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EXTRACT

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SECTION 11. The Librarian shall cause to be kept a register of all books issued and returned; and all books taken by the members of the Legislature, or its officers, shall be returned at the close of the session. If any person injure or fail to return any book taken from the Library, he shall forfeit and pay to the Librarian, for the benefit of the Library, three times the value thereof; and before the Controller shall issue his warrant in favor of any member or officer of the Legislature, or of this State, for his per diem, allowance, or salary, he shall be satisfied that such member or officer has returned all books taken out of the Library, by him, and has settled all accounts for injuring such books or otherwise.

Sec. 15. Books may be taken from the Library by the members of the Legislature and its officers during the session of the same, and at any time by the Governor and the officers of the Executive Department of this State who are required to keep their offices at the seat of government, the Justices of the Supreme Court, the Attorney-General and the Trustees of the Library.



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MINING AND SCIENTIFIC PRESS

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SAN FRANCISCO, SATURDAY, JANUARY 4, 1873.

VOLUME XXVI.
Number 1.

The Coming Expositions.

In our issue of Dec. 21st we gave a notice under the above head, of the Vienna and Centennial Expositions, but neglected to mention either of the following which will come off this year.

The London International Exhibition of 1873 Will be the third of the series of annual international exhibitions of selected works of fine art (including music), industrial and recent scientific inventions and discoveries, under the direction of Her Majesty's Commissioners for the Exhibition of 1851. It will be opened at South Kensington, in London, in April, 1873, and closed in October, 1873. The productions of all nations will be admitted, subject to the decision of competent judges as to their being worthy of exhibition, and provided they have not been exhibited in the previous exhibitions of the series. The exhibition is separated into three divisions: Fine arts—applied or not applied to works of utility executed since 1863; manufactures—machinery, substances and processes; recent scientific inventions and new discoveries of all kinds. Shafting, power, glass-cases, stands, fittings, etc., will be furnished free of cost, if Her Majesty's Commissioners are notified before the 31st of January, 1873. America excels in some of the branches of manufactures which will form the industrial portion of this exhibition, notably in food productions and the application of machinery to the making of carriage wheels.

The Society for the Encouragement of Arts, Manufactures and Commerce, offer three money-prizes for the best cabs which are to be exhibited at this fair. It must be certified to that these vehicles have been in practical use for three months before the delivery—the first Saturday in April. The defects in the vehicles now are want of room, seats too high, difficulty in getting in or out on account of steps and large wheels, window-opening arrangements, want of ventilation and locking of wheels on four-wheelers. Here is a chance for inventors to make a fortune.

The Metropolitan Intercolonial Exhibition of 1873

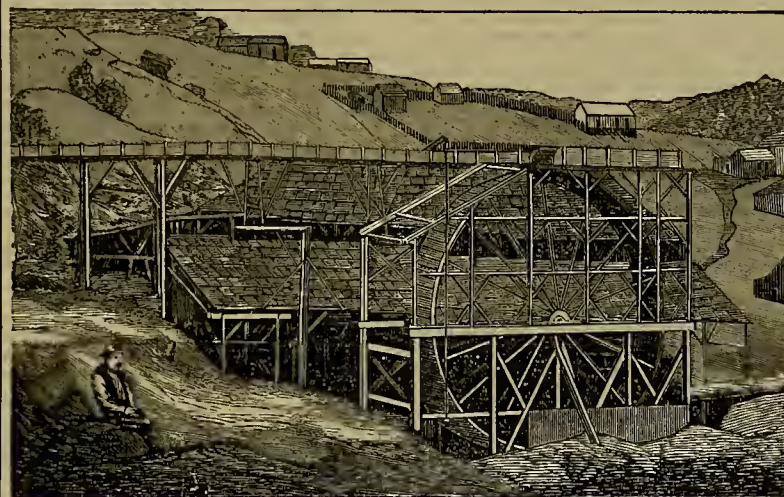
Will be held at Sydney, New South Wales, commencing April 22d, 1873. The Agricultural Society of New South Wales has been in communication with the Mechanics' Institute of this city, asking us to be represented there, as the products of California are analogous to theirs, and it would be interesting to see them competing with one another. For them to receive implements and manufactured articles would, no doubt, be conducive to business orders to a great extent, since at the close of the exhibition a sale of exhibits is to be held.

The show is said to bring into town some 150,000 people from the interior, and the prices realized by the goods thus disposed of and the orders taken for further supplies of the same are sufficient to induce all the Australian Colonies to join in the exhibition. The prizes for wines are elaborate as are those for horses, cattle, sheep, goats, poultry, dogs, wool, etc. The non-agricultural departments comprise articles which have originality; utility in the highest degree; the representation of some process, manufacture, invention or discovery likely to be of special advantage to the colonies. It is to be hoped that the manufacturers of California will extend their reputation by sending their products to this exhibition. Our foundries in particular would do well to send samples of mining machinery, pumps, etc., as it would no doubt be of benefit to them.

DAM BURST.—The dam of the immense water reservoir of the Spring Valley Mining Company, located a short distance from Oroville, was broken on Saturday morning by the heavy rains of the past few days, and its gates, flumes, and other property within the reach of the avalanche of water were all destroyed. The work is stated to have cost \$80,000, and the reported loss of the Company is from \$50,000 to \$60,000. The accident, and especially at this season of the year, is very unfortunate for the enterprising mine owners.

The First Quartz Mill in California.

The two cuts shown on this page represent the stamps of the mill of the Keystone mine, Amador county, California, and the old mill, as it originally appeared. We have been told that this was the first mill ever built in this State,



THE FIRST (?) QUARTZ MILL IN CALIFORNIA.

but this appears to be a disputed question. Some parties claim that the first one was built in Tuolumne county; others that it was in Calaveras county; others in Grass Valley, and others again say that it was erected in Amador county. We had the engravings made to show the appearance of this old mill, with its water-wheel, etc., and also to show the appearance of

ponnds, requiring 25 tons of melted metal, allowing for waste, finishing, etc. It was at first supposed that it would be necessary to have the casting made in the East but the Risdon Iron Works concluded to undertake it notwithstanding the necessity of new tools, etc., for this immense piece of work. A new pit was made and a crane of 20 tons capacity, with pat-



THE SAME WITH IMPROVED BATTERY.

terns, cones, moulds, etc. When tried the cylinder will be 105 1/2 inches in diameter inside and 13 feet 8 1/4 inches in length. One week will be required to cool the metal and several weeks more to bore and finish the cylinder. It is expected to be in its place ready for work in the steamer in two months from the signing of the contract.

THE OLD YEAR.—We cannot say the old year sleeps, for it is dead! May we not hope, that all that transpired of evil during its life, died with it, bequeathing only goodness and happiness to the young New Year.

A Monster Casting.

At the Risdon Iron Works, in this city, the largest piece of casting ever made on this coast was perfected on New Years day. It was a new cylinder for the Pacific Mail steamer, Arizona. The cylinder in the rough weighs 43,000

jobs will be undertaken here, and we hope to see all steamship work of every description given to our local foundries instead of sending away from home for it. The Superintendent of the Risdon Works is Joseph Moore; Robert Raphael is foreman moulder. The foremen in charge of this special piece of work were Edward Jones and A. R. Wilson.

A New Volume.

The present number marks the commencement of the twenty-sixth volume of the MINING AND SCIENTIFIC PRESS, and we may be pardoned for alluding to the fact that it has now attained an age and importance which has given it a high position among the class journal of the country, whether on the Pacific or Atlantic side.

The plan on which it is conducted is evidently popular with its readers. The arrangement of the matter of the paper into departments, so that the reader knows just where to turn for any particular class of information, enables him to more easily comprehend and arrange in his own mind the information contained in each successive issue.

The great object of the paper is the diffusion of useful information, more particularly among miners and mechanics, and by a constant and regular perusal of its columns, more valuable and practical knowledge can be obtained by such readers than from ten times its cost in books or other publications.

In commencing a new volume we have but to repeat our assurances of continuous effort. No means will be left untried to secure, at the earliest moment, every class of information new and important to the miner and mechanic, and we are determined to do all we can to render the present volume more valuable to its readers than any preceding one.

Our correspondence will be more extended. Mr. A. B. Paul has promised that our readers shall hear from him every month; "L. P. Mc." still remains with us; we are promised correspondence from Vienna, from Mr. Knstel, the California commissioner. We have made special arrangements for an interesting series of articles on hydraulic deposits and mining, which will be accompanied with appropriate illustrations. We shall commence, next week, a series of articles on mining geology, descriptive of the manner and occurrence of gold, silver and other minerals on this coast, prepared by Amos Bowman, Esq. Mr. Hanka has also promised us a series of articles which will be found of special and practical importance to our mining readers. More critical attention will be paid to the mining summary than heretofore.

We commence this week the publication, from the New Code, of all the California laws relating to mining and mining corporations, which we shall also issue in pamphlet form, for more general circulation and more convenient reference. The market reports will hereafter receive increased attention, and be more fully reported.

NEW INCORPORATIONS.—The unusually large number of incorporations this week is a noticeable feature; the majority of them are formed for the purposes of mining as will be seen by the list published in another column. This is the largest list we ever recollect having seen in one week, much larger than at the time of the excitement in stocks at the beginning of last year. By forming the companies in December, the provisions of the New Code are avoided, as it came into effect on the 1st inst. Now ten per cent. of capital stock must be paid up.

MISCELLANEOUS.

Practical Uses of Geology.

The object of geological investigations and the general result of such inquiries being understood, it remains to consider the various modes of its application to practical purposes in useful detail, so that we may clearly prove that this science, which not long ago amused the public mind, and alarmed the timid with vague speculations and unfounded theories concerning the origin of things, now involves much that is necessary to be known, and has become an essential part of sound education; being, in fact, so important to the engineer and miner as astronomy is to the navigator. Since, however, it is the case that geology embraces a wide range of subjects, some of which bear more directly on the natural history of living and extinct races of animals and vegetables, while others are more strictly mechanical,—and that the latter are those chiefly concerned in the practical application with which we have to deal,—a very brief summary of such facts may be useful in entering on a new department of the subject. It will appear, on a little consideration, that the facts in question are of very distinct kinds, and may be considered separately; for we may regard the earth's crust either as the place upon which, or within, various operations are to be performed, or we may regard it as the great depository of all useful and valuable mineral substances, of whatever nature. Thus the agriculturist will regard the earth and the rocks present in his district as providing the soil, and supporting the plant mechanically; but he may also look for valuable minerals to mix with his soil on the surface, and may be obliged to consider what hidden but determinable facts will interfere with or assist his draining.

So again, the architect and engineer will require to dig in some places for stone and clay, in order that they may erect some structure in another place, where it is important that the foundation should be sound, and where no unusual difficulties need be anticipated. And so also the miner, while he is merely anxious to extract mineral wealth, must also regard and carefully estimate the difficulties he will have to contend with, while piercing to great depths beneath the surface, or hurrying to a distance within a hill. Now in order to understand the application of geology thus presented, it is necessary to be familiar with certain principles and facts, relating chiefly to those masses of matter already described as rocks, and concerning which it is important that the practical geologist should know both their mechanical and chemical condition, and their mechanical position. Such facts duly appreciated, and the basis of geological science once laid, it is useful to notice how completely, not only the earth structure but the habits and even civilization of its inhabitants, corresponds to this geological condition. Thus in our own country it has often been observed that the inhabitants of the mountain districts differ much from those of the plains, while those of the lowlands vary according to the nature of the underlying rock, because that influences the cultivation. The geological structure and configuration of any country are the main foundations of its physical aspect; and the various operations of elevation, depression, and denudation, which it is the object of the geologist to study, are in effect the cause of all modification of the aspect and structure as originally impressed. Thus the mere fact of a line of hills in a country or a district, sloping gradually on one side and much steeper on the opposite side—or elsewhere, of hills rising regularly and with monotony—will of itself mark the physical cause of such appearance, whether it is due to a distinct elevation, or to the outcrop of some hard bed. Wherever distinct and definite physical features occur, some geological cause may always be traced; and on the other hand, every important geological event that has last happened in a district, is indicated by physical features.

A knowledge of this is often extremely useful to the traveler; for in this way he may determine the probable direction, or even the possible existence of rivers and mountain ridges, and also the places where natural mineral riches are likely to be found. The nature and use of geological maps and sections—of which many and excellent examples are produced by the geological survey, may also be recognized in their application to important practical questions constantly arising in agriculture, agricultural engineering, architecture, civil and military engineering, and mining. Each of these pursuits and professions having reference to material obtained from the earth, and also to the earth as the basis of operations, involves many facts of direct geological interest. It is only by a knowledge of geology, and of the mode of applying such knowledge, that much progress can be made in the higher and more suggestive departments of these sciences, and will not be considered that there has been any unnecessary consideration of details in what has been said concerning the nature of rock masses, their chemical composition, the mode in which they were aggregated, and the changes they have since undergone. These facts being the foundation of practical geology, are in every way worthy of careful consideration, and cannot be to well understood or too often

thought of by practical men. Whilst the application of geology to agriculture, engineering, and mining, are direct and immediate, and requires each in its turn the careful attention of the student, there is one other less manifest but equally connected with this subject, that may be regarded as preliminary. It is not alone to mechanical arts and appliances that the study of nature is essential. It is equally so to those who would represent the varied physiognomy of nature in its rocks and mountains, hills, valleys, and plains, and who for this purpose learn the arts of drawing and painting, and apply them to represent the forms and colors that please the eye and instruct the intellect. The artist as well as the engineer, and the critic in art as well as the artist, require knowledge and science, that the one may produce, and the other recognize and appreciate, a true transcript of nature.—*Anstead.*

Klamath River Mines.

Remarkable Gravel Deposits of the Lower Klamath—A Sketch of their Geology.

The upper portions of the Klamath River and its tributaries, the Trinity, Salmon and other streams, have long been the scene of active placer and hydraulic mining. But little attention has, however, been given, up to this time, to the remarkable deposits on the main river, toward its mouth. This is partly owing to the fact that about the time prospecting had commenced in the section, the silver excitement drew off the restless spirits who perform the pioneer-work in all mineral development. Being off the regular routes of travel, and not easily accessible from stage or steamboat lines, and, in addition, being the home of Indians alone, few white inhabitants being found for many miles above its mouth, the gravel deposits of the lower river have remained unnoticed—almost untouched—while others, in different portions of the State, were being actively worked, and, as a rule, paying the owners better than any other class of gold-mining. To be geologist, however, and the practical miner, these deposits offer a field of interest and profit second only to the famous blue gravel mines, which they resemble in many particulars.

Geology of the Deposits.

It is probable, however, that they are not the deposition of an ancient river, but that of the present stream, under different conditions from that now existing. In order to present a theory of their formation, it is necessary to take into account the character of the river and underlying rock-strata through which it has cut its way. The Klamath drains an immense extent of mountainous country, through which passes the great auriferous belt of California, as evidenced by the rich quartz-lodes and placer mines on the tributaries. Being a swift and deep stream, great quantities of water-worn gravel are swept down by the resistless floods of winter. These form at present as gravel bars, increasing in extent towards the mouth, all more or less auriferous, and their presence can be easily accounted for. A remarkable distinction should be noticed here. A remarkable observer who has watched the action of the surf rolling up pebbles on a sea or lake beach has noticed that the shape assumed by the stones is that of a sphere, the grinding action being equal on all sides. On the contrary, the gravel worn by river action alone will be flattened or oblong in shape, the continuous flow of the river being in one direction and the gravel wearing more rapidly on one side than the other. Hence, when deposits of water-worn gravel, flattened rather than rounded in shape, are found four and five hundred feet above the present level of the stream, one must seek some other solution than that of present action, as no flood, however great, could have piled up these masses of gravel.

How the River has Worn Down its Bed.

This solution can be found on observation of the rock strata forming the river bed and cropping out on the sides. Commencing at the mouth of the stream, one will notice that this strata consists of ledges of metamorphic sandstone of an exceedingly hard nature, and that it continues to appear for about fifteen or twenty miles as you ascend. In this section, although the gravel bars formed by the present by action of the river are frequent, yet no old deposits are found on the banks. At the end of this stretch of fifteen or twenty miles, the character suddenly changes. A soft micaceous slate now appears dipping at an angle of 15 degrees to 45 degrees against the stream. This gradually rises as you proceed up the river until at a distance of thirty miles from the mouth it is seen cropping out many feet above the level of the stream. It is in this portion that the great banks of gravel appear on the sides. On investigation of the causes that formed them, one is instantly struck by the fact that they are invariably found above and below a rapid or fall in the river, and that the bed rock at these rapids is a hard talcose slate or serpentine. This vein can be seen on the sides of the river also, and suggests a theory. It is that the river, which now has a fall of 234 feet in the thirty miles from the deposits to the mouth, was at one time many hundreds of feet above its present level. Wearing away the soft slate it has met with an obstacle in the dykes of serpentine forming their lofty waterfalls. Here the gravel was deposited, in the still reach above the eddies below. Gradually the action of the water has worn away the serpentine, until, what was perhaps a thousand years ago a

great fall, is now a rapid, over which canoes can be taken. That this is the case, evidence in point is offered by a celebrated and once dreaded rapid, called the Mereep, about 34 miles from this mouth. Within the memory of the oldest white inhabitant of the river, the Indians were accustomed to land at the foot of this rapid and haul their canoes over the bank as the fall was too great to stem going up, and dangerous to run going down. At the present time no difficulty is experienced in poing up or in peddling down. As the river cuts its way down, it also changed its course, perhaps many times, so that the deposits are now on one side then on the other of the present bed. Opposite the gravel beds is usually a bare mountain of rock, rising abruptly from the stream.

Origin of the Gold Bluff Formation.

It is said by some of the old prospectors that, starting at the point where the sandstone formation commences, the gravel can be traced through the mountains, good prospects being found even on the summits and that it finally ends in the immense cliff known as the Gold Bluff, 25 miles below the present mouth of the Klamath. The spot, the scene of one of the early excitements, is at the present time the theatre of active beach mining operations.

The sea having for ages performed the part of an hydraulic mining pipe has washed down the gravel bluff and separated the black sand, the gold now being gathered from it when the heavy gales of winter throw it up on the shore. However, this assertion, in regard to the continuation of the gravel through the mountains may be, the writer is not prepared to affirm from personal observation.

Description of an Auriferous Stratum.

Of the deposits on the river one will serve as a sample. This is located about thirty miles from the mouth, and the cut into the hill is 384 feet above the stream and some 500 yards away. The surface bank exposed is about 100 feet, and shows alternate strata of gravel and sand. The bed rock is the same soft slate seen along the river, and is worn into pot-holes and grooves by the old eddies. Above this is a stratum of blue gravel (so-called), decomposed talcose slate, in reality, most probably the wearings of the dykes before referred to. The stratum is from five to sixteen feet in thickness, and is of course the richest. Above it a reddish or yellow river gravel mixed with sand, and an occasional streak of oxide of iron forming a soft cement.

This entire bank of gravel, as prospected by washing out pans-full from each layer, showed gold at the bottom of each pan, or what is called a color. In the stratum of blue gravel the gold was rather coarse and the pieces flat or oblong in shape, averaging something like two or three cents to the pan. This claim is now in successful operation and will doubtless repay its owners handsomely for the labor expended on it, as they have an abundance of water and a great fall for tailings.

Advantages for Hydraulic Operations and for Settlement.

Were, however, the most improved methods in use in Grass Valley and elsewhere, to replace the rude manner in which this and other of these deposits have been and are now being worked, it is believed that their product would soon attract great attention, as the gold is remarkably pure in character. The climate in the vicinity of the mines is very different from the coast, being hot in summer, with long, rainy winters, but no snow. Peaches, melons and tomatoes will ripen and arrive at great perfection, which they will not do on the coast line.

The gravelly soil seems to be especially adapted to the grape, which grows thrifty and ripens early.

In the vicinity of these deposits are also found fine groves of cedar, sugar pine and redwood, which, in time, when mills will be erected, will furnish an abundance of lumber for mining purposes. Now that the new mineral law allows acquisition of titles to mining property, it is to be hoped that these deposits will receive more attention from our miners and prospectors than they have hitherto done, and that they may add another element to the rapidly increasing mineral wealth of our State.

MINING FOR TIN.—There seems to be a reality in the Australian tin mines, as we read that 51,000 acres of tin-land, taken up bear an annual rental of \$60,000. Some of this land covers and pays rental in consideration of copper mines, but by far the greater portion is set down as "tin selections." The lands are in New South Wales, and the reports speak of very large discoveries.

We hear a good deal, from time to time, of the shaky condition of the Cornwall mines, and how they are to see their best day in consequence of some new finding of tin in other countries. They manage, however, to maintain what is sometimes called a "visibility," though their profits are set down as a very small item, out of all proportion, however, a Californian would think, to their reported values. For instance, the Grenville is valued at \$250,000; Treligh Wood, \$750,000; Van, \$3,000,000; Roman Gravel, \$1,000,000 and East Slanguoy \$1,000,000. Seventeen other mines are set down as worth from \$50,000 to \$60,000 each.

The values will probably be kept up until other valuable discoveries are made, which give native promise of furnishing the needed supply of this metal at a price much below that at which it can be produced at the deep and low per cent. mines above referred to.

Another "Ancient City."

Col. W. T. Roberts, who recently went down to Arizona, hunting for diamonds, etc., reports the discovery of the ruins of an ancient city, which covers an area of about three square miles. It was enclosed by a wall of sandstone neatly quarried and dressed, ten or twelve feet thick, and which, judged by the debris, was fifteen or twenty feet high before its fall. In most places it had crumbled away and fallen, and was covered with sand, but in many places it was still standing six or eight feet above the sand-banks which had drifted around it. The entire area inside of this had at one time been covered with houses, built of solid sandstone, which showed excellent masonry in their construction. This ancient city is situated in Arizona, about ninety miles from the boundary line between Utah and Arizona, and the same distance from the western Colorado line. It has the appearance of being an old Aztec city that has been deserted for hundreds of years and fallen to ruins. It is entirely of stone, and not a stick of worked timber is to be found among the ruins. Nothing but the walls are standing, and none of them now are left more than eight or ten feet above the sand, which is eight or ten feet deep. The walls still bear the traces of many hieroglyphics, cut deep into them, showing various Indian customs and superstitions. There are also the ruins of stately monuments, built of square block sandstone, well quarried and showing good masonry, which are worked with notches and crosses cut into them at regular intervals.

The city is covered with sand, which it is thought has blown there from the desert. The sand has become solid and packed by the rains. Under the sand is a layer of blue clay, six or eight feet deep. No bones, implements or relics of any kind were found, with the exception of some pieces of pottery of dark color. These were embellished with paintings of flowers and ornamental figures in blue colors. The coloring matter is of a blue mineral substance of some kind. It is perfectly indelible, and pieces of pottery which have been exposed to storms, which have worn away the solid masonry of the walls of the city, show their colors as fresh and bright to all appearances as when new. The pottery itself has been found to be perfectly fire-proof upon trial in crucibles and furnaces.

STREET CAR TRACKS.—Much complaint is made of the obstructions to ordinary travel presented by the street car tracks of this and other cities in the United States. The most or all this objection could be avoided by the adoption of the English form of street car tracks. The car tracks in London consist of a flat strip of iron, with a groove for the flange of the wheel to run in. The rail is not sunk, but laid exactly level with the surface of the pavement, thus presenting no obstacles to ordinary vehicles. The cars are constructed with outside seats as well as inside. If the plan of track described works well in London, why will it not also answer for San Francisco?

THE REPORTED CHICAGO GRAIN FRAUDS.—Some of the Chicago papers are demanding that the grain stored in that city be weighed so as to ascertain the exact amount, as it is believed by many that the quantity stated as stored does not exist, except on paper. It is stated, that one railroad has reported 100,000 bushels received, while the Inspector claims that not one-tenth the amount actually came into that city over that road. Also, that the weekly statement shows an increase, while the total additions of receipts and exports show a decrease.

THE LAKE SUPERIOR TIN DISCOVERIES.—The *Perlaye Lake Gazette*, of a late date, says:—The unaccountable mystery that has surrounded the claimed discovery of tin upon the north shore of Lake Superior, and the inevitable relations that have existed between the discoverer and certain parties to whom he had sold interests, will, it is believed, soon culminate in certain knowledge of either the worthlessness or the value of the find. A party of gentlemen representing large interests in the property, together with several experts and press representatives, started last week with the original discoverer, who proposes to fully satisfy them of the genuineness of his claim.

The nickel mine in Lancaster county, Penn., from whence the nickel for the United States coinage is obtained, has been worked for seven years, and developed to a depth of two hundred feet. The length of the lode is between two and three thousand feet, and it produces from four hundred to six hundred tons per month, employing in the working of the mine a force of one hundred and seventy-five men. One mine, the Mine la Motte tract, Missouri, was worked from 1850 to 1855. About \$100,000 was realized from the croppings of the vein. Croppings of nickel ore are found also in Madison, Iron and Wayne counties, Missouri. The refined metal is worth \$3 per pound.

MECHANICAL PROGRESS.

Bessemer's Steady Ship Saloon.

The saloon devised for use on Mr. Bessemer's Anti-Seasick Channel Boat is said to be a marvel of mechanical ingenuity. A saloon floor of working size has been constructed and put in operation near his residence, in connection with a mechanical apparatus which is said to impart to it all the motions to which it would be subjected within a ship's hull, and in a heavy, chopping sea. The visitor, when he steps upon the improvised deck, if at all liable to such sensations, soon becomes subject to all the phenomena of sea-sickness; while if he enters the "saloon" he feels no disagreeable motion, or none at least which will produce sea-sickness. The *London Times* describes the device substantially as follows:—

Looking into the functions to be performed by this governing mechanism in the proposed ship, we first have to suppose a large and strong floor, which, at its ends and at two intermediate points of its length, rests on steel axes, of about the diameter of the driving axle of a locomotive. The supporting frames are securely fixed to the double bottom of the vessel. This floor, then, is capable of a motion like the beam of a pumping engine. By raising the sides of the floor and covering it in with a roof it forms a saloon, and if as much dead weight be placed below the beams of the floor as will counterbalance the upper part of the structure the saloon will be in a state of equilibrium and capable of motion on its axis. In this condition it is liable to be put in motion by the movement of passengers or by the force of the wind blowing against the upper part.

Hydraulic power being here judiciously applied prevents any such erratic motion, and affords a means of retaining the saloon in a vertical position at the will of the man operating the apparatus, notwithstanding that the vessel in which it rests is moving beneath it. In order to effect this end a toothed sector of large diameter is secured to the main central axis of the structure, and beneath it is a strong bed plate firmly attached to the floor of the ship. On this bed plate are two hydraulic cylinders, to which a double-ended ram is fitted, the central part of the ram being provided with teeth, which gear into the sector. Therefore, when the ship is in a state of rest, the sliding in and out of the rams will cause the saloon to move on its own axis with a gentle but powerful motion. These movements, however, are controlled by a pair of delicately balanced equilibrium valves.

Hence, it will be seen that when the ship is rolling at sea the power of acting on the saloon enables the steersman to retain the saloon constantly in a perfectly vertical position, while the floor of the ship rises and falls beneath it. The essential point of this very ingenious arrangement is that the hydraulic apparatus has not to put the saloon in motion, but simply to prevent it acquiring any motion. Moreover, the *vis inertiae* of a structure like the saloon, which will weigh some 70 or 80 tons, will greatly assist in resisting the initial tendency to motion.

In other respects Mr. Bessemer's saloon offers undoubted advantages. Resting, as it will, on four axial supports bedded on an elastic packing of large area, it will be completely insulated, and will not be susceptible to the violent tremulous motion imparted by the engines and paddles. Again, the heavy thud of the sea against the sides of the ship, so objectionable in cabins built against the framing of the vessel, will be wholly unfelt, as there will be a space of five feet between the saloon and the sides of the ship, from which, in fact, it will be totally disconnected. Before long the merits of the invention will be put to the test in a couple of vessels built from Mr. Reed's designs, and it is the opinion of all who are competent to form one, that in them Mr. Bessemer will find his expectations fully realized.

The invention is an ingenious application of well known mechanical principles, wherein hydrostatic force in transmitting power and in regulating the irregular action of the machine forms an interesting and most essential feature. Mr. Bessemer has already manifested much ingenuity in his various applications of hydrostatic force; but if we except this new application, perhaps, the most remarkable of all the various purposes for which he has introduced hydraulic apparatus is its application to the movement of the large converting vessels used in his steel manufacture. These vessels weighing from 10 to 20 tons are under the absolute control of a boy placed 60 feet above them, when by means of a simple handle he can alter their position to the fractional part of an inch, or move them entirely around a circle, although their fluid contents—to say nothing of the weight of the converters themselves—of five tons, are constantly changing their balance.

With this successful appliance in mind, it is easy to perceive how readily Mr. Bessemer might control the unwieldy and irregular movements of even such a mammoth thing as a 70-foot steamboat saloon, loaded with a full complement of passengers.

Resistance of Building-Stone to Heat.

The great fires at Chicago and New York have attracted much attention to the relative values of different kinds of building-stone in resisting the heat generated in great conflagrations. Mr. Wight, after the Chicago fire, carefully collected such facts and evidence as seemed most pertinent to this question, and embodied the same in an address before the American Institute of Architects, at Boston.

It is stated that in the Chicago fire none of the limestones stood the test of heat; but some were worse than others. The Illinois limestone "was, in very many instances, entirely calcined." "With regard to this stone," says Mr. Wight, "it was a common thing for it to explode when the heat came suddenly upon it and was very intense. It seemed to calcine with great rapidity, and I suppose the effect was very much like that seen in the manufacture of popcorn."

The limestones used for building consist essentially of carbonates of lime, or of carbonate of lime and magnesia—the latter being known as dolomite. When limestone is exposed to a red heat, the carbonic acid is driven off and the stone crumbles into "burnt lime." Limestone free from magnesia, however, will stand a much higher heat than the dolomite—the latter crumbling at 600° Fahr., a temperature which leaves the former intact. Mr. Wight speaks of the so-called "petroleum stone," which was reported to be entirely consumed, but which, in fact, stood the heat very well. There was one church in Chicago built of this stone, in which the amount of oil was so great that the heat of the sun would draw it out soon after the stone was set up in a wall, and it would run down in black streaks. "The effect of the heat on the inside of the walls threw out upon the exterior all the oil it contained, which formed a thick, hard coating, about a quarter of an inch in thickness; and though the interior of the church was exposed to great heat, and every particle of wood in it was burned up so that there was not a scrap left in it, the interior sides of its walls were not greatly injured. In some places the stone had flaked off, and yet this stone stood the test better than any other natural stone used in the city."

The great resistance of this stone to the heat was not, of course, due to the oil which it contained; but to the fact that, though called a limestone, it really contained from 20 to 30 per cent. of silica and alumina, which substances, the latter in particular, are distinguished for their capacity to resist heat. Their presence, intimately mixed with the lime, protects it from disintegrating. The oil on the interior of the wall was protected from burning from the fact that the interior of the building was inaccessible to the free entrance of air.

Sandstones stood the heat best at Chicago, and proved the excellence of that material for fire-proof structures. The only building in the burnt district of the south side at Chicago, which stood intact, was of Cleveland sandstone. "In that building there was not a flaw, nothing cracked or broken." Sandstone is made up of from 80 to 90 per cent. of silica, the balance consisting of alumina, lime, magnesia, iron, etc. The oxide of iron is usually the cementing material.

Granite, quartz, slate, and most other rocks of that class used for building purposes, are liable to crack, oftentimes in an explosive manner. This is due to the fact that they contain a considerable quantity of water, mechanically held within their interstices. Quarrymen and miners will often, on examining the walls of such rocks immediately after blasting, notice that they are more or less moist—the moisture being sometimes so great as to collect in drops and even run down the face of the recent fracture. This moisture is retained in building blocks, and when great heat is applied, being converted into steam, causes explosions, as above. Sandstone is quite free from moisture; hence, chiefly, its power to resist the action of heat.

Artificial stones, composed of silicate of lime and alumina, with water chemically combined—not mechanically enclosed—are of the nature of sandstones, and are well-calculated to resist heat. It is said that large numbers of the Frear stone blocks which passed through the Chicago fire, and which do not contain any free water, are being used the second time in the construction of other buildings.

Bricks, if of good quality, resist the action of fire very well. If they contain material which vitrifies readily they lose their strength and succumb. True, they absorb water easily, but they part with it so readily that no danger ensues from that cause. When good bricks are built into a wall of proper thickness they form about as indestructible a material as can be used for resisting a great heat.

We have not as yet seen any report upon the particular and comparative effect of heat upon the stone and brick material subjected to the heat of the recent Boston fire. Careful observations have no doubt been made, the results of which will doubtless ere long find their way into print. Quite too little attention is paid by builders and architects to the heat resisting capacity of the stone they use. More attention is paid to the crushing strain which it will bear and the facility with which it may be worked. Mineralogy and chemistry are quite as essential to the architect in determining the selection of his building materials as is the hydraulic press.

SCIENTIFIC PROGRESS.

Experiments in Nature's Laboratory.

The experimental method, now so universally accepted as the sole means of arriving at scientific facts, is mostly carried out in laboratories provided with more or less expensive apparatus, which, however large and commodious, rivals in a pitifully small degree the grand, subtle, and delicate appliances of nature. No artificial arrangements can emulate the enormous pressures to which in nature various materials are subjected. No furnace constructed by man, though seven times heated, can approach in intensity of action the heat of volcanic origin; and this last is, so to speak, cold when compared to the high temperatures of the solar atmosphere.

What comparison can be made between all the varied and skillfully contrived apparatus of modern chemistry and that which exists in the respiratory, digestive, and circulatory organs of animals, or even plants? Not all the instruments and processes yet devised by man for investigation of organic chemistry are equal to the construction of a blood-corpuscle, a cell, or an animal tissue. We know that these things are produced in obedience to law, as surely as that winds blow, iron rusts, and rivers flow in accordance with fixed and invariable principles. Could we establish the proper conditions, a blood-corpuscle would result.

The feeble experiments of the philosopher are merely attempts to establish in each case a determinate set of conditions. This done, he awaits results. It is only through the agency of natural law that he establishes conditions, he himself acting in as blind obedience to law as does the cloud from which he culls a specimen. He even thinks in obedience to law, from which he can no more escape than matter can escape from the mysterious influence called gravity.

People often speak about violating a law of nature, and of the punishment which follows such violation. The fact is, however, that there is no such thing as breaking through natural law. If we eat that which nourishes us, we are nourished according to law. If we take arsenic, it acts to poison us in obedience to other provisions of the same inexorable code. Tobacco entails nervous and other disorders upon man, when used as a stimulant, under the same law that it kills ticks on lambs. Nature is perfectly indifferent whether a flame burns sticks or our fingers. It is the eternal fiat that gases heated to incandescence shall produce certain effects on certain other substances, and neither sticks nor fingers can evade the everlasting unchangeable decree. Underlying the ever-changing complexity of phenomena is the never-changing, inflexible, sternly coherent law, so much superior to the puny will and strength of man that one wonders at even the careless application to it of the term "violation."

It is questionable whether, in the search for artificial appliances through which to control conditions, we have not in some measure come to underrate the value of close observation of results of conditions already established in nature.

It is quite recent that we have learned to appreciate the possible effects of winds in abrading rocks exposed to their action. The artificial application of the sand blast to the cutting of the hardest substances within the last two or three years is only a repetition of a process which has been going on under the eyes of mankind for ages.

Who has ever thought of consulting any of the processes going on in the natural world for confirmation or negation of the elementary character of those substances now called chemical elements? Who has said, "Inasmuch as the chemical processes of digestion and assimilation are infinitely more refined than any I can conduct, let me see whether in the animal or vegetable economy phosphorus or sulphur (which are, to say at least, open to the suspicion of compound character) is not sometimes produced from food which contains neither?" Should such a fact ever be discovered, it would as effectually settle the composite character of phosphorus or sulphur as could the most successful laboratory analysis.

All honor to the splendid corps of investigators—now, thank God! in no want of recruits—who are forcing their way into the interpenetration of nature in schools, in laboratories, in shops, and in garrets! All honor to the genius that has given us the balance, the thermometer, and the barometer; that has widened our field of vision by the microscope, the telescope, and the spectroscope! All honor to him, though the humblest, who has added one implement to our common stock! Yet, with due reverence to genius we believe there is something to be seen with unaided eyes, and outside the laboratories and observatories of our universities.—*Am. Artisan.*

NICKLE AS A GAS OCCLUDER.—Prof. Raoult of Grenoble, has proved that nickle employed for twelve hours as a negative electrode in a voltameter, condenses at least 150 times its volume of hydrogen and abandons entirely this gas, when it is taken from the voltameter and plunged in water. M. Raoult has made several experiments on the production of caloric and has succeeded in demonstrating that the intensity of the heat developed by an electric current is independent of the system of battery by which the current is engendered.

Heating Water Above the Boiling Point in Open Vessels.

M. Donny, a French experimentalist, found that water deprived of air could be raised to a temperature of 230° Fahr., without boiling, and that evaporation then took place explosively, the water discharging a sufficient amount of steam at a single burst to reduce its temperature to that due the pressure to which it was exposed. M. Deluc observed the fact even earlier than Donny, and physicists have attacked the subject since.

M. Dufour, by taking the most delicate method and observing the greatest care to avoid contact of rough particles and metallic surfaces with the water, succeeded in raising the temperature of very minute globules 347° Fahr., which is that due to steam under a pressure of 115 pounds to the square inch. It is found necessary, however, in such experiments, to operate with very clean water in very small quantities, and to be exceedingly careful to avoid the slightest motion of the liquid, and also to keep it from contact with metallic surfaces or mineral substances.

M. Donny's experiments were made with glass vessels, but M. Dufour was compelled to suspend his drops of water in a mixture of oil of cloves and linseed oil, to secure the success of his experiment. Such conditions evidently never occur where water is vaporized in steam boilers, and we may probably feel confident that such superheating is not likely to produce steam boiler explosions. The mass of water in a steam-boiler is too large, and is invariably in contact with a metallic surface. It is probably always in motion, at least, to a slight extent, as the irregular distribution of heat in all ordinary boilers, must produce generally some slight circulation at all times; and finally it rarely happens that feed water is absolutely free from impurities. While, therefore, we cannot say positively that explosions have never occurred, from this cause, we are fully justified, probably, in supposing it to be the fact.—*Scientific American.*

Origin of Storms.

Mr. John Hepburn, of Gloucester, N. J., writes to the *Scientific American*, that a careful observation of twelve years past has satisfied him that "storms are nursed into being by the action of electricity from the sun, and that the rays of the sun drives the storms before them." He says: "I have made a specialty of watching the first traces of gust march, and I have invariably found that morning gusts come from the east; mid-day gusts from the south and evening gusts from the west, and I feel quite sure that if scientists will devote a little time to the first appearance of any coming gust, they will find and admit that there is truth in the theory I have advanced. I am of the opinion that solar electricity produces earth storms, and that most earthquakes are produced by the same agency."

He has noticed that black, stormy clouds advance from the sun, pass on beyond, or make a stand overhead, and in the latter case mix more and run into each other in very great commotion; then begin to break and act with fearful violence upon the earth, sending torrents of rain or hail in an opposite direction to that of its original march. He has also noticed gusts come up, along through the clouds, pass overhead, and for some distance beyond, then return against or at a greater or less angle to the sun's rays. What he appears to claim as his theory is, that the gusts are first set in motion in a line with and before the sun's rays; but that when once so put in motion the cloud thus formed may be driven more or less out of its direct motion by side currents, before it commences to discharge its aqueous contents, or otherwise expend its accumulated fury.

"GUMMATE OF IRON" PAPER.—Many years ago Fremy discovered, very unexpectedly at the time to the chemical world, that gum, instead of being, as previously held, an isomeric form of starch or cellulose, was the lime salt of a peculiar acid, gummic acid. The *British Journal of Photography* states that, very curiously, gummic acid combines with ferric oxyd, forming what may be called an iron gum. To coat paper, which is then sensitive to light, "a solution of perchloride of iron is taken, ammonia cautiously added with agitation until a permanent precipitate makes its appearance. The liquid then filtered, paper saturated with the solution, and allowed to dry in the dark. The coated sheets then floated on some thick mucilage of gum-arabic. The surface of the paper is thus covered with an even layer of the "gum-mate of iron." When the paper carrying the iron is first coated with the mucilage, the color does not at once change, but presently a strong, yellowish-brown tint is produced, and the gum "sets," and then the layer dries up, leaving the paper very flexible for a long time, and highly glazed."

THERE IS NO OBJECT UNWORTHY OF OUR NOTICE.—"While I am reading" says a careful student on natural history, "a fly settles on my hand; I don't kill it; I watch it, with a glass perhaps, and see it clean its wings and its head, and make friends with it till I feel I can speak to that fly; and so it is with everything living. If we will humble ourselves and condescend to look at the apparently lowest creatures, we shall find instruction in the meanest of them."

[COLLATED WEEKLY FROM ALL NOTICES ADVERTISED IN S. F. JOURNALS.]

ASSESSMENTS.									
Name of Co.	Location.	Secretary.	S. F. Office.	Aasm't.	Levied.	Delinq't.	Sale.		
Adams Hill C. M. Co.	Eureka Dist.	W. W. Traylor.	414 California St.	25	Dec. 23.	Jan. 24.	Feb. 14		
AMAZON S. M. CO.	Ely District.	W. C. Frankfort St.	109	1	Dec. 23.	Jan. 24.	Feb. 14		
Arkansas M. Co.	Ely District.	J. W. McQuire.	419 Cal. St.	1	Dec. 7.	Jan. 10.	Jan. 26.		
Baltimore Co. Co.	Washoe.	J. H. Applegate.	729 Montgomery St.	50	Nov. 6.	Dec. 16.	Jan. 11		
BUNKER HILL C. M. CO.	Cal.	D. T. Bagley	401 California St.	10	Nov. 12.	Dec. 18.	Jan. 11		
California C. M. Co.	Cal.	W. C. Frankfort St.	13	10	Dec. 18.	Jan. 24.	Feb. 14		
Chapman M. & M. Co.	Cal.	T. B. Wingard.	318 California St.	25	Nov. 14.	Dec. 18.	Jan. 7.		
Com. Virginia M. Co.	Washoe.	F. Swift.	415 Montgomery St.	25	Dec. 12.	Jan. 20.	Feb. 12		
CORONILLA G. & S. M. CO.	Nevada.	O. T. Bagley.	401 California St.	3	Dec. 16.	Jan. 20.	Feb. 13		
ESTRADA BROS. S. M. CO.	Merced.	E. W. Reed.	221 Washington St.	25	Dec. 17.	Jan. 21.	Feb. 10		
"29" M. Co.	Washoe.	A. Noel.	419 California St.	25	Dec. 16.	Jan. 22.	Feb. 12		
GOLD RUN M. CO.	Nevada Co. Cal.	H. D. Howard.	123 Montgomery St.	1	Nov. 23.	Dec. 27.	Jan. 14		
Golden Tunnel M. Co.	Cal.	C. Palmer.	Market and Spear Sts.	1	Dec. 30.	Jan. 24.	Feb. 25		
GRAND BLVD. R. C. CO.	Cal.	W. H. Watson.	302 Montgomery St.	10	Nov. 16.	Dec. 18.	Jan. 7		
Grave Valley Blue G. Co.	Cal.	A. O. Carpenter.	Merchants' Ex.	25	Dec. 12.	Jan. 11.	Feb. 3		
Hale & Norcross S. M. Co.	Washoe.	J. F. Litchner.	414 California St.	5	Nov. 13.	Dec. 18.	Jan. 11		
HARPER M. CO.	Ely District.	W. C. Frankfort St.	366	10	Nov. 23.	Dec. 25.	Jan. 13		
Hudson G. M. Co.	Cal.	J. L. King.	411 California St.	7	Nov. 11.	Dec. 16.	Jan. 6		
Hermes M. Co.	Ely Dist.	B. B. Minor.	414 California St.	1	Nov. 7.	Dec. 13.	Jan. 8		
Huhn & Hunt S. M. Co.	Ely Dist.	D. T. Bagley.	401 California St.	1	Nov. 12.	Dec. 18.	Jan. 11		
"HUNTER" S. M. CO.	Ely Dist.	D. Buck.	331 Montgomery St.	1	Dec. 12.	Jan. 19.	Feb. 9		
Jewett G. & S. M. Co.	Washoe.	J. M. Buffington.	Merchants' Ex.	5	Dec. 13.	Jan. 17.	Feb. 3		
Josephine Q. Co.	San Luis Obispo.	G. Staack.	305 Sansome St.	2	Dec. 4.	Jan. 13.	Feb. 4		
Kentucky M. Co.	Washoe.	T. W. Scherer.	415 Montgomery St.	10	Dec. 11.	Jan. 14.	Feb. 1		
Ketchikan G. & S. M. Co.	Ely District.	F. Swift.	415 Montgomery St.	50	Dec. 2.	Jan. 15.	Feb. 5		
Lady Emma M. Co.	Cal.	J. P. Cavalieri.	509 California St.	25	Dec. 12.	Jan. 11.	Feb. 3		
Lander C. M. Co.	Cal.	A. O. Carpenter.	Merchants' Ex.	25	Dec. 12.	Jan. 11.	Feb. 3		
Lineda Quarry & L. C. Co.	Eureka.	W. C. Frankfort St.	332	5	Nov. 19.	Dec. 18.	Jan. 11		
Magnolia S. M. Co.	British Col.	B. B. Minor.	411 Cal. St.	5	Nov. 3.	Jan. 4.	Jan. 25		
McMahon S. M. Co.	Eureka Dist.	L. Kaplan.	Merchants' Ex.	10	Dec. 17.	Jan. 22.	Feb. 10		
MAAMMOTH BLUE O. CO.	Schell Creek.	G. R. Spinney.	320 California St.	25	Nov. 25.	Dec. 23.	Jan. 20		
Mammoth S. M. Co.	Cal.	W. C. Frankfort St.	28	10	Dec. 18.	Jan. 13.	Feb. 13		
Marion S. M. Co.	White Pine.	L. J. King.	411 California St.	10	Nov. 12.	Dec. 18.	Jan. 8		
Minnesota G. & S. M. Co.	Ely District.	L. Kaplan.	Merchants' Ex.	25	Dec. 3.	Jan. 16.	Feb. 5		
MINA RICA M. CO.	Nevada.	Wm. Willie.	419 Cal. St.	50	Nov. 26.	Dec. 23.	Jan. 18		
MORRIS & BIRD M. CO.	Placer Co. Cal.	C. O. Canney.	320 Montgomery St.	1	Dec. 18.	Jan. 4.	Jan. 23		
MT. JEFFERSON M. & M. CO.	Cal.	H. O. Kibbe.	419 Cal. St.	10	Dec. 5.	Jan. 10.	Jan. 31		
Newt Booth Con. M. Co.	Ely Dist.	J. W. Clark.	413 California St.	15	Dec. 18.	Jan. 27.	Feb. 17		
Northern M. Co.	Ely District.	E. W. Lamb.	314 California St.	25	Dec. 30.	Feb. 7.	Feb. 17		
National M. Co.	Washoe.	W. C. Frankfort St.	302	6	Nov. 20.	Dec. 12.	Jan. 8		
NORVILLE M. CO.	Nye Co. Nev.	B. B. Minor	411 1/2 California St.	50	Nov. 7.	Dec. 13.	Jan. 6		
OLD PROVIDENCE M. CO.	Cal.	Frank Swift.	415 Montgomery St.	25	Nov. 7.	Dec. 14.	Jan. 6		
OPHIR C. S. & G. M. CO.	Placer Co.	C. C. Logart.	402 Montgomery St.	10	Dec. 10.	Jan. 25.	Feb. 17		
Overman S. M. Co.	Cal.	C. M. Logart.	415 California St.	25	Nov. 26.	Jan. 8.	Feb. 17		
Overman S. M. Co.	Washoe.	W. W. Watson.	411 California St.	\$5.00	Dec. 31.	Jan. 25.	Feb. 12		
Pacific Box Co.	Esmeralda Nev.	E. Leuba.	507 Montgomery St.	25	Dec. 31.	Nov. 30.	Feb. 15		
Pacific Coal Co.	Cal.	A. Leachman.	First and Market.	10	Oct. 25.	Nov. 13.	Dec. 17		
Pacific Coal Co.	Contra Costa Co.	J. F. Litchner.	418 California St.	50	Dec. 18.	Jan. 20.	Feb. 10		
Pacific Coal Co.	Cal.	T. W. Corbun.	418 California St.	25	Dec. 18.	Jan. 27.	Feb. 24		
Picchoe West Ex. M. Co.	Ely Dist.	C. E. Elliott.	413 Cal. St.	1	Nov. 5.	Dec. 12.	Jan. 5		
Picchoe S. M. Co.	Eureka District.	J. McGraw.	419 California St.	10	Nov. 18.	Jan. 16.	Jan. 27		
PLACER MOUNTAIN M. CO.	Cal.	W. W. Clark.	418 California St.	50	Nov. 21.	Dec. 30.	Jan. 24		
Placer G. M. Co.	Placer Co. Cal.	G. W. R. King.	411 California St.	10	Dec. 3.	Jan. 6.	Jan. 27		
Poachontas G. M. Co.	El Dorado Co.	A. C. Jennings.	401 California St.	10	Dec. 3.	Jan. 4.	Jan. 25		
QUAIL HILL M. & W. Co.	Cal.	J. McGraw.	428 California St.	1	Feb. 4.	Feb. 4.	Jan. 28		
Rising Star.	Eureka Dist.	H. C. Howard.	332 Montgomery St.	10	Dec. 6.	Jan. 10.	Jan. 25		
Rising Star.	Eureka Dist.	J. M. Buffington.	Merchants' Ex.	15	Nov. 22.	Dec. 27.	Jan. 13		
Sanderson G. M. Co.	Cal.	W. Stuart.	418 California St.	12 1/2	Nov. 25.	Dec. 27.	Jan. 17		
Silver Peak M. Co.	Ely District.	C. K. Kierman.	419 California St.	10	Nov. 25.	Dec. 27.	Jan. 17		
Silver Peak M. Co.	Idaho.	J. Kine.	411 California St.	10	Nov. 27.	Jan. 6.	Jan. 27		
SPRING MOUNTAIN T. CO.	Nev.	J. M. Buffington.	Merchants' Ex.	20	Dec. 17.	Jan. 26.	Feb. 17		
Star King S. M. Co.	Elko, Nev.	L. Kaplan.	Merchants' Ex.	50	Dec. 26.	Jan. 34.	Feb. 19		
Succor M. & M. Co.	Washoe.	W. W. Watson.	302 Montgomery St.	25	Nov. 26.	Jan. 27.	Feb. 17		
Sunmit G. M. Co.	Amador Co. Cal.	GEO. Davidson.	731 Montgomery St.	25	Dec. 17.	Jan. 20.	Feb. 7		
Tecumseh G. S. & C. M. Co.	Cal.	F. J. Herrmann.	418 Kearny St.	25	Nov. 18.	Dec. 27.	Jan. 17		
Tebama Con. M. Co.	Schell Creek.	W. W. Seison.	414 California St.	60	Nov. 27.	Feb. 28.	Jan. 18		
Union Gravel Co.	Cal.	320 Barb.	228 Clay St.	50	Nov. 13.	Dec. 30.	Jan. 20		
U. S. GRANT M. CO.	Cal.	Ence Taylor.	226 California St.	5	Nov. 11.	Jan. 20.	Feb. 10		
VIRGINIA CONN. M. CO.	Cal.	T. B. Wingard.	318 California St.	2	Dec. 13.	Jan. 20.	Feb. 10		
Washington & Creole M. Co.	Ely Dist.	F. D. Cleary.	Merchants' Ex.	50	Dec. 21.	Dec. 28.	Jan. 15		
W. H. H. M. & S. Co.	Idaho.	J. McGraw.	419 California St.	10	Nov. 18.	Jan. 16.	Jan. 27		
War & Beecher Con. M. & M. Co.	Nev.	F. D. Balcom.	426 Montgomery St.	2	Nov. 4.	Dec. 10.	Jan. 8		
YULE GRAVEL M. CO.	Cal.	A. C. Jennings.	401 California St.	1	Nov. 21.	Dec. 23.	Feb. 22		
YULE GRAVEL M. CO.	Cal.	Wm. H. Watson.	301 Montgomery St.	20	Dec. 18.	Jan. 18.	Feb. 10		

MEETINGS.									
Name of Co.	Location.	Secretary.	Office in S. F.	Meeting.	Date.				
Com. Virginia M. Co.	Washoe.	D. T. Bagley.	401 California St.	Special.	Jan. 23				
Edue Quicksilver M. Co.	Cal.	Wm. H. Watson.	413 California St.	Special.	Jan. 13				
Indue G. M. Co.	Cal.	Called by Trustees.	Merchants' Exchange.	Special.	Jan. 6				
Indue G. M. Co.	Cal.	Called by Trustees.	Merchants' Exchange.	Special.	Jan. 6				
Indue G. M. Co.	Cal.	Called by Trustees.	Merchants' Exchange.	Special.	Jan. 6				
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THURSDAY, Jan. 2d, 1880

SAVAGE.—During the week ending Dec. 28th, 784 tons of ore was extracted averaging \$34.32 per ton; 625 tons were sent to mill and 274 tons remain on dump.

HALE & NORCROSS.—The work of constructing the pumps, pump-beds and pump-tanks was finished on the 29th. During the week ending Dec. 28th, 810 tons of ore was extracted; 852 tons delivered to mills; and 1,058 tons remain on dump.

RAYMOND & ELY.—On the 27th ult. \$31,965 was shipped; previous shipments in December \$256,039, to which add last shipment, making a total of \$288,006 in 27 days; equal to \$10,662.82 per day. There was a strike at this mine last week on account of working hours. Full shifts of ten-hour men are now at work, although they struck for eight-hour shifts.

CEDERBURG.—This company have received 318 ounces of gold from 12 days' run of the mill.

EUREKA CONSOLIDATED.—Prospects are reported favorable for a large body of ore in the northwestern drift of the Lawton shaft. Three furnaces running.

EUREKA.—The last clean up for five days' run of ten stamps was 975 ounces of amalgam.

Geological Survey.

We call the attention of numerous parties who persist in this assertion that nothing has really been accomplished by Professor Whitney in the Geological Survey of California, to the following notice of the manner in which a map of his survey was received by the learned Professors of Cambridge:

At the November meeting of the Academy of Sciences, held at Cambridge, Mass., Professor J. D. Whitney read a paper entitled "Notice of the Progress of the Topographical Work of the Geological Survey of California." His elucidation of the work and the maps drew forth commendation from Professor Agassiz and Pierce, Professor Agassiz said he had been critically examining these maps, and was surprised at their extent their beauty and accuracy. The geological survey of France had been going on for more than thirty years, but had not produced so much in the way of topographical work as had been done in the short time of the ge-

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LATEST DIVIDENDS—(Within Last Three Months.)					
Name of Co.	Location	Secretary	Office in S. E.	Amount	Payable

Belcher M. Co.	Washoe.	H. C. Kibbe.	419 California St.	\$3.00.	Sept. 10.
Black Diamond Coal Co.	California.	P. B. Cornwall.	Cr. Harrison and Spear.	2 1/2 per cent.	Nov. 11.
Cederburg G. M. Co.	California.	D. M. Skokes.	420 Montgomery St.	50c.	Dec. 31.
Comstock Open Day Coal.	Oregon.	W. Merchant.	420 Montgomery St.	\$1.00.	Dec. 10.
Eureka G. M. Co.	Grass Valley.	R. Wegener.	414 California St.	\$1.00.	Dec. 11.
Mahogany G. & S. M. Co.	Yuba.	T. J. Owens.	402 Montgomery St.	\$1.00.	Aug. 7.
Grass Valley Coal Co.	Ely Dist., Nev.	T. W. Cramer.	403 California St.	\$1.00.	Dec. 10.
Raymond & Ely M. Co.	Ely Dist., Nev.	A. J. Moulder.	413 California St.	\$1.00.	Dec. 10.
Pioche S. M. Co.	Ely Dist., Nev.	C. E. Elligi.	413 California St.	\$1.00.	Aug. 10.
Providence G. & S. M. Co.	Advised in this Journal.	J. M. Buffington.	Merchants Exchange.	\$1.00.	Nov. 12.

ological survey of California. Prof. Pierce thought it was a work of immense national importance, and should not be interrupted.

Professor Whitney had worked through much adversity and difficulty, but he had been rewarded by such magnificent results, California had reason to be proud of the work and could not do less than carry it to a successful completion.

Palmer's Postal Telegraph Bill.

Palmer's bill providing for the establishment of a postal telegraph service will receive the almost unanimous approval of the Committee on Appropriations. Mr. Palmer gives some interesting statistics relative to the effect upon the press of England by the reduction of telegraph rates. Formerly the English telegraph sent news reports to only 173 journals in the year. Afterwards the Postoffice sent them to 467. The telegraph companies sent during the session of Parliament nearly 6,000 words daily, and during the remainder of the year 4,000 words daily. The Postoffice in the year afterwards, sent during the session of Parliament nearly 20,000 words daily, and during the remainder of the year nearly 15,000 words daily.

The increase in private business was at the same rates. Under the present system of telegraphing in the United States, there is not an adequate degree of accuracy, secrecy and promptness in delivery of messages.

Telegraph offices are often placed in the charge of boys immature in experience and education, and companies locate their offices in rooms devoted to other kinds of business and unprotected from the intrusion of curious and mischievous visitors. The Postoffice Department is sworn to secrecy. On the other hand, telegraph operators are under no legal obligations not to divulge the contents of messages.

Here is a mass of statistics which are unanswerable as arguments for the change demanded by the people in the telegraph system. They fortify the position assumed by the press of the country, and strengthen the bands of the friends of the measure everywhere. The opponents of this righteous and equalizing reform consist only of two gigantic monopolies—the Western Union Telegraph Company and the Associated Press.—*Eureka Sentinel.*

ARE POTATOES EXPLOSIVE?—The N. Y. *Gas*

Light Journal says that a few days since the engineer of Ryan's Pork House at Galsna, Ill., having heard that potatoes would keep the boiler free from scales, put half a bushel in it — used the engine one day only, when he opened the valves, let all the water out of the boiler, took off the head of the hand hole (7 by 9) placed it against the opening, covering it except sufficient space to admit his arm. Wishing to ascertain the effect of the potatoes, he attempted to put a lighted candle in the opening, when an explosion took place, throwing his hand back with great violence, and driving the loose hand-hole head with such force that it buried itself two feet deep into a coal pile in the rear, shaking the whole building and filling the room with a cloud of sooty substances. The engineer says that he saw nothing in this explosion that looked like fire or blaze, and that the boiler was not injured. The *Journal* though devoted especially to the discussion of subjects connected with gas, is unable to explain the mystery.

MAONIFICENT RUN.—The Salt Lake *Mining*

Journal, of December 19th, says:—One of the biggest runs of bullion evr made in the Territory, in the same length of time, has just been made by the Saturn Smelting Works at Sandy, of which Mr. S. M. Gerrish is the affable superintendent. In twenty-six days there was a run of 365 tons of bullion, which averaged 165 ounces.

RAILWAY enterprise has met with great success in Japsn. The first line has been opened with great *eclat*, and rapid traveling has proved so congenial to Japanese taste that three additional trains per day have been added to the original time-table.

INDIANA has rich mines of excellent coal, and furnaces just built can produce 50,000 tons of pig a year, while mills at Indianapolis, New Albany, Greencastle and Terra Haute produced 13,000 tons of rails in the past year.

MINING SUMMARY.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

BUTTE COUNTY.

A VAST MINING CLAIM.—Butte Record, Dec. 28: A new placer has been found in Morris' Ravine, not far from the Cape Claim. The deposits are supposed to come from Table Mountain. There were rich claims in this vicinity in '42 to '50; but they were only skimmed over. Extensive preparations are making to work these gravels with hydraulic process, and the flumes for that purpose are nearly completed.

MORRIS RAVINE.—Butte Record: The extensive deposit into which Hendrick's Brothers 2,500 inches of water, under several hundred feet pressure, is cutting its way, is unmistakably of the same character as the deposits at Cherokee. Their ditch is fifty miles in length, taking water from the West Branch of Feather river, conveying it across depressions in huge iron pipes and around the mountain sides, until it debouches into a vast reservoir at the head of Morris Ravine. From thence it is carried in large pipes, under a head of 200 feet pressure, to the claim. Here a distributor divides the current into three pipes, each of which is attached to a hydraulic chisel, which hurls eight hundred inches of water against the face of the claim with great and irresistible force, before which the earth melts away, and even the bed-rock is torn up and thrown high in the air, shivered to atoms and blown away down the ravine. The chisels are worked by electricity, and operated each by a single man, and, after the flume is laid, and the mountain loosened with powder, do the work of mining. On a recent visit to this claim, we witnessed the power of one these monitors, in cutting a passage through the bed-rock for the flume. It was stationed above the head of the flume, and hurled 800 inches of water into the air, creating a large number of fountains in the direction of the head of the flume, cutting its way through the rock with the apparent precision and ease of a gardener's spade in yielding soil, and almost with the rapidity of electricity. It is but recently these vast arrangements have been perfected on this claim. Blasting tunnels have been run into a mountain almost as large as one of our Buttes, which will soon be shattered by a blast, fired by electricity, the buildings in the vicinity being barricaded by planks, to protect them from the falling dirt. The hydraulic chisel, under the direction of a single man, will do the balance of the work. Much coarse gold is found on the bed-rock in their claim. Their mining flume, which lies deep down in the bed-rock at the claim, extends for a distance of about 24 miles from north to south, and is four feet in width, of a firm and substantial structure, and paved with rock. It is their design to extend this flume down the river to Feather river, a short distance above Oroville, and opposite the river claim of '57, known as the famous Cape claim. It was the theory of the speculator then that the rich deposits found in the famous Cape, were washed down Morris Ravine from the deposit underlying Table Mountain.

CALAVERAS COUNTY.

YEABO.—Angels Mountain: This is the name of a new mining district situated in the southeast portion of this county, which has been located by a large number of capitalists. It is principally gravel digging, and of large extent. In the spring the company propose erecting hydraulic machinery with which to work their claims.

GWIN MINE.—Thirty-six stamps are now in operation giving an average of \$1,000 per day. The rock in the 800 and 600-ft. levels is high grade and improving as work progresses. The new pumps work nicely.

KERN.

THE MINES.—Havilah Miner: Providence never gave to earth a finer country for poor men than the county of Kern. The country is about 24 miles from north to south, and 120 miles from east to west, in extent. The mineral belt extends from the northern to the southern boundary of the county, and is forty miles in width—the whole eastern end of the county. Fully one-half of the gold belt has never been prospected. There are 4,000 lodges recorded in Kern county, of these, nineteen-twenty have been abandoned, one-fourth of these lodges will pay good wages—say from \$4 to \$20 per day to the man for working; always providing, the man himself does the labor—as has been amply demonstrated in every instance, where after large, splurging companies have failed, a company of from two to six have taken hold of the same mine, and not only proved the mine to be a good and valuable one, but made handsome profits out of it.

Antimony veins, sixty feet wide, have been discovered in Kern county. The ore, it is said, will yield from 75 to 80 per cent. of crude bullion, containing enough of silver to pay for the mining and reduction, leaving the smelter for net profit.

MENDOCINO COUNTY.

MINERAL.—A correspondent of the Democrat writing from Conway's Landing, on the coast, near Pt. Arenas announces the discovery on the ranch of W. Tift, of iron, coal and a peculiar and valuable species of clay. The iron deposits have not been prospected, but are believed to be sufficiently extensive to yield an abundance of ore. The coal has been tested in a blacksmith shop and is pronounced superior to Mt. Diablo coal. The deposits of clay, which are very extensive, consist of different layers of deep yellow and deep blue color. It is plastic and is susceptible of a high polish. Artistic mantel ornaments are made of it by the ladies of the family. When dried and burned it becomes very hard and very strong.

NEVADA COUNTY.

THE MANZANITA CLAIM.—Nevada Transcript, Dec. 27: The claims of the Manzanita Hill, just above town, are being fitted up by Roberts & Co., the new owners, in splendid trim for work. They have rebuilt the flume, repaired and enlarged the capacity of the ditch and are fitting up in the best manner for work. They expect to get their work done and have water about the 10th of January. They will run a head of 2,000 inches and the claims will be worked on a more extensive scale than ever before.

QUAKER HILL.—Nevada Transcript: The late storm has given water enough for washing in most of the hydraulic claims. The season is not much later than last, and the indications are that it will be equally as good. The claims of Jacobs & Sargent, at Quaker Hill, in which washing commenced last year on the 23d, started up this year on the 25th, or two days later. The weather during the season has been moderate, and there has been no freezing weather. This makes all the water which has fallen available for mining.

GOLD.—Grass Valley Union, Dec. 25: The Empire mine sent a brick of gold into town yesterday valued at about \$9,000. It was from a run of ten days. The Empire continues to show a rich ledge. Speaking of gold reds, we use to us to say that the article is coming in quite freely. Delano shipped over \$10,000 yesterday morning, most of which came in on Saturday.

BULLION.—The Eureka shipped yesterday gold bars valued at something over \$20,000, the product of ten stamps, after 12 days' run. The Idaho cleaned up \$12,000 after a run of 5 days. In the Idaho only the amalgamators were cleaned up. Three mines of Grass Valley (Eureka, Idaho and Empire) give to the money-circulation of the country something over \$41,000 as a Christmas present. The small mines of Grass Valley district give as much more, to say the least.

PLACER COUNTY.

JULIAN MILL AND MINING CO.—Auburn Argus, Dec. 27: This Co. have again resumed active operations with very

flattering prospects for the future. This company have erected one of the best 20-stamp quartz mills and hoisting works in the State.

THE ST. LAWRENCE MILL AND MINING CO.—Have about completed the erection of a first-class 12-stamp water-power mill on Auburn Ravine, about one-half mile from the town of Ophir. The company have nearly completed a tunnel which will tap the ledge at a depth of about 80 ft.

BELLEVUE.—This mine is yielding very rich ore from the tunnel ledge, and the rock taken from the shafts looks well.

THE GREEN.—Mine continues to furnish an abundance of very rich ore, full equal to any heretofore taken from this celebrated mine.

PLUMAS COUNTY.

GENESEE QUARTZ MINE.—Plumas National: To Mr. Wm. Eagle, who has been working in this mine for several months past, we are indebted for the following mining news: The claim was purchased, some months ago, by Mr. H. O. Bidwell and a San Francisco Company, from Mr. J. H. Blood for the sum of \$10,000. Work was commenced on the "East Hill," and in a short time the tunnel tapped a ledge, the rock from which has paid an average of \$10 per ton, and the 5-stamp mill has been running steadily. A shaft raised from the tunnel, to obtain good air, has developed a very rich "pocket," and some of the finest specimens ever taken from the ledge. A man of decomposed quartz yielded \$61, and Mr. Eagle is of the opinion that a two-inch "dreck" in the ledge will pay at a rate of \$100 to the pan. The prospects of the company are very bright just at present, and this claim promises to be very valuable for years to come. Every pound of quartz in the claim has more or less gold in it, and "pockets" fabulously rich are often found. We hope they will continue to prosper. The discovery of a ledge has been discovered in Tuolumne county, about sixty miles northeast of the town of Sonora. It assays a fraction over \$100 to the ton, and has a width of 30 ft. at the surface.

SAN DIEGO COUNTY.

BANNER DISTRICT.—Cor. San Diego Union, Dec. 20: Times are dull, just now, the weather colder than has been experienced for two years. The Kentuck mine looks well. They began stopping last week in the richest rock they have yet had. They are hoisting with their new whim, which works well. The Bailey boys, in the Ready Relief claim, are using hand-drills. They are taking out good rock and are doing well. The Golden Chariot is working 25 men. They began sinking on Monday last. Their new whim works very satisfactorily. The ledge is 4 ft. wide, of rich rock.

TUOLUMNE COUNTY.

PATTERSON MINE.—The Patterson, sometimes called the Tri-Color Mine, at Tuttle-town, Tuolumne Co., has been sold for J. J. Corrigan, of San Francisco, for \$30,000. This is an old mine, which has been worked more or less since 1857. The vein is a large one and well-defined. Two tunnels will be opened for the more convenient working of the mine, and a mill will be immediately erected.

GRIFFIN.—Tuolumne Independent, Dec. 28.—Dec. 28: Last week on the 600-ft. level in the Griffin mine, the vein was six ft. wide and very rich. Rock will go over \$300 per ton.

HESLEY.—At 300 ft. in the Hesley mine the vein is 10 ft. wide. Every shot they put in the rock, fine gold is perceptible.

COLUMBIA.—Quartz interests are reviving in and about this county. In all parts the pick and shovel are at work on the fodes for "pockets," to obtain means for more systematic working of the veins proper, many of which prospect splendidly. The proper development of the rich veins about Columbia and the American Camp district will put Columbia on her legs again.

The New Albany mine on the North Fork of Tuolumne, has been sold for a good price to a company in San Francisco, which propose to sink a shaft and prospect the lead thoroughly before putting up a mill—a practice not often carried out in quartz mining. The vein is about 3 ft. wide, with good prospects.

THE ALBERGNE.—This vein is at Algerine Camp; the lead is about 2 ft. wide and gold is distributed through the rock. Algerine was a flourishing camp in '53 and '54, and large quantities of gold and silver were taken from the places in the vicinity, before quartz mining was hardly known. A great part of the gold found has no doubt been fed from the various leads. The country is rich in quartz from Algerine to Rough and Ready.

Nevada.

BULLION.—Pioche Record, Dec. 22: The shipment of bullion for the past week has been \$34,249.33.

PAICOT TUNNEL.—Has been driven a distance of 1,136 ft., and the entire tunnel from mouth to face is a masterly piece of work. Thirty-five ft. from the face a drift is now being run. A ledge of some 8 ft. in width has been cut hearing north and south. From surveys made it is ascertained that the tunnel is 502 ft. from the surface. This proves conclusively that the veins of this district run to a great depth.

TEMBEWE.—This mine is situated on the southeast point of Casenknife mountain, and about 800 ft. north of Page and Panaca. The shaft has reached a depth of 55 ft. The ledge has been cross-cut at the above depth, showing it to be 10 ft. in width. Assays average \$100 per ton. Quartz of a peculiar character has presented itself, bearing large quantities of sulphurets of lead. There are two ledges now showing in the drift, running at right angles, and the miners in each gives evidence that at the proper depth an immense body will be struck. The work of sinking an incline is now in progress; both ways are plain and visible, but irregular. The selva and clay exceeds anything yet seen in Ely District.

SILVER PEAK.—The ore on the dump is very poor, only averaging about \$18 to the ton. The shaft is now at an incline depth of 140 ft. and sinking constantly.

PROCEE PROXIM.—This mine within the last week has opened up magnificently. Ore is constantly hoisted. SPRING COUNTRY TUNNEL.—Work is being carried on here in the ledge level, about 250 ft. from the mouth. The depth already attained is 35 ft., and soft ground has now been reached. The ledge is increasing in size.

CHIEF OF THE HILL.—A contract has been let to sink a shaft 100 ft. From portions of the mine from 5 to 5 tons of ore are being taken out daily. The shipment of bullion from the 1st of December to this date is \$5,728.36. On the Magnet mill dump there are 47 tons of ore waiting to be crushed.

AMADOR TUNNEL.—This tunnel has now reached 400 ft., and men are kept constantly at work. About 6 tons of ore are being taken out daily. During the last week a new ore house has been built.

SUNBEAM AND ORO.—Ore of a very rich character is being constantly hoisted, and the mill is steadily employed working the ores of both mines.

BOWERY.—Work on the contract is progressing rapidly. The present appearances give evidence of a rich strike before long.

PIKE.—This mine keeps turning out rich ore. Seventy-five tons are now lying on the dump. Arrangements have been made with the Magnet Mill Company to crush the ore of this Company. The shaft is 550 ft. in depth. At the 450-ft. level an incline was sunk to the depth of 100 ft. Drifting for the ledge from this point will probably be started during the coming week. About 5 tons of rich ore are being raised daily.

PARLAN.—This mine is situated in the northwest direction from the Court House, on the Highland road. Last Tuesday work was commenced, and the ledge now shows 2 ft. in width.

STANDARD.—Depth of shaft, 130 ft. A drift at this depth has been run on the ledge in a westerly direction 150 ft. The ledge is about a width of 10 ft., and assays average \$75 to the ton.

OCEAN BELL.—The principal work on this mine since our last review, is the timbering of the mine. The depth of the shaft is now 175 ft. Sinking will be re-

sumed during the coming week, and will continue to the depth of about 300 ft.

MARION.—The winze has been sunk 150 ft. on the ledge, which is well defined, with very favorable indications. Sinking continues.

MAZEPA.—Has proved itself to be equal to every expectation. The pulp assay of ore at the mill goes \$124.07 to the ton. Ore will be constantly shipped to the mill. The hoisting works will be put up shortly.

MONTANA.—The indications are looking favorable, and the prospects are that 30 ft. more will show up the ledge.

CHIEF EASTERN EXTENSION.—The principal work on this mine lately has been the timbering of the winze below the 90-ft. level. The work will be completed by to-morrow, when the work of sinking on the ledge will be resumed.

EXCELSIOR CHAMPION.—Still sinking at 220 ft., and no material change has shown itself since our last report.

CHARTER OAK.—On Thursday last the Charter Oak mine, one of the early locations of Ely District, made one of the richest strikes that has been made in the camp for a long time—a vein five feet in width that assays \$1,450 to the ton.

EXCELSIOR.—The Excelsior is constantly hoisting ore, and is turning out mill running night and day.

THE SUNBEAM.—Is showing a vein 3 ft. in width, assaying at an average of \$1,380 to the ton. The Portland and many other mines too numerous to mention, have their dumps loaded with first class ore, awaiting their turn for a crushing.

WASHOE.

SILVER HILL.—Gold Hill News, Dec. 28: The shaft is down 85 ft. The main drift is in 24 ft.

GOLD & CUREY.—Prospecting at the lower levels still goes steadily on, with no new developments or change of material interest to note. Sinking the incline is still progressing slowly, the rock working tough and hard.

SAVAGE.—Daily yield of ore 145 tons, worth \$27 per ton. The old ore-body in the upper works of the 661-ft. level, still holds out. The incline is down 104 ft. below the 1000-foot level, the sinking making excellent progress. The main south drift on the 600-foot level is still driven ahead. The main north drift on the 1000-ft. level, is also making much better headway.

CALABONIA.—The main north drift on the 400-ft. level from the new shaft, is pressed vigorously ahead. A cross-cut west from this drift has developed some very fine ore.

CHOLLAR P. ROSS.—Daily yield, 150 tons of ore, the assay value of which is \$32 per ton. Repeating the shaft is progressing slowly. The new Root boiler appears to be a perfect success.

HALE & NORCROSS.—But little ore has been extracted during the past week. The work in the mine has been mostly confined to excavating for the water-tanks and getting the pumps ready for operation. No new developments of interest to note.

EMERALD EXTENSION.—The new development or change of interest to note. The surface-work is being pushed to completion as fast as the material can be obtained.

CON. VIRGINIA.—The shaft is down 94 ft. below the 500-ft. level in good sinking ground. The main north drift, on the 1127-ft. level, is pushed steadily and vigorously ahead. The new hoisting works are about completed.

OVERMAN.—The head of water in the shaft continues very strong, though it is being slowly and steadily lowered by the unceasing use of the hoisting-tanks.

INSURANCE.—The incline is down 85 ft., the full size of the shaft still in good ore. The sinking has been greatly retarded during the week by a cave in the air-shaft.

SUNBEAM.—Daily yield, 150 tons of ore, worth \$27 per ton. Prospecting the 500-ft. level of the new shaft, goes steadily on. The ore producing stations in both the upper and middle portions of the mine are looking and yielding well.

MINT.—Sinking the shaft is making slow but steady progress. An assay of ore taken from the shaft during the week, assays \$42.20 silver, and \$60.80 gold, making a total of \$203 per ton.

BELOCHER.—Daily yield, about the same as last week, 320 tons. The winze between the 1,100 and 1,200-ft. levels, 200 ft. from the Crown Point line, is down 56 ft. The south drift at the 1,200-ft. level, is being driven ahead to connect with the station being opened in the main incline.

YELLOW JACKET.—Drifting and cross-cutting at the 1,300-ft. level north, progress as usual. Drifting east for the ledge at the 1,400-ft. level from the incline is resumed.

JULIA.—Repairing the broken machinery was finished and the rock in the shaft and drifts resumed last Monday. The work in the bottom of the shaft works well, and the sinking is making good progress. The main east drift on the 800-ft. level is in 250 ft., running through ledge matter that promises some fine developments.

SUOCON.—Shaft about 250 ft. in depth. Rock hard, but fair progress is made. The hoisting machinery is in an effective condition, and operates well. Enough water comes into the shaft to keep the pump going considerably.

BUCKEYE.—About 25 tons per day, enough to keep the Hope and Sherman mills running, is being extracted. No change in the mine since last report. The ore assays about \$13 per ton on the average, and there is plenty of it in sight.

ARIZONA AND UTAH.—The new machinery is working splendidly. Sinking the shaft was resumed last Wednesday, and everything in and about the mine is putting on a new look.

CROWN POINT.—The ore breasts at the 1,100 and 1,200-ft. levels are looking and yielding splendidly. The 1,300-ft. level opens out richer and richer, the face of the south drift being still in fine ore.

UTAH.—The north drift on the adit level is still pushed vigorously ahead with no developments of interest to chronicle. The hoisting new and new shafts are still standing idle for want of the supply of wood necessary to run them.

PROTOV.—The drift north from the shaft is in 70 ft., and making satisfactory progress in good working ground. The shaft is not being sunk deeper at present.

GLOBE.—The ore body being developed in the raise from the tunnel shows improvement, and the main west drift is progressing.

EXTORTION.—Nothing doing at the 1,100-ft. level although the water is drained out. The only work done is in the old workings between the 500 and 700-ft. levels.

JACOB LITTLE.—The storm has interfered somewhat with operations in the upper mine, but the ore still continues to improve.

OCCIDENTAL.—The main north drift is still driven steadily ahead by the contractors with no material change of interest to report.

BALTIMORE CONS.—Shaft 393 ft. deep. Drift at the 250-ft. level in 178 ft. Rock still hard in both places, but works well.

WOODVILLE.—Shaft still sinking with good progress. Nothing new to report different from what we had last week.

KNICKERBOCKER.—Main drift in 438 ft. from the shaft. Rock still hard, but good progress made.

SENATOR.—Still shut down for want of the necessary supply of wood.

Idaho.

MARGOANT.—Owyhee Advertiser, Dec. 21: This mine is yielding very rich rock. The richest ore that ever came out of this mine is now found on the 6th level. They are sinking a winze on a new chimney of ore, 104 ft. south of the shaft. The ledge, as they go down, looks well.

MINNESOTA.—This mine looks well. They are sinking a winze on the 4th level, 120 ft. south from the shaft. Out of this it is said, the richest rock that was ever seen in the camp is taken. Also sinking a winze 200 ft. north of the shaft on a ledge 28 inches wide.

EMPIRE.—100 men are employed, and the yield is about 35 tons of ore daily. The ledge is about 2½ ft. wide

14 men are constantly employed in assorting rock. The ore looks splendid—free gold and silver in sight.

GOLDEN CHARIOT.—This mine is 800 ft. deep. Rich strike on the 6th level; stopping in the 6th and 7th levels. The vein is from 18 to 24 in. wide. Employing about 25 men.

SOUTH CHARIOT.—The total depth of the mine is 561 ft. Stopping in the 1st level shows a high grade of ore. The vein is 24 ft. wide. The yield of the mine is principally gold.

INA ELLMORE.—Is now 750 ft. deep, employing at present about 40 men; yielding 12 tons of ore per day, which looks well.

Lower California.

SAN RAFAEL MINES.—Cor. San Diego Union: About two weeks since a new lead, giving evidence of great richness, was discovered. Two tons of the quartz were crushed in arrastras and yielded \$825. Of course this was selected ore; but it is thought that the rock of the lead, which will average from 3 to 4 ft. in thickness, will give at least \$125 per ton. The new mine has been named Apponattox. The Pueblo mine is being worked actively.

A shaft has been sunk to the depth of 45 ft. on the lead, and a tunnel has been opened out. Two tons of selected ore were crushed, from which \$349 worth of gold was obtained. It is the intention of the owners to sink two more shafts, one of them on to San Francisco, in order to make a thorough test. If it "pans out," as they expect it to, arrangements will be made at once to erect a mill on the lead. The lead is a very wide one, averaging fully 4½ ft. It is one of the oldest discoveries; \$10,000 were taken from one pocket in sinking the discovery shaft. The Castillo mine adjoins the Pueblo. It is being worked by its owner, who has a number of men in his employ. A tunnel has been run from the sidehill, 25 or 30 ft. in length, which taps the lead. The quartz all shows free gold, and the men are engaged in taking out small quantities, which are crushed in mortars; 45 to \$20 a day are obtained by this process. Mr. Castillo also contemplates forwarding a quantity of ore to San Francisco, and has in view a purchase of a mill. The Zapata mine is located on a splendid lead, has rich quartz, and will pay to work. The St. Nicholas is not being worked at present, and the McKean & Hoffmann mill, which is on the St. Nicholas lead, is also idle. Both mine and mill, it is expected, will be worked very soon.

There is some prospecting going on, principally by Mexicans. Some of the dry places are also being worked with tolerable success. Frequently the industrious workers are rewarded to the extent of \$4 or \$5 per day for their labor.

Utah.

SILVER PRODUCTION.—The production of silver from the mines of Utah for the year 1871 is roughly estimated at \$5,000,000, and a writer in the Omaha Herald predicts that the total yield for 1872 will reach double that amount. It is difficult, however, to arrive at an accurate estimate of the production in that Territory, as the shipments are made, some of them in refined silver bullion, others in base bullion of varying value, and others still in ores of widely different degrees of fineness. It is believed, though, that the Little Cottonwood District alone has yielded more than \$500,000 worth of silver this year. There are seven mines there, besides the Emma, yielding more than \$500,000 each, some reaching as high as \$1,400,000.

NEW MINING DIST.—Salt Lake Herald, Dec. 19: Drum Dist. is a new discovery, and lies about forty miles south of Tintio. Mr. Hooper, who discovered the district on the 5th inst., gives us the following particulars in regard to it:

He found a large ledge regularly outcropping for about a mile, which carried a large and rich lode of copper ore, specimens which Mr. Hooper acknowledges were selected, have been assayed since his return to town, and yielded as high as sixty per cent. of copper, and forty dollars in silver per ton. Nevertheless, from tests made the ore is of a high average quality, and the quantity of it is represented as enormous. The district is less than sixty miles from the U. S. R. R., and some timber and water are stated to be abundant for steam purposes.

DE SOTO.—The De Soto mine continues to yield rich ore. The ore-streak in the vein is from 3 to 5 ft. wide; 4 miners are employed, who extract from 1½ to 2 tons of ore per week, besides several tons of second-class ore. The first-class is worth on an average \$400 per ton, and is shipped to San Francisco. The second-class is piled on the dump, to await the completion of the concentrator.

STAR DIST.—The Krom Concentrator, building in Star District, on which a large force of mechanics has been engaged for some months, is inclosed. It is 70 ft. high, 40 ft. wide and 74 ft. long. One car load of the machinery has arrived, and is being placed in position in the building. The balance of the machinery weighing 49,000 pounds is expected at Mill City daily. Water is to be the motive power. A "hardy-gurdy" wheel, 8 ft. in diameter, running under pressure of 250 ft., is to be used. 1,300 ft. of heavy sheet-iron pipe, capable of resisting this pressure, manufactured by C. W. Purdin, of this town, has been laid to convey the water from the creek to the mill.

ELY DISTRICT BULLION.—The bullion shipments from Pioche for 1872 amounted to about \$5,359,409, showing an increase of nearly 50 per cent. over that of the previous year. An improvement is noticeable in nearly all the principle mines of the district.

THE SNOW SLIDE IN UTAH.—The accumulation of snow in Cottonwood cañon, Utah, is immense, and this year, as last, numerous slides have occurred. A heavy avalanche occurred there on the 26th ult., in which eleven men are said to have lost their lives.

TIMBER.—President Grant indorses the recommendation of the Commissioner of Agriculture, that in disposing of public lands, that one-tenth be reserved in timber where it exists, and that where it does not exist, inducements be offered for planting this proportion. It is probable that the bill before Congress will be amended in accordance with the President's suggestion. From experience on the frontier, and knowledge of the circumstances of settlers on the public lands, President Grant is able to estimate correctly the probable result of such Legislation. He knows exactly what the average settler can do, or will try to do.—Northern Enterprise.

THE PRODUCT OF THREE IRON FURNACES IN BOYD COUNTY, KY., yielded more profit to the owners last year than all the tobacco raised in Davies County, where that staple is largely raised, to all the producers of that weed combined.

"BABY RAILROADS" is an expressive Western phrase for narrow-gauges.

The Railways and their Mineral Traffic.

Were proof required of the remarkable degree of activity which has characterized the staple trade of the United Kingdom during the past six months, the dividends paid and payable to the shareholders of the principal lines of railway would be most conclusive. On some lines the increased dividends have not been so substantial as the shareholders anticipated, nor, perhaps, as they had the right to expect; but these lines were principally passenger lines, and the increased receipts were largely diminished by the extraordinary high price of coals and the general advance in the wages of those employed. The receipts upon the mineral mines have, however, been steadily increasing, and there can be no doubt that, properly developed and with the requisite facilities granted, the iron and coal trades prove the "back-bone" of the railway system. Statistics demonstrate that a line of railway running through a good mineral district, and having good ports of discharge, or leading to large "nests" of manufacturing, must pay; and railway directors but ill advance their own interests and those of the shareholders when they ignore the claims which the iron and coal trades have upon them. The Taff Vale Railway, a short mineral line in Wales, will always be cited as one of the best paying lines in the whole kingdom, with its 1001 shares worth some 140% or 150%, and paying its 10 per cent. dividend with a regularity quite enviable by other lines, besides laying up almost every half year a considerable sum as a reserve fund to provide for any unforeseen contingency. This line is not only one of the best paying lines in the kingdom, it is one of the best managed; its trains run with clock-like regularity, and the wants and requirements of the colliery proprietors, the ironmasters, and the traders generally are not only met, but studied and promoted. Gladly, too, we acknowledge that of late years, and under the able management of Sir Daniel Gooch, the Great Western is directing far more attention to the necessities of the colliery proprietors and promoting the interests of the traders than in years gone by; and, verily, the increased dividends and the extraction of the affairs of the company from the financial complications which once surrounded them is the reward.

The line, as is well known, runs through the very vitals of the Principality, while its many arteries lead to sources of wealth, which, if still promoted and fostered, will yield results in the shape of dividends, of which the most sanguine scarcely now venture to imagine. Can anyone doubt the expediency and policy of the Great Western in the last venture they made on behalf of the colliery proprietors and traders of Wales? Does not the last report of the directors conclusively prove the soundness, even financially considered, of the expenditure in laying down the narrow-gauge? The golden harvest is at hand, and the present dividend is the highest paid in very many years past. The London and North Western has also tasted the fruits of its connection with the colliery districts, and its traffic receipts show an enormous increase as compared with those of former years. The Midland is evidently so well satisfied with its alliance with the Hereford, Hay and Brecon system, that they naturally yearn for a closer connection, and seek powers which will give them access into the very interior of Wales. The Swansea Vale is an essentially mineral line, and for many years never paid a shilling dividend; but such is the wonderful expansion of the staple trades of the district that the last half year at least 5½ per cent. was legitimately earned. The Monmouth, the Neath and Brecon, the Llanelly, the Rhymney and other lines have all more or less shared in the prosperity of the iron and coal districts, and there is every proof, therefore, that the dividends of railways, if not altogether governed by, is at least greatly dependent upon the activity or otherwise of the staple trades of the country. The Welsh line has been principally cited in this article, because they afford the most striking illustration of the point we are endeavoring to prove and have ever maintained—that the interests of railway directors and shareholders, and those of colliery proprietors and iron makers are very closely allied; they go hand in hand together; and all the directors of our main or trunk lines would promote their own interests

if they would strain every nerve to develop the resources of new mineral districts and encourage the expansion of trade by every means in their power.

As far as can be ascertained, the mineral traffic passing over the railways of Great Britain and Ireland in 1871 amounted to 102,222,464 tons. To this total England and Wales contributed 81,412,357 tons; Scotland, 20,337,781 tons; and Ireland, 472,326 tons. The receipts derived from this traffic were 10,029,253½, to which England and Wales contributed 8,610,713½; Scotland, 1,360,513½; and Ireland; 58,027½.—*Exc.*

New Idria Quicksilver.

But few people are acquainted with the history of the discovery of the New Idria quicksilver mines, and some facts having come under our notice, we give them for the benefit of our readers. In 1856 a party prospecting for silver in the southwestern part of this country—the present location of the New Idria works—discovered a deposit of chromate of iron, which they supposed to be a silver deposit, and for some time worked it as such, before finding out their mistake. Here the party separated, some going one way and some another. Some of the party shortly after discovered cinnabar at the San Carlos mine, and at about the same time ore was found at the Idria mine, proper, in the company's grounds. Among the company's mines are the Idria, San Carlos, Aurora, Molino, Washington, Benada and Victorener. The largest amount of work has been done in the Idria mine, proper. San Carlos has produced well and been quite extensively worked. The San Carlos mine is several hundred feet higher than Mount Diablo, and is the highest point in the range except San Benito, (misnamed on the maps of California, being named Panoche Peak,) which is quite near. San Carlos is 4,977 feet high, and Mount Diablo 3,876, and San Benito Peak still higher than San Carlos. The workings consist of tunnels, with communications by shafts from level to level, to a depth of 600 feet. The company are now engaged in erecting machinery, probably the heaviest of its character in the State, for the purpose of sinking 500 or 600 feet lower. The new machinery is being put up at a point 1,000 feet under ground. In the Idria (proper) the underground work will probably measure four miles. The mine has been producing constantly since 1857. The process for reducing the ore consists of thoroughly roasting the ore in furnaces holding from 50 to 60 tons, and the vapors (quicksilver at a temperature above 50° of heat passing off in vapor,) condensed in large brick condensers, where it comes in contact with cold air. These condensers consist of a series of 12 to 16 large brick compartments, having a single opening in each wall, through which the smoke of the fuel and the vapors of the ore pass finding their way to the chimney, before reaching which the quicksilver is supposed to be precipitated, and the wood smoke finds its way out. The chimney alone is an institution worthy of note. It is built on the slope of the hill on which it rests, and is large enough to admit the passage of a man comfortably from top to bottom. The quicksilver rarely if ever reaches the top of the chimney. In no other part of the world has cinnabar, the common ore of quicksilver, been found so widely disseminated as in California. Outside of California, and until the California discoveries, the world had depended almost wholly upon the old Almaden, of Spain, and the Idria, of Austria, for this important requisite in the collection of its metallic wealth. The event of the California discoveries should be appreciated by every individual who uses a pound of quicksilver, for there are thousands of gold and silver mines that could never have been profitably worked but for these discoveries. Prof. Von Cotta, in his book on ore deposits, says, "That even platinum is not so equally distributed as this metal, and it may be asked how it happens that this metal is collected in such masses at some localities." "After platinum mercury is the rarest metal used in the arts and manufactures." The old Almaden quicksilver mines of Spain, it is well established, was worked seven hundred years before the Christian era, and is now still producing perhaps the largest amount of any in the world. Cases of salivation are frequent among the men engaged about the furnaces, caused by inhaling the mercurial vapors. In some portions of the reducing works the laborers receive one dollar per hour for their services. These men handle the ore in a heated state, and tie heavy bandages over their mouths and noses to prevent the inhalation of mercurial fumes, and even with this precaution they are frequently salivated. A visit to these mines will repay one amply for their trouble.—*Fresno Examiner.*

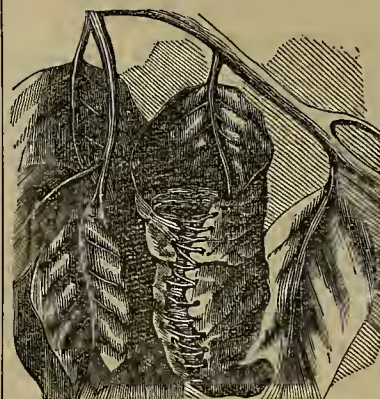
ENGLISH MANUFACTURERS LOOKING AMERICANWARDS.—Many English manufacturers, in view of the rapidly advancing prices of coal and labor in England, are looking to this country as a favorable place for re-locating their works—especially such as manufacture largely for this market. Mr. Coats, the celebrated English thread maker, has already moved his establishment to Pawtucket, R. I., where he employs three hundred persons.

The Tailor-bird.

Our own engraver has executed the accompanying cut, which enables us to illustrate an interesting fact and trait in the natural history of the Tailor-bird, which we find in the *Illustrated Monthly*.

"The ingenuity and skill displayed by many of the lower animals in the construction of their homes is so marked and marvellous, that we do not wonder that the enthusiastic naturalist should be led to believe that they are possessed of reasoning faculties similar to man's. The spider's web, the beaver's dam, and, more remarkable than either of these, the endless varieties of bird's nests, all tend to prove that what we call the *instinct* of animals is as mysterious a mental quality as the *reason* of man.

The illustration here given represents the leafy nest of the Southern Tailor-bird; and, if it appears more wonderful in its construction than the queer little mud cabins of the barn-swallow or the swinging nest of the oriole, it is only that by its resemblance to the work of the human hand we are the better able to compre-



THE TAILOR-BIRD'S NEST.

hend the difficulties attending its construction.

With only its beak and claws, this expert little artisan obtains from some vine or sallows bark the long thread with which the edges of the leaf are stitched together; and, as the nest is located at the end of a long swinging branch, the sewing must be done by the beak alone, as the claws are needed to grasp the limb above; and yet this is only half the work, for, after the leafy shell is finished, it must be lined with a closely-woven and braided cushion, that the eggs and young may be safely housed.

It is not difficult for us to understand how a child, under the guidance and direction of its parent, may at last succeed in producing a work as perfect in design and finish as that which served as a pattern; he sees where the first attempt was wrong, and improves upon it in the second. But not so with the young Tailor-bird. No sooner is it able to fly than it leaves the nest, of which it has seen only the interior, and with no lesson or advice, at once seeks a mate no wiser than itself; and together they two build a new nest, so perfect in finish, and similar in design to the one they had left, that it is hard to believe that the old home was not transported to a new branch. The child had *reason*; the bird, *instinct*."

CHEAPER SEWING MACHINES.—There appears to be a prospect that the price of sewing machines will be reduced. The patent for the Wheeler & Wilson machine will shortly expire. During the last session of Congress there were several unsuccessful efforts made to have it extended, and the application for an extension is still before the Senate Committee on Patents, with little prospect of its being reported this Winter. In case the application for an extension is defeated, it is thought the price of sewing machines will be brought down to \$20 or \$25. In the testimony filed before the Committee, given by skilled machinists, it is stated that the average cost of manufacturing sewing machines is \$7 to \$12. This patent is owned by what is known as the sewing machine combination, but the application for extension of the patent is in the name of A. B. Wilson. Many of the smaller machine companies oppose the extension. There are, before the Committee, petitions signed by over twenty thousand persons, many of whom have from one to twenty machines in operation in manufacturing establishments, asking that the extension be refused. The old companies have made millions upon millions upon their patents, and it is now time that their monopolies should be done away with, and the public benefitted by throwing the business of making and selling machines open to competition. The question seems hardly to admit of argument.—*Call.*

THE SIGNAL SERVICE AND THE FISHERIES.—General Myer, the head of the United States Signal Service, has intimated his desire to promote the interests of fishermen through the operations of his department, as we learn from the Gloucester Telegraph, by establishing stations which shall not only notify the fishermen of changes in the weather, but also of the movements of fish, such as mackerel, herring, etc., alongshore. The idea seems to be an excellent one.

Silver and Silver Coinage.

In the annual report of the Secretary of the Treasury, says the *Territorial Enterprise*, it is suggested that general silver coinage be suspended throughout the United States, owing to the depreciation in the value of silver compared with gold, and that silver dollars alone be coined hereafter—the piece to correspond in weight and fineness to the Mexican dollar, which is largely used, and at a premium, in our trade with China and Japan. During the past ten years the value of silver in relation to gold has decreased three per cent. To what extent this depreciation is due to the silver product of Nevada, we are not advised; but it is remarkable that the decline commenced with the opening of the Comstock mines, and has steadily gone down with the increased yield of this great deposit. It is a curious fact that when the great gold discoveries of twenty years ago were made economists like Cobden and Chevalier thought that silver would replace gold as the standard money of the world. Holland acted upon the theory, and made silver the sole standard currency.

Now, on the other hand, gold has beaten silver out of the field, so that—with the exception of Holland—no country places silver on equality even with gold as money. Silver is now quoted at lower rates in the English markets, according to the *London Economist*, than it has been for twenty years. "Ten years ago," says the writer, "the price was 62½d. per ounce standard; a year ago it was 61d.; it now is 59½d." The Secretary of the Treasury attributes the decline of the past year to certain changes in the standard money of Germany. So, also, does the *Economist*. It directs attention to the fact that, before the late changes, silver was in all the States of Germany the sole legal tender; gold was only an article of merchandise; the greater part of the circulation is consequently silver. But, by the recent law of the new empire, gold is already a legal tender as well as silver. Before long, according to the announced policy of the Imperial Government, it will supersede silver. Instead of there being various silver standards, as until lately, in the several States throughout Germany, there will be one imperial gold standard. In consequence no one likes to keep much silver; every individual and still more every bank, tries to "pass on" that metal; every one sees that silver will soon be demonetized; that every one who holds a large stock of it when it is demonetized will be a heavy loser. "All Germany," says the *Economist*, "which has now principally a silver currency, is before long to have principally a gold currency. Now Germany is a country of great extent, great trade, and great wealth, and a country where banking is but little developed, and where the percentage, so to speak, of coin to wealth is, if measured by an English standard, enormous.

To change the main actual "coin," of such a country from one metal to another, will cause a permanent use, on a large scale, of the metal which is chosen, and a temporary setting free on a large scale also, of the metal which is abandoned." The late decline in the price of silver may be due, as assumed by Secretary Boutwell, to the action of Germany; but the depreciation of the preceding nine years must be traced to another cause. What can this cause have been but an increased yield of silver? Until 1860 but little silver was produced in the United States. Since that time, Nevada, Colorado, Idaho and Montana have given to the world silver to the value of about \$150,000,000, while the gold yields of California and Australia have decreased yearly. As the product of silver has increased during the past ten years while the gold product has decreased, it is but natural that the relative value of the two metals in the money markets of the world should have been correspondingly affected. But the mine-owners of Nevada need not be alarmed. Silver will always be a marketable commodity, even should it be used somewhat less in coinage. Although Nevada will turn out nearly one thousand tons of silver bullion next year, it will produce an amount of gold but a fraction less in value, and it is probable that the relative value of gold and silver will not change materially for many years to come.

I. L. D.—Under the above peculiar heading the *Carson Appeal* gives the following item: We were allowed by Mr. Whitehill, State Mineralogist, at our earnest solicitation, to publish the following item of his travels through Southern Nevada on his exploring tour in the Summer of last year. Near the summit of the Clarke mountains, in the Kingdon range, on its eastern slope, there is a limestone cliff with smooth surface, almost perpendicular, and 250 feet in height. About 100 feet from the base of the cliff, on its front, are engraved the above characters of immense size, 60 feet high and 2½ deep which may be seen at a great distance. There is no tradition respecting these characters. The crosses and the Roman letters seem, however, to argue the workmanship of Jesuit missionaries. A mission was established at the mouth of the Gila river in 1633, and also at various points in New Mexico, by Eusebius Kino. There is also an old map extant representing forty towns and villages in Arizona. Probably the letters were made by the followers of the good priests while making some settlements in the vicinity, in their endeavors to Christianize the Indians; or while passing by on a tour to California, where permanent missions had been established.

USEFUL INFORMATION.

How to Varnish.

Varnishing should always be done in a warm atmosphere 72 deg., or as warm as you can comfortably work in. In a reduced atmosphere water is always present, an invisible dew, and will give to varnish a milky and clouded appearance, even on a fine summer day this may happen, and the only way to obviate the difficulty is to heat to 72 degs., sufficient to keep the moisture suspended in the air until the solvent has entirely evaporated leaving the gums in a thin glossy coat; the brilliancy and defensive value of the varnish will depend upon this.

To produce a brilliant surface have your work in the varnish room a few hours before varnishing that it may acquire the same temperature as the atmosphere. Smooth the surface, wash off and wipe dry with a camels skin or piece of old silk, removing all traces of dust, moisture or grease—no oil or grease should be allowed or used—have your brush as large as the nature of the work will admit—soft, clean and free from loose hair. Lift the varnish lightly with the brush, charging moderately, and apply a thin coat. Begin at a little distance from the edge or at the inside of the panel, highest point first, and work to the outside edge in direct, long, rapid, and steady strokes with a moderate pressure, sparingly upon the edges and angles, working alternately toward the ends; spread evenly and quickly the thickness of paper and draw lightly for finish, in this great care and watchfulness are required.

After varnishing expose your work to the heat of the sun or keep in heat free from dust and draught. Cold air and draught passing over varnish will dull the surface wherever they extend. If the varnish should so become chilled, the brilliancy and clearness may be restored by giving the surface another thin coat, and immediately hold near the fire to dissolve the chilled coat but not too near to blister.

THE WATER TELESCOPE.—For seeing under water, consist of a tube to enable a person looking over the gunwale of a boat to rest the head on one end, while the other is below the surface of the water; the upper end being so formed that the head may rest on it, both eyes seeing freely into the tube. Into the lower end is fixed (water-tight) a plate of glass, which, when used, is to be kept under the surface of the water; so that the spectator, looking down the tube, sees all objects at the bottom whose reflective powers are able to send off rays of sufficient intensity to be impressed on the retina, after entering the loss of light caused by the absorbing power of the water. Light in passing through pure sea-water, loses half its intensity for each 15 feet through which it passes, says Sir John Leslie. In clear water the bottom may thus be seen at the depth of twelve fathoms. This contrivance is much used in scuba diving along the northern and western islands of Great Britain, where, sometimes in the form of an ordinary washing-tub with a piece of glass fixed in its bottom, the shot seal is looked for, and the grappling-hook let down to bring him to the surface. The Norwegian fisherman also often use this telescope when their anchors get into foul ground, or their cables warped on a roadstead.

MOTION OF THE EYE.—On coming into a room, we think we see the whole side of it at once—the pictures, the cornice, the chairs—but we are deceived; being unconscious of the Motions of the Eye, and that each object is rapidly, but successively, presented to it. It is easy to show that if the eye were steady, vision would be quickly lost; that all those objects which are distinct and brilliant, are so from the motion of the eye; that they would disappear if it were otherwise. For example, let us fix the eye on one point—a thing difficult to do, owing to the very disposition to motion in the eye. When we have done so, we shall find that the whole scene becomes more and more obscure, and finally vanishes. If we then change the direction of the eye but ever so little, at once the whole scene will be again perfect before us. These phenomena are consequent upon the retina being subject to exhaustion, by the lights, shades, and colors of objects continuing to strike upon the same relative parts, and thus exhausting the nerve; but when the eye shifts, there is a new exercise of the nerve.

CULTIVATE HABITS OF CAREFUL OBSERVATION.—Prof. Buckland in a late address asked his audience, which he supposed contained young men who one day would be among the rulers and chief men of our land—to see for themselves, to hear all they could, but not accept as gospel what they heard till they had proved it. He wished to encourage a habit of examination and inquiry among young and old, and gave amusing instances of attempts that had been made to impose on himself. A "monster," said to have been shot in the woods of Japan, was brought to him, and a large sum asked for it. A hideous wretch it was when produced, but he soon discovered that it was made of gutta serena, and was ingeniously fitted with eyes, teeth, nails etc., from various incongruous animals.

USEFUL IF EFFECTIVE.—A citizen of Bedford county, Va., has invented a machine to melt the snow and ice on a railroad track as the train runs, by means of a flame of efficient intensity to produce the result instantly. The invention is just in time, if effective.

POWER OF THE EYE IN VIEWING MINUTE OBJECTS.—The smallest particle of a white substance distinguishable by the naked eye upon a black ground, or of a black substance upon a white ground, is about the 1-400th of an inch square. It is possible, by the closest attention, and by the most favorable direction of light, to recognize particles that are only 1-540th of an inch square; but without sharpness or certainty. But particles which strongly reflect light may be distinctly seen, when not half the size of the least of the foregoing; thus, gold dust of the fineness of 1-1125th of an inch may be discerned with the naked eye in common daylight. When particles that cannot be distinguished by themselves with the naked eye, are placed in a row, they become visible; and hence the delicacy of vision is greater for lines than for single particles. Thus, opaque threads of no more than 1-4900th of an inch across, or about half the diameter of the silkworm's fibre, may be discerned with the naked eye when they are held towards the light.—CARPENTER'S *Animal Physiology*.

BOGUS CHINESE PEARLS.—Minute descriptions have been written of the manner in which the Chinese claim that they obtain real pearls by placing foreign substances within the shell of the fish which produces pearls, when the animal, unable to get rid of it, makes a deposit of "pearl" matter around it, so that it becomes a real pearl. Professor Buckland has recently shown that this is possibly a deception which has been quite successfully practiced upon the "outside barbarians." During a recent lecture he exhibited a large pearl shell in which were seven or eight images of the God Buddha, coated with a secretion of mother of pearl.

The professor said it was claimed by the person who presented the shell that the oyster deposits this secretion itself, when Master John Chinaman inserts these images. Mr. Buckland was sceptical, but said nothing till he had proved that the secretion was as much artificial as the little images themselves. It was a solution of the real mother of pearl, artificially applied and painted over the images.

HOW THE DIAMOND CUTS GLASS.—Dr. Wallaston ascertained that the parts of the glass to which the diamond is applied are forced asunder, as by a wedge, to a most minute distance, without being removed; so that a superficial continuous crack is made from one end of the intended cut to the other. After this, any small force applied to one extremity is sufficient to extend this crack through all the whole substance and across the glass; for since the strain at each instant in the progress of the crack is confined nearly to a mathematical point at the bottom of the fissure, the effort necessary for carrying it through is proportionally small. Dr. Wallaston found by trial that the cut caused by the mere passage of the diamond need not penetrate so much as the two-hundredth part of an inch. He found also that other mineral bodies, recently ground into the same form, are capable of cutting glass; but they cannot long retain that power, from want of the requisite hardness.

FORCE OF LIGHTNING.—In August, 1846, St. George's church, at Leicester, England, was entirely destroyed by the effects of a thunder-storm! The steeple was hurst asunder, and parts of it were blown thirty feet; while the vane-rod and top part of the spire fell perpendicularly down, carrying with it every floor in the tower. Mr. Highton, in comparing the power of this discharge of lightning with some known mechanical force, states, that one hundred tons of stone were blown a distance of thirty feet in three seconds; consequently a 12,220 horse-power engine would have been required to resist the effects of this single flash.

SUBSTANCES THAT MOST RESIST THE ACTION OF COLD.—Pure alcohol, ether, bisulphide of carbon, and glycerine do not freeze at any temperature to which they have ever yet been subjected. Ammonia freezes at about 45° below Fah. zero, and pure nitric acid at about the same point. Mercury freezes at -39° Fah., sulphuric acid and some other substances require also a temperature far below the zero of Fahrenheit scale to produce solidification. The union of any liquid, which by itself remains fluid at a very low temperature, with water, will raise its freezing point.

THE PILOT FISH.—That little fellow, crossed with blue stripes, that is said to pilot the shark to its prey is really no pilot at all. The idea is a delusion. He is no more a pilot to a shark than the starling is to the sheep. Do we think the starling is in love with the sheep that it settles on its back? No; it is then busily ridding the sheep of its natural tormentors—its Norfolk Howards. Such an office does the so-called pilot fish fill in regard to the shark.

UTILIZING COTTON WASTE.—The experiment at Westville, Conn., of a factory for the extracting of oil from cotton waste has proved a decided success. By this process old grimy, greasy rags and waste cotton are rendered perfectly pure, odorless and merchantable. The waste of the Connecticut and Massachusetts cotton mills will more than supply the Westville Oil Extracting Works with materials.

NEW USE FOR MICA. A new use has been found for mica. It is now attracting public attention as a material for roofing buildings, for which purpose it has been found to be peculiarly adapted.

GOOD HEALTH.

The Blood.

Blood, in its ordinary condition, is always fluid; withdrawn from the vessels of the living animal and left for a time to itself, it separates into two portions, a semi-solid mass, and a liquid portion, in which the mass floats; the solid part is called the clot. This phenomenon (the formation of the clot) is due to the presence of fibrine in the blood; it is held in solution in the serum during life; but when this loses its influence over it, it solidifies, enclosing with it the globules; and thus forming the red gelatinous mass called the clot.

Blood is the special agent of nutrition, and is the general restorer of what is lost. But in addition it is proved, by simple experiments in blood-letting, and of transfusion, to form an essential stimulus for the performance of the functions of life. By severe loss of blood we become enfeebled and seemingly dead; but, if, before this happens, the blood of another animal be transfused into the veins of the suffering individual, the vitality is restored.

The importance of the globules is also proved by the same experiment; for if simple serum be so transfused, death takes place. The fibrine of the blood also plays an important part; for when the blood is deprived of its fibrine and injected into the veins of a dog, the animal dies with symptoms resembling those of putrid liver. The influence of the blood over nutrition may also be readily demonstrated. Withdraw the blood more or less from an organ, and it gradually wastes away in proportion to the quantity withdrawn, while, on the contrary, the greater size of the muscles in those who employ them actively, and hence draw to them a larger amount of blood. To the important functions and uses of the blood, some physiologists go so far as to assert that "the life is blood," in that the entire principle of life exists in the blood.

A morbid condition of the blood is the fruitful source of many diseases. Cleanse the vitiated blood whenever you find its impurities bursting through the skin in pimples, eruptions or sores; cleanse it when you find it is obstructed and sluggish in your veins; cleanse it whenever it is foul. Keep the blood healthy and all is well; but with this vital fluid diseased, there can be no lasting health.

POISONOUS CONFECTIONERY.—If a report just presented to the Newcastle (England) town council had been available at the time Christiana Edmunds was on her trial, it might have been found useful in support of the theory of her lunacy. No one but a lunatic, it might have been urged, would take the trouble to poison confectionery and thereby incur suspicion, where there are, ready-made to hand and openly sold in shops, sweetmeats artistically coated with deadly poison. That such is the case in Newcastle-upon-Tyne, is shown by a report of Mr. Pattinson, analytical chemist, upon which the local corporation have decided to take immediate action. Mr. Pattinson says he has examined various samples of sugar confectionery sold in Newcastle, and finds that nearly the whole of the articles colored yellow and orange are so colored by chromate of lead. Out of thirty-five different kinds of sweetmeats examined, obtained from twenty different dealers, twenty-eight were colored by this poison. Some of the articles contained upwards of a tenth of a grain of metallic lead, the engaging substance being supplied to manufacturers under the names of "lemon chrome" and "orange chrome." Mr. Pattinson adds that "Some of the confectionery contained plaster of Paris to the extent of 1 1/2 per cent., besides a good deal of wheaten flour." If parents were allowed their choice, they would doubtless prefer this last named adulteration to the lead salt mentioned above.

MECHANISM OF THE BONES.—In the human skeleton there are commonly enumerated 260 bones, which present every variety of size and figure. But all these varieties may be reduced to three classes: the long and round, as the bones of the upper extremities; the broad and flat, as the bones of the skull; or the short and square, as the separate bones that compose the vertebral column. The long bones are adapted for motion, the flat for protection, and the square for motion combined with strength. Accordingly, the long bones are moulded into lengthened cylinders, and form so many levers, exquisitely constructed and combined. In the employment of the flat bones for the covering of some of the more tender and delicate organs, as the brain and spinal cord, the form of these bones adds to their strength, as in the vaulted roof of the skull; while in the construction of the vertebral column, composed of the short and square bones, which are so adjusted, as to afford a limited range of motion with a great degree of strength, so many and such opposite purposes are effected by means so simple yet so efficient, that no fabric constructed by human ingenuity approaches the perfection of this admirable piece of mechanism.

AN INTELLIGENT DRUGGIST.—It is said a Syracuse druggist recently received the following prescription, with a request to put it up:—Fix kramps—Tinct kamfire, won ounce; tinct lode-num, a little tinct hot drops, a few drops; tinct kyan peap, five cents worth; klonform a little, but not much, as it is dangerous medicine. Dose, half-teaspoonful when the kramps come on.

Nourishment in Food.

The wholesome or unwholesome character of any aliment depends, in a great measure, on the state of the digestive organs, in any given case. Sometimes, a particular kind of food is called wholesome because it produced a beneficial effect of a particular character on the system of an individual. In this case, however, it is to be considered as a medicine, and can be called wholesome only for those whose systems are in the same condition. Very often a simple aliment is made indigestible by artificial cookery. Aliments abounding in fat are unwholesome, because fat resists the operation of the gastric juice. The addition of too much spice makes many an innocent aliment injurious, because spices resist the action of the digestive organs, and produce an irritation of particular parts of the system.

In any given case, the digestive power of the individual is to be considered, in order to determine whether a particular aliment is wholesome or not. In general, we can only say, that aliment is healthy which is easily soluble, and is suited to the power of digestion of the individual; and, in order to render the aliment perfect, the nutritious parts must be mixed up with a certain quantity of innocent substance affording no nourishment, to fill the stomach; because there is no doubt that many persons injure their health by taking too much nutritious food. In this case, the nutritious parts, which cannot be dissolved, act precisely like food which is, in itself, indigestible.

It is a very mistaken idea that the nourishment in food is according to the quantity; a person may eat a great deal of some articles, and receive very little nourishment from them. The quantity of nourishment depends greatly on the aromatic flavor contained in food; and whatever is insipid to the taste is of little service to the stomach. Now, the difference between good cookery and bad cookery lies principally in the development of the flavor of our food; articles properly cooked yield the whole of it; by good cookery we make the most of every thing—by bad cookery, the least.

POWER OF MAN TO ENDURE COLD.—One who took part in a telegraphic expedition in Siberia writes as follows:—"I didn't believe that it would be possible for me to lie out in the snow, without shelter, in a temperature of even 20 deg. below zero, but I have done it once in 50 deg. below, and repeatedly in 45 deg. One of Bush's parties, in February of last year, passed the night on an open, barren steppe, with their spirit thermometer standing 78 deg. below zero, or 100 below the freezing point. Quicksilver they molded into solid bullets with four minutes' exposure to the air. It is true they did not dare to go to sleep that night, but I believe that, had they been properly fitted out with heavy furs and wolf-skin sleeping bags to tie over the head, they might have done it with perfect safety.

"I'm afraid you would think that I was availing myself of a traveler's privilege, and relating a very large 'yarn,' if I told you how comfortably I have slept on the snow in a temperature of 30 deg., 40 deg. and 45 deg. below. We are obliged to sleep in fur bags, of course, with our faces entirely covered, to take the utmost care to have our fur stockings perfectly dry; but I have slept in that way through the long Arctic nights as comfortably as ever I did in bed at home."

THE ART OF WALKING.—In a graceful human step, the heel is always raised before the foot is lifted from the ground, as if the foot were part of a wheel rolling forward; and the weight of the body supported by the muscles of the calf of the leg, rests for the time on the fore part of the foot and toes. There is then a bending of the foot in a certain degree. But where strong wooden shoes are used, or any shoe so stiff that it will not yield and allow this bending of the foot, the heel is not raised at all until the whole foot rises with it; so that the muscles of the calf are scarcely used, and, in consequence soon dwindle in size, and almost disappear. For the same reason in Paris where the streets have (few or) no side-pavements, and the ladies have to walk almost constantly on tiptoe, the great action of the muscles of the calf has given a conformation of the leg and foot, to match which the Parisian belles proudly challenge all the world—not aware, probably, that it is a defect in their city to which the peculiarity of their form is in part owing.

BISULPHIDE OF CARBON ON THE SYSTEM.—This substance is a deadly poison. Its vapor when inhaled converts the iron of the blood into sulphide of iron, causing death. It is a very volatile liquid; and its manufacture is quite dangerous from the above mentioned reasons. A vessel of it placed in a close room would cause death about as rapidly as carbonic acid or charcoal fumes. A cup full of the bisulphide placed in a tight apartment filled with grain will in a few hours kill not only every weevil but also its larva and eggs. It is a very useful substance, but at the same time, under certain conditions, an extremely dangerous one.

A correspondent of the *Scientific American* calls attention to the danger to be apprehended from the efforts now being made to free it from its very disagreeable smell, and says:—"What on earth people want to smell bisulphide of carbon for, I cannot understand. The more disagreeably it smells the better, for thereby some warning is given of its presence."



W. B. EWER..... SENIOR EDITOR.

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San Francisco:

Saturday Morning, Jan. 4, 1873.

Legal Tender Rates.—S. F., Thurs., Jan. 2.—buying, 89½; Selling, 89½.

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CALIFORNIA ART GALLERY.—The first number of which is before us, is devoted to music, drama, art and literature, and is published by Alfred Chaigneau & Co., 409 Washington street. Terms, \$5 per year. It is a very fine specimen of typography; the "heading" in particular is worthy of mention, having been made by the zincograph process, by the publishers themselves. The number contains "Mrs. Plattsware's Campaign," "Art in California," "Free Art Galleries," A sketch of Thomas Nast, a poem by J. F. Bowman and one by Chas. Warren Stoddard. "The Art Exhibition and the Gsrome," "Jottings at a Window," Local Art Notes, The Yosemite Waltz, (Music), "Is Joaquin Miller a Poet?" "Roman Recollections," "Unknown Benefactors," "Pauline Lucas Debut," Tales from the Greenroom, etc.

The zinc-chrome which accompanies the paper, is made by a new and peculiar process, a fact which our contemporaries seem to have overlooked. Too much has been expected from this first attempt, and the manner in which it is made, has not been taken in consideration. We will not attempt to criticize the skill of the artist who drew the picture, but think that in this style of printing they have done very well and made a fair beginning. The work is done by ordinary letter press printing and not by the slow and expensive process of lithography. This process is ten times as rapid and is correspondingly cheaper than regular chromo-lithography. The zincography done by this process would do credit to any journal in the United States. This manner of making and printing the picture is not generally understood, but when it is the excellence of the work will be appreciated. We look forward in future numbers to an improvement, and think they will make satisfactory progress in this new art.

Smelting on the Pacific Coast—No. 2.

A Few Hints on Making Smelting a Financial Success.

In our last issue we gave a short history of the business of smelting on this coast, its successes and failures. In this, we shall try to give a general view of the operations to be gone through with in smelting the argentiferous galena and lead ores of this coast, as well as a few hints that may assist those who propose engaging in it as a business, to avoid the errors into which others have fallen.

Of course no operation can be regarded as successful as a business

Unless it is profitable in a financial point of view, and consequently it often requires some close figuring in order to determine whether the enterprise will pay, though every facility for smelting may be obtainable and the character of the ore may be such as to make it susceptible of reduction by this process.

We shall first proceed to give the elements necessary for the success of the operation as a reducing process, and then some of the points to be observed in figuring the cost of production and the chance for profits. Of course, the first question to be answered before engaging in the erection of furnaces is, whether the

Ores to be Worked

Are susceptible of complete and satisfactory reduction by smelting. This may be answered by stating that at least in the ore should be contained 30 per cent. of metallic lead, though the greater the quantity of lead contained, the easier will be the operation, other things being equal. If the ores contain as high as forty per cent. or over, further advantages is found in the possibility of mixing in the smelt a small proportion of rich silver milling ore, if obtainable, and thus giving the bullion a higher percentage of silver.

In regard to the presence of other base metals than lead, in the ore, we would say that as a rule, they are deleterious not only to the smelting but to the appearance and value of the bullion produced. Antimony in small quantities is not, as a rule, very injurious, as it passes off in great part in the furnace, carrying with it, however, some portion of the silver. Copper in small quantities gives the bullion a hard nature and dark appearance.

Arsenic goes off in fumes, leaving a very small percentage in the bullion, but has the disadvantage of being very injurious to the workmen. These are the three metals most generally found in the argentiferous lead ores of this coast.

Self-Fluxing Ores.

The next thing to be determined is whether the ore is self-fluxing i. e. whether the matrix is sufficiently fusible at ordinary furnace temperature to liquify the whole mass. 2d, whether there is enough oxides and metallic iron in it to thoroughly reduce the lead to metallic form, when in contact with the charcoal of the furnace. This can be most easily determined by a small blast furnace which should always be attached to the works, its construction is but a trifling expense, and the convenience of one is very great; a single twyer is only necessary and the results are always of a practical character, and though chemical analysis of the ores are sometimes necessary to show what their properties are, and what they lack, in case the small furnace shows them to be not self-fluxing, this furnace obviates their use to a great extent.

In case the ore is not easily fusible, it may be made so by the addition of hematite (red oxide of iron) found generally all over the Pacific coast, which being easily melted and holding heat well, generally effects the desirable object, besides being also of value in another manner to be described hereafter; or sometimes the addition of salt or alkali will effect the desired object. In case the

Ore is Not Self-Reducing

That is, does not contain oxide enough to reduce the lead in the ore to metallic form in conjunction with the charcoal of the furnace, it may be made so either by roasting the galena so as to oxidize the ore, or by partly oxidizing the ore and then adding the hematite or metallic scrap iron to form with the excess of sulphur in the ore, sulphide of iron, which is carried off in the slag.

We will next try and form an idea as to whether the operation will be successful

In a Financial Point of View.

Of course this depends so much on the particular circumstances governing each case that only some general rules to be considered, can be given; 1st, other things being equal, it is always more economical to run several furnaces, than one; 2d, a loss of 5 to 10 per cent. must be expected on both lead and silver from assay results. The more silver and gold in the bullion the greater percentage can be obtained the cost of refining being no greater for bullion containing 500 ozs. of silver per ton, than bullion containing 100 ozs. per ton. In regard to running expenses, it takes from 20 to 40 bushels of ordinary charcoal to smelt

one ton of lead ore; on an average 30 bushels might be calculated. In making calculations the following must be regarded as outlay.

Cost of ore extraction; cost of transportation to works; cost of crushing; cost of fluxes; cost of bullion transportation to market; wear and tear of works; cost of charcoal, 30 bushels per ton; cost of three sets of hands, three each set for each fifteen ton blast furnace, i. e., one feeder, 1 smelter and 1 helper; 2 engineers, at 12 hour shifts; cost of wood for engine; one blacksmith for sharpening bars, etc. Against amount of bullion less ten per cent. on average assay, at from \$1 per oz. silver to \$1.20, according to amount of ozs. per 2,000 lbs., also 4½ to 5 cents a pound for lead.

This estimate is for 15 ton blast furnaces, the most economical in our estimation. They ought to have an inside diameter of 22 to 24 inches, with 12 to 15 feet fall from feed hold to twyers, a single front, two side and back twyers, or two back and two side twyers, and with blast direct into furnaces. Arched sides to enable burnt out stones to be removed; single tap hole and slag spout. This furnace, with 48 inches hearth, will smelt 15 tons of material a day; that is 12 tons of lead ore, 3 tons of iron ore (flux), lead slags and rich silver ore, etc., and properly managed, will do it well. In regard to the actual

Working of Such a Furnace

We do not pretend to attempt to give any general rules except this advice. To obtain some one thoroughly and practically acquainted with it as superintendent, and man that know their business to act under him, and be assured that they will save much money, anxiety and vexation, even if the salaries paid are higher. The following hints may be useful. In building the furnaces, the spaces between the furnace and the lining should be filled with fire sand, to fill any cracks that may be made in the lining. After being built the furnaces should have full time to dry; water lined twyers are most economical. In starting the furnace great care should be taken to heat it very thoroughly, but gradually. For a number of days a very light fire should be kept in it, and 24 hours before charging the fire should be kept at full force, the blast from the twyers being as strong as when the ore is being melted. A metallic bottom should be obtained for the furnace, if possible, by putting a ton or so of lead or bullion in the bottom. This keeps the bottom covered with molten metal and prevents freezing below the twyers. Half charges should be put into the furnace for the first 12 hours, after that, if everything is right, full charges may be made.

In charging, care should always be taken to charge in the centre of the furnace, or otherwise too much work will be given to some particular twyer; unless, in order to cool some particular portion of the furnace that shows signs of getting too hot and burning out, you charge over that particular point.

We consider it a matter of little importance whether one bushel of charcoal and small charges of ore are put into the furnace, or two bushels of coal and double the quantity of ore is used to each charge; though in large furnaces we are inclined to think the latter the preferable plan.

In Preparing the Ore

For furnace reduction, if it is found necessary to roast it, it can be done in kilns, cut into the sides of a hill and the wood and ore properly arranged to carry a draught of air through the mass; the sulphur of the ore will generally furnish a great portion of the fuel needed, thus making the operation comparatively inexpensive. Before going into the furnace the ore should be broken into pieces the size of hens' eggs, which permits the draught to pass readily through and the heat to penetrate and melt it rapidly. Great care should always be taken to

Keep the Furnace Free

So that the blast passes easily through the ore; this is perhaps the most important point in furnace management. As long as the fumes from the furnace are solid and dense and pour out regularly, the slag liquid, and running copiously, and no impediment offered to the bars that the smelter puts into the furnace from time to time, to be sure that it is not clogging; everything is as it should be; but if the blast is intercepted and the other things right, the trouble is above the twyers and consequently not to be got at so easily, and only to be removed by some change in the charging, which should be increased in flux and fuel and lessened in ore until this difficulty is removed. In case the slag is not as thin as it should be, more flux should be used, and if the furnace is clogged below the twyers it must be barred out by the workmen. As a general rule the furnace at the feed hole should be kept "dead," i. e., with no visible flames at that point, in order to avoid loss by fumes. Sometimes, however, to burn out obstructions above the twyers the fire is brought to such a point and the furnace charged so little as to permit the flame to be seen at the feed hole.

We have not mentioned reverberatory furnaces as they have been but little used on this coast, the labor being greater to reduce the same amount of ore by them and the blast consequently having the preference.

In conclusion we would say that in our opinion when the people of this coast have obtained the same experience in smelting as they have in amalgamating, and railroads reduce rates so as to reduce the price of fuel in remote regions, smelting will be not only profitable to a few, but will furnish a living to thousands, and many mines now deemed worthless will be made of great value to their owners and to the country generally. At some future time we

may discuss the propriety of refining argentiferous lead bullion at this place it is manufactured.

A Very Unusual Mineral.

EDITORS PRESS:—In presenting you with a sample of the very rare mineral—the "Molybdate of lead"—(sent by Captain John Tonkin from the Tecoma mine, near Buel City, Nevada, for examination,) it may be interesting and valuable to many of your readers to know its principal characteristics, and general comportment before the blowpipe, etc., some of which are new, and others not in strict accordance with book records.

It has been found of various colors, from orange yellow to aurora red, and from wax yellow to gray and brown; these samples are, for the greater part, bright amber yellow, certain portions being changed by oxides of iron, to snuff-color; the amber parts are crystallized either into irregular tables, which lie at all angles, or as very flat, four-sided prisms, of strictly lamellar structure, which may be cloven with the greatest ease, parallel to their base, to thin scales, whilst the whole stone is so soft and friable that it may be crumbled between the fingers more like an artificial drug than a natural mineral.

When heated, it first decrepitates into very numerous thin scales, which on increase of heat becomes of a dark, wax yellow, (returning as before to pale amber yellow when cold) on the temperature being still further increased it fuses into a light sulphur yellow mass.

Fluxed with carbonate of soda it may be smelted on charcoal, in the blowpipe's yellow flame, when about half its weight of lead will be reduced to one or more buttons, whilst the molybdic acid will pass into the coal, this is similar to tungstic acid, with the difference, that after the removal of the lead, the molybdenum may be oxidized before the blue flame, to coat the surface with its copper colored oxides.

When fused with carbonate of soda in platinum wire, it forms a limpid molten glass, which becomes milk white when cold. This bead when fused on charcoal in or before the blowpipe's flame, passes into the coal and the red oxides may be made to disappear, as best seen by a lens.

Fused with borax in platinum wire before the point of the blue flame, the resultant glass is dark yellow when hot, and of beautiful opaline appearance when cold; but when an excessive quantity is added, the glass when hot is dark red, then yellow, and when quite cold, a bluish-gray opal. This manner in which this opaline appearance closes in from the wire to the center of bead, during the cooling, is very characteristic. Merlet's moist method may also be resorted to for the detection of molybdic acid in this mineral, as follows:

Fuse the powdered sample with nitre in a platinum spoon or crucible, then dissolve this molybdate of potash thus formed, in water boiled over a spirit lamp (or hot stove) filter or pour the clear liquor into a porcelain dish (or saucer) then, after placing a small piece of bright copper therein, add to the boiling solution just sufficient hydrochloric acid to dissolve some of the copper, which will form a general light green solution, and after some time (if molybdic acid is present) just immediately over and around the metallic copper, its characteristic indigo blue. This is a very exacting test for a very small quantity,

J. S. PHILLIPS, M. E.

San Francisco, Dec. 31, 1872.

Cheap Coal.

Notwithstanding the extensive deposits of coal in the neighborhood of Coos Bay and elsewhere on our coast, the citizens of San Francisco pay pretty high prices for coal. The only three mines shipping coal from that district to this city at present are the Eastport, Newport and Hardy. Some comes from Mount Diablo, and considerable is brought here from Sydney and from England. The reported discovery of coal in the vicinity of Temecula, in San Diego county, has been confirmed, and several claims have been taken up under the new law.

If the coal is mined systematically and the business carried on in a more extensive manner than it is at present, we have little doubt but that it will be a profitable investment. The coal companies at present at work pay regular monthly dividends and are very profitable institutions to the stockholders. In fact the greatest drawback to our manufacturing interests in this city is the great scarcity and high price of fuel. There are known to be extensive deposits of coal all over this coast and still many of the places remain even unprotected. It seems rather peculiar that while coal mining here has proved so successful, financially, where the mines have been developed, that no more capital has been invested in the business. Let us have cheap coal by all means and plenty of it. It will help build up our manufacturing interests, be of the utmost benefit to many poor families and be as important a thing for the welfare of the city as can be done.

PATENTS & INVENTIONS.

Telegraphic List of U. S. Patents Issued to Pacific Coast Inventors.

REPORTED OFFICIALLY FOR THE MINING AND SCIENTIFIC PRESS, DEWEY & CO., PUBLISHERS AND U. S. AND FOREIGN PATENT AGENTS.]

By Special Dispatch, Dated Washington, D. C., Dec. 31st, 1872.

For WEEK ENDING DECEMBER 17TH, 1872.

CHURN.—James W. F. How, Douglas Co., Oregon.

SAW-SHARPENING SWAGE.—Alfred J. Hinds and James S. Howe, Santa Cruz, Cal.

THRESHING MACHINE.—James T. Watkins, Santa Clara, Cal.

PORTABLE WATER HEATER.—John S. Woolsey, Gilroy, Cal.

MINERS' SAFETY CANDLESTICK.—Theodore A. Washburn, Gold Hill, Nevada.

BED BOTTOM.—David P. Mahan, Antioch, Cal.

REISSUE.

HYDRAULIC MINING APPARATUS.—Frank H. Fisher, Nevada City, Cal.

The patents are not ready for delivery by the Patent Office until some 14 days after the date of issue.

NOTE.—Copies of U. S. and Foreign Patents furnished by DEWEY & CO., in the shortest time possible (by telegraph or otherwise) at the lowest rates. All patent business for Pacific coast inventors transacted with greater security and in much less time than by any other agency.

Eclipse Gold Mine, Inyo County, Cal.

Eds. Press:—Naturally feeling some little interest in the welfare of this mine, I have from time to time, read the *London Mining Journal* and other papers relating to it, and at last seeing in the *Inyo Independent* Mr. Polkinghorn's reply to Tamblin's remarks on the mine, inserted in former, and judging from the tenor of same, that many may run away with the idea that the mine never can be made profitable, I beg to say, from my knowledge of the property, to those interested, that I consider the Eclipse with water-power of large capacity for milling purposes, or such as I understand the company are in possession of, second to no gold mine on the Pacific Coast, if handled in its management by parties who thoroughly understand both mining and milling such ore; but to think for a moment, that anyone accustomed to pick and gad is a fit manager, is decidedly wrong, and the like is too often the cause of such failures, as made in this mine. It is to be very much regretted that such is also too frequently the case in foreign mines, especially where the character of the ore differs so much from home mines, or to that which the parties sent to manage are accustomed to. The process at the mill, and assorting or separating the ore in the mine, not only bothers, but make many a good man of experience, after doing his best, think he has a great deal to learn to treat it right; hence, permit me to ask your numerous readers, where does the good lay in a stranger to such ores.

I am fully convinced if both managers engaged in this mine, prior to the present one, could and would speak the truth in regard to it, they would admit that they knew but little of the component parts of the Eclipse Lode—what to save for milling or smelting, or which to throw away—in case at any time a portion of the lode should be minus both gold and silver. And not being conversant with that part containing base metal makes it still worse, being detrimental to amalgamation in saving the precious ore. If such is not separated and thrown aside whilst breaking the ore underground, it never can be done after, to any advantage of moment. This important point being elighted or overlooked was the cause, no doubt, in a great measure of the rock paying so much less than the average made by the old company.

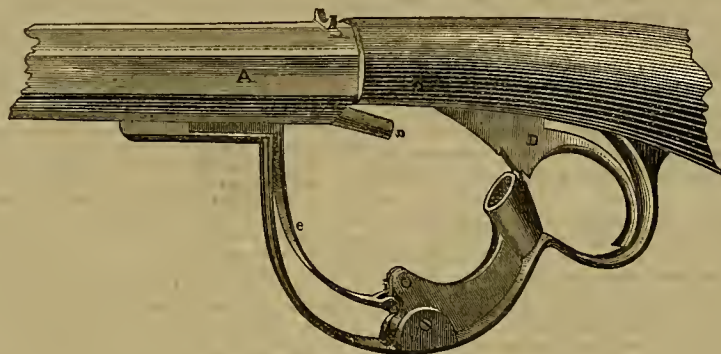
I assure you at the time of my leaving the present company, that the pile of ore at the mill, some eighty tons or more, taken out of the mine long before the purchase of the property, by the present owners, would have paid close on \$25 per ton, if treated rightly in melting; this yield being the lowest ever made from the same ore taken from the same pile and dump. My full impression always has been, and is yet, in fact, that in shape of reserves there still remain in the mine, large quantities of the same kind of ore. After my leaving the property, I can't vouch for anything poor Trellas, or his foreman Tamblin did. They might have made a bad mixture of the ore in breaking it, and I think more than likely they did so. At all events, permitting me to speak plain, I attribute the failure of the Eclipse entirely to bad management on the mine, and I do hope that the present manager, Captain Jones, will repair to the company the great waste occasioned by it. The mine, with its large and highly metalliferous lode, I have looked on to be very valuable, though knowing it would take capital to bring it out; but the company, having perfected that great desideratum, water-power, should now especially make a desperate effort for another trial, under different management, as in their ultimate success I have the greatest faith.

JOSEPH ENDREY.

Hendee's Patent Gun Lock.

The accompanying cut shows an improved gun lock, the invention of Edwin B. Hendee, which consists of a cock or hammer and trigger, constructed and arranged to operate in connection with each other so as to dispense with the use of the tumbler, sear and sear-spring, heretofore in use. The ordinary breech-piece of a gun, which fits against the under portion of the stock, is extended and the guard is secured to it. The nipple, *a*, communicates with the chamber in the barrel from the under side, as shown, being secured in a proper sized hole, which is made at any angle through the breech of the barrel near the forward part of the guard. The hammer, *C*, is hinged to the guard between two lugs, so that when it stands vertical its striking face will bear upon the nipple, *a*.

A strong steel spring, *e*, is connected to its

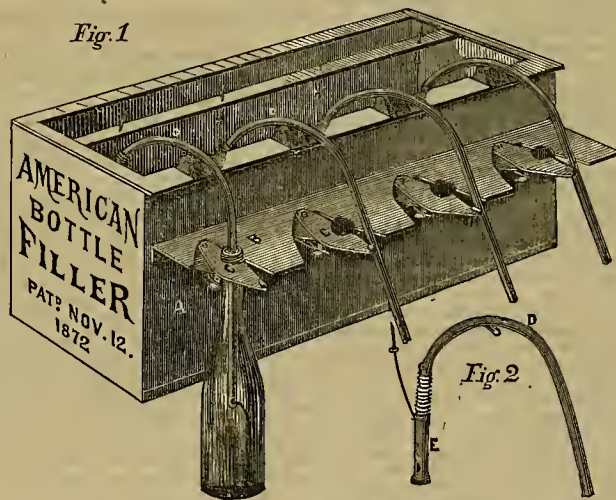


HENDEE'S PATENT GUN LOCK.

lower end by means of a link, as shown, and is bent so as to be parallel with the guard, its opposite end being secured between the guard and gun-barrel, *a*, or stock. Across the upper face of the hammer is a groove or channel, which serves to catch the half-cock notch. The trigger, *D*, is hinged to the plate above the hammer, and is held by a small rivet, at the proper angle, the finger-piece of the trigger being formed at the opposite end. In the face of this trigger, *D*, which is next to the hammer,

when the cover is off. The cap being entirely below the gun, the eye will be protected from defective caps or flying pieces. The hammer can readily be brought to a full cock while the gun is in position to be fired, and the gun then fired very quickly, especially when provided with a self-loading device. The parts, being outside, are easily cleaned and kept in order. This lock can be applied to arms of all descriptions. Parties desiring further information can address Mrs.

Fig. 1



THE AMERICAN BOTTLE FILLER.

is a peculiarly shaped recess, into which the grooved end of the hammer, *C*, enters when drawn back, and forms the half-cock, in which position the groove in the end of the hammer, *C*, and the recess in the face of the trigger, *D*, with their projecting parts, form a dovetail which holds the hammer, *C*, firmly, and from which position the hammer will not be released by drawing upon the trigger.

Just back of the recess, on the trigger, *D*, is a projection which is slightly curved backward, so that the hammer can be drawn past it and catch at the full cock on its concave side, the point of the projection entering the groove in the hammer, *C*, from which the hammer can be readily released by drawing backward on the trigger, *D*, the reactionary force of the spring, *e*, causing the hammer to strike the nipple, *a*, with the force necessary to explode the cap. In order to protect the lock from the weather, and remove every possibility of accident from carelessness in handling or otherwise, a cap or cover is provided, which is made of a suitable shape to slip over the guard, and thus enclose the entire lock. This cap can be removed in

M. J. Hendee, widow of the patentee, room 45, No. 314 Bush street, in this city.

PERSONAL.—Mr. O. H. McKee, for several years last past chief of the Mining Claims Division, General Land Office, Washington, D. C., has recently resigned and formed a connection with Messrs. Hoyt & Sears, Mining Attorneys, Merchants' Exchange building in this city. The specific knowledge of the technicalities of the mining laws of Congress and rulings thereunder possessed by Mr. McKee, will render his services especially valuable to parties desiring mining patents or wishing to present adverse claims. The card of the firm of Hoyt, Sears & McKee will be found in another column.

THE MINING WAR AT POCHE.—On the 27th ult. the Picoche Phoenix Mining Co. took possession of about 100 feet of ground, lately worked by the Raymond & Ely company and claimed by both companies. A barricade was raised by the Phoenix on the disputed ground and other preparations made to hold it. One of the Phoenix men was killed while the parties were exchanging shots. Since then the hostility has ceased and no farther violence is anticipated. The Raymond & Ely people agreed not to work west on levels Nos. 4 and 5 and the Phoenix people agreed not to work east from winze, while the latter retain possession of all the ground they hold.

The American Bottle Filler.

Among the articles brought into requisition on this coast by the necessities of our large and increasing wine interest, are bottle fillers, designed to do away with the slow and tedious process of filling bottles by hand, where large numbers have to be filled. The latest improvement in this useful machine is that of Messrs. Armstrong & Marks, which was patented through this agency, and a sketch of which is shown in the accompanying cut. The inventors of this machine claim that one man can do as much work with it as three can without it. In fact, it is only a question of how fast a man or boy can handle the bottles, as it will fill bottles faster than the full ones can be removed and empty ones replaced.

A, represents the tank or reservoir in which the liquid to be bottled is contained. One or more siphons, *D, D*, are secured at their middles to the edges or sides of the tank by means of urns or trunnions, so that one leg will pass down inside of the tank while the other hangs outside. A cap, *E*, fits over the inside end of the siphon, (Fig. 2,) to the upper end of which a spiral spring, *d*, is secured. This spring coils around the tube upward, and is secured to it at some point between the cap and bend of the siphon. The cap, *E*, has an opening at one side, as shown, a short distance above the end of the tube through which the liquid passes when the cap is in position. It will be seen that the spring will draw the cap upwards so that its closed end will be against the open end of the tube; but when the cap is forced downward the opening on the side of the cap, *c*, and the liquid enters the siphon.

In order to operate this cap, a rod, which has its lower end secured to the cap, extends upwards to a sufficient distance to strike the underside of a bar which passes across the tank, *A*, just back of the siphons. Now when the leg of the siphon, *D*, which is outside of the box, *A*, is forced toward the box, the leg inside of the box is raised so as to cause the rod to open the inner end of the siphon; and when it is again freed, the force of the spring will again throw the siphon to its former position and close the inner end.

In order to cause the siphon to retain its charge when not in use, the outside extremity of the outer leg is closed and an opening made in the side of the pipe just above the closed end. This opening is not as large as the hole through the siphon tube. This the inventors have discovered will cause the siphon to hold its charge until the inner end is opened and the liquid allowed to flow through it, thus rendering the siphon automatic and perfectly under control. Secured horizontally to the tank, *A*, is an outward projecting flange, *B*, in which a recess is made opposite each siphon. A latch, *C*, is hinged to this flange and a spring draws it arms the opening in the manner shown. To fill the bottles the outer leg of the siphon is introduced into them until the head around the upper end of the bottle rises above the flange, *B*. The bottle and outer leg of the siphon are forced towards the tank until the neck of the bottle enters the recess in the flange, *B*; the latch *C* then embraces the outside of the neck below the head and holds it in position.

This same movement lowers the cap in the opposite or inside leg of the siphon and allows the liquid to run through until the bottle is filled. By keeping the liquid in the tank at the proper level the bottles will not overflow and the work of filling can be accomplished without waste. The bottles being held by the neck in a similar position would be all filled. The removal of the bottle from the latch causes the valve at the rear end of the siphon to close and stops the flow; while the removal of the bottle from the siphon causes displacement enough to admit of corking without bursting the bottles. The siphons when once charged will retain the liquid an indefinite length of time.

To use the machine the apparatus is placed in front of the hogshead containing the liquid, so that the faucet will project over the top of the tank *A*, or it can be connected by hose if more convenient. When the tank is filled to a level with the latches *c*, and by the usual manner fill the siphons and release them from the latch. The attendant then places himself in front of the apparatus, with the empty bottles at his left hand and space for full ones on his right. A bottle is placed on the end of the first siphon and it is pressed into the latch, the others in proper order. By the time the last bottle is in the first is full; this is removed with one hand and a new bottle placed in its stead, and so on. By this means a large number of bottles can be filled in a short time with little labor. The inventors claim that any one can, after a little practice, fill 75 dozen bottles per hour with this machine. Parties desiring further information can address James Armstrong, No. 240, 6th street, or Samuel Marks, corner Folsom and Fourteenth streets, in this city.

DOMESTIC ECONOMY

Table Customs.

EDITOR OHIO FARMER:—It is a sad fact that there are many families in the country in which exists a feeling of inferiority when thrown into the company of city or refined people. This feeling is not lessened when they are playing the part of hosts, and the awkwardness felt is in exact keeping with the home customs. Well-to-do families are not unfrequently found in the rural districts wherein there is a great want of system, order and politeness, and especially is this found at the table.

A lady from the city, or any well-regulated household, does not feel comfortable when seated at the table of a friend or simple acquaintance, as the case may be, and requested to "help herself or be at home," and she had a thousand times rather "be at home" than to reach over the table for this and that in place of being helped. It does not increase her appetite at all to have the madam cut bread from the loaf as it is wanted with the knife she is eating with, nor to see each member of the family cut from the butter with their individual knives, first drawing them through their mouths to make them clean (?) or to have the pie cut with an eating-knife and passed around, each taking a piece upon a greasy plate, and perhaps one-half filled with meat, potato, cabbage, etc.

I might enumerate any number of such delicacies, far too often practiced, but will not take up space to do so, but wish to simply add a suggestion as to the remedy. A family, to appear well to others, must be so systematized in its regulations that there is harmony at all times in action, if not in words. Cultivation is not necessarily dependent upon capital, for those the most humble in circumstances can have admirable harmony in their home affairs. Seventy-five cents will supply a table with a very neat silver-plated butter-knife, and every pantry is supplied with sufficient cutlery to afford an extra knife for the bread, meat, pie, and with sufficient table-ware to afford each a clean plate for pie, a cup for boiled egg, etc. The bread can be as well cut in the pantry and brought to the table properly sliced, as to be messed out as required; the pie can as well be served on small, clean plates from the pantry as in the manner above mentioned.

Now, some may say that this method is more trouble than profit, and not necessary to practice when only the family is together. I do not propose to argue the question at all, but will add, if not practiced when the family only is together, it never will be. The members of one's family should be the dearest objects of earth; the sons and daughters should be taught those rules in social life which will enable them to stand above ridicule and command respect, and every one is at liberty to adopt them, for they are free. I said, however, that I would not argue the question, and I won't.—*Ohio Farmer.*

INDIAN FRITTERS.—Take three tablespoonfuls of flour, boiling-water, the yolks of four eggs, the whites of two, hot lard or clarified dripping, and jam. Put the water into a basin, and pour over it sufficient boiling-water to make it into a stiff paste, taking care to stir and beat it well, to prevent it getting lumpy. Leave it a little time to cool, and then break it into it (without beating them at first) the yolks of four eggs and the whites of two, and stir and beat all well together. Have ready some boiling lard or butter; drop a dessertspoonful of batter in at a time, and fry the fritters of a light brown. They should rise so much as to be almost like balls. Serve on a dish, with a spoonful of preserves or marmalade dropped in between each fritter. This is an excellent dish for a hasty addition to dinner, if a guest unexpectedly arrives, it being so quickly made, and it is always a great favorite. It takes from five to eight minutes to fry the fritters.—*Mrs. Beeton's Everyday Cookery.*

APPLE TAPIOCA PUDDING.—One coffee-cup of tapioca, covered with three pints of cold water, and soaked over night. In the morning set it on the side of the range, or stove, stirring it often, till it becomes transparent. If too thick, add more water, till it is as thin as good, clear starch. Stir in a small teaspoon of salt. Pare and core, without breaking, as many good apples as will set close on the bottom of a medium-sized pudding-dish. Fill the holes full of sugar, and a very little nutmeg and cinnamon; then pour over the tapioca, and bake slowly till the apples are soft and well done. To be eaten with hard sauce, which is made as follows: One cup sugar, two-thirds of a cup of butter, beaten together until perfectly smooth and white.—*Western Rural.*

APPLE SOUFFLE.—Always stew the apples nicely, then adding a little grated lemon peel and juice, and omitting butter; line the sides and bottom of a baking-dish with them. Make a boiled custard with one pint of milk and two eggs, flavoring with lemon and sweetening it to taste. Let it cool, and then pour into the center of the dish. Beat the white of two eggs to a stiff froth (they can be left out of the custard), spread them over the top; sprinkle white sugar over them, and brown in the oven. The stewed apples should be about half an inch thick on the bottom and sides of the pudding-dish.

CARRIAGE CUSTARD.—Procure an ounce of carrigan moss, and divide it into four parts; one part is sufficient for one mess. Put the moss into water, and let it remain until it swells; then drain it, and put it into two pints end a half of milk, and place it over the fire; let it boil twenty minutes, stirring it continually; then strain it, sweeten it with loaf-sugar; put into cups, and grate nutmeg over the top of them.

Coal and Quicksilver.

The two leading wants of the State are fuel and quicksilver. Both are essential to the mining and reduction of our gold and silver ores, and the prices of both are steadily increasing. The consumption of wood and timber in carrying on mining operations in Storey county alone is enormous. Within a circuit of five miles, including Virginia and Gold Hill, not less than 600 cords of wood are consumed daily. This consumption is at the rate of 18,000 cords per month, or 216,000 cords yearly. All of ninety per cent. of this wood is used in the mills and hoisting-works connected with the mines. In addition to this, the timber consumption in the mines is a heavy daily draft upon our vanishing wood-ranges, and our future timber and wood supplies are matters of increasing anxiety. The accessible mountains, for many miles west of us, have been stripped of their timber, and the bulk of our supplies is brought a distance of from thirty to fifty miles. The wood is flumed down the mountain-sides, where water for the purpose is obtainable, and floated down the Carson River and its tributaries. Thence to this city and Gold Hill it is brought by rail.

For the supply of this market, wood-lands have been located between sixty and seventy miles distant, and the question of fuel is becoming one of grave importance. The hope is that our timber-lands may be relieved of the enormous drain upon them by the discovery of coal somewhere within the State. Small deposits of an inferior quality have been found near Reno, Elko, and within fifteen or twenty miles south and east of this city, but nothing of real value has yet been discovered. Coal indications, of more or less promise, have been found in many localities throughout the State, and in view of the importance of the fuel question, the possibility of the existence of coal here is enough to warrant substantial encouragement in searching for it. Only second to this in importance is the question of quicksilver. The leading cinnabar mines of the world are either owned by or under the control of a gigantic combination of capitalists, and a continued increase in the price of quicksilver may be expected. This combination embraces the control of the New Almaden and New Idria mines of California, from which our supplies of mercury are drawn. The former is one of the richest and most extensive cinnabar deposits in the world, and could easily be made to yield double the quantity of quicksilver now produced by it; but the product is limited by the combination, in order that the price may be maintained, and nothing in the way of relief need be looked for in that quarter.

The consumption of quicksilver in the State amounts to many thousands of pounds daily, and the discovery of a productive cinnabar mine in Nevada would be of immeasurable value to our mining interests. As we said before, coal and quicksilver are our great wants, and as it is possible that both may be found in the State, the next Legislature might with great propriety and general approval offer a reward for the discovery of both. To this end let some of our newly-elected legislators give the matter the attention it deserves, and prepare a bill with provisions something as follows: With the view of encouraging the search for coal and quicksilver, the State will agree to pay a premium of ten thousand dollars for the first 100 flasks of quicksilver produced from a cinnabar mine within the State, and ten thousand dollars for the first 100 tons of coal mined in the State, of a quality not inferior to the Rocky Mountain or Mount Diablo coal. Should the offer result in the discovery either of coal or quicksilver, the money would be well bestowed. The mining industry of the State is the corner-stone, yes, the arch and pillar of our prosperity, and the least the commonwealth can do to assist in providing means to work our precious metal mines after they have been discovered and opened by private enterprise.—*Virginia Enterprise.*

FROZEN UP.—Says the Nevada Transcript: Charles Marsh, Secretary of the South Yuba Canal Company, informs us that all the water in the upper part of the county is frozen up, and the ditches are blocked completely. Thus far this season four inches of water has fallen, the aggregate being an inch less than at this time last season. Little mining can be done in the gravel mines in the county until after from ten to twelve inches of water has fallen at this place. When such a quantity falls the ditches are full, and nearly all the leading mines can be supplied. Very extensive preparations for hydraulic mining have been made in the county this year, and a good season with abundance of water, will make this branch of mining exceedingly lively.

Very extensive preparations for hydraulic mining have been made in Nevada county this year.

Delays of Law—Courts of Conciliation.

No one has satisfactorily answered the question, why is the business of our Courts always behind hand? This subject occupied the attention of the French Government, years ago, and a remedy was devised, which has worked admirably in all lawsuits that occur in the ordinary dealings of industry and commerce.

Courts of conciliation were appointed for every district of town and county. The Judges are selected from retired men of business generally, who know the usual disputes between neighbors, and who have an instinct that quickly discerns which is the crooked stick. We have by invitation, attended the hearing and deciding, in a case in Paris. The written agreement, as is usual, had been drawn by the magistrate two months before. In a moment he perceived who was wrong, and in ten minutes the case was settled. He invited the plaintiff to retire, and then addressed the defendant: "My friend, you have got the wrong impression, will you take my advice?" "Yes, sir." "Then let me settle the matter for you." The defendant retired and plaintiff re-entered. "It was a Madame. Madame," said the Judge, "you are both good people—too good and too wise to affect yourselves, and break friendship over such a matter. I am sure you would willingly yield a little on both sides rather than nurse ill-feeling." "Oh, yes, Monsieur, if he would also be reasonable. I leave it all to you, Monsieur." In a moment they shook hands; apologized for words said in anger; all was settled and two adversaries were made friends. Moreover they entered into an extended contract, in proof of reconciliation. No lawyer appears, no costs are paid, and not one case in fifty is ever appealed. And of such appeals, not one case in a hundred is ever reversed. Surely the system is eminently practical for California. Let benevolent minds be interested in advocating this most desirable reform.

There are just such men in California, who are competent in capacity and inclination for judges of courts of conciliation, and to whom such daily occupation from two to three o'clock would be a merciful dispensation, to say nothing of the alluring title it would confer. They must have no politics. How much ill-feeling, how much permanent malice now engendered would be averted, if all mechanics and tradesmen would make bargains before such a judge and mutually agree to be bound by his final decision!

This is worthy of the notice of all associations. It ought to be the leading object of every united confraternity to confer upon its members and their families, the unquestioned benefits of this system, as well for its economy as for its morality.—*Alla.*

Shell Mounds on the California Coast

San Pablo is about fifteen miles from Oakland, and lies almost due north, and the road follows the beach. When within three miles of the town we came to a shell mound, says a correspondent of the *St. Louis Globe*, rising up from the plain to almost the dignity of a hill, and which is now covered with a growth of shrubbery. There is no telling when or by whom that mound was raised, but it is almost a mile long and half a mile wide.

Fragments of pottery made of red earth, not to be obtained anywhere in this State, are found on the surface and near the top; and about two years ago Mr. McHenry, the owner of the land, dug a trench, and at a depth of twenty feet, sixty feet in from the west, near the base, found numerous skeletons of Indians of all sizes, and some bones of dogs and birds, and many implements of stone. One baby had been rolled in a monstrously long piece of red silk, like the mummies, and had been covered with a coating of a sort of asphaltum. Mr. McHenry also found in other parts of the hill evidences enough to show that this mound was a burying place for some extinct tribe of Indians, as the skulls are different from all others known in some particulars.

Where the red silk came from would puzzle any one to know, as this must have been a primitive race, judging by the rude implements and utensils. All the skeletons were in a sitting posture, with their faces turned northward. The shells that form this mound are oyster, clam and mussel shells, all having been exposed to the action of fire, and nearly all broken fine. Very rarely are entire shells found. The same kind of mounds, though not so large, are found near San Mateo, on the San Francisco side. They are all near the shores of the bay, and have been made of shells of the oysters and mussels that the Indians used as food, and which they evidently roasted to open.

CO-OPERATION IN GREAT BRITAIN.—Co-operative societies are much more numerous in Great Britain than most people would suppose. We see it stated that one wholesale co-operative society in the north of England supplies 99 other societies with goods, "and has no less than 235 societies in federation," and that its sales for the year ending April 1 amounted to over \$3,793,820. Another society in Scotland had 97 retail stores "in federation"—or as branches, we suppose—selling annually \$1,000,000 worth of goods. A retail society at Oldham has 8,000 members, a capital of \$2,550,800; and its receipts for last year were \$1,550,000. In all, there is about 4,508 societies, with over 400,000 members, and many societies number from 1,000 to 4,000 members.

What is Slate, and How was it Formed?

That slate may have been once mud is more probable by the simple fact that it can be turned into mud again. If you grind up slate, add then analyze it, you will find its mineral constituents to be exactly those of a very fine, rich, and tenacious clay. Wherever the top of the slate beds and the soil upon it is laid bare, the black layers of slate may be seen gradually melting, if I may use this word (says the Rev. Charles Kingsley in "Town Geology"), under the influences of rain and frost, into a rich tenacious clay, which is now not black like its parent slate, but red, from the oxidation of the iron which it contains. But, granting this, how did this first change take place? It must be allowed at starting that time enough has elapsed, and events have happened, since our supposed mud began first to become slate, to allow of many and strange transformations. For these slates are found in the oldest beds of rocks, save one series, in the known world; and it is notorious that the older and lower the beds in which the slates are found, the better—that is, the more perfectly elaborate—is the slate. The best slates of Snowdon (I must confine myself to the districts which I know personally) are found in the so-called "Cambrian" beds. Below these beds but one series of beds is as yet known in the world, called the "Laurentian." They occur to a thickness of some 80,000 feet, in Labrador, Canada, and the Adirondack mountains of New York; but their representatives in Europe are, as far as known, only to be found in the northwest highlands of Scotland and in the island of Lewis, which consists entirely of them. And it is to be remembered, as a proof of their inconceivable antiquity, that they may have been upheaved and shifted long before the Cambrian rocks were laid down "unconformably" on their worn and broken edges.

THE BESSEMER SALOON STEAMBOAT.—The project of the Saloon for the avoidance of seasickness seems to have taken tangible shape since the demonstration of the fact that the anticipated results will follow from such a mode of construction. Mr. Bessemer has associated himself with Mr. E. J. Reed, a gentleman of means and scientific attainments, to carry out the project, and a company has been formed with a capital of \$1,250,000. Two vessels are to be immediately constructed for the Channel navigation. In addition to the advantage of the comparatively motionless Bessemer saloon and promenade deck, they will embody every improvement for space, comfort and speed that the skill of the designers can introduce.

THE DISCOVERY OF PETROLEUM IN PENNSYLVANIA.—We made reference, a few weeks since, to some "Notes on the History of Petroleum," read before the Academy of Sciences of this city, by Mr. R. E. C. Stearns wherein he traced back the discovery of petroleum, or rather what was supposed to be the first printed mention of it to the *Massachusetts Magazine* for 1789, page 416.

A correspondent of the *American Chemist* now furnishes that journal with an extract from an "old book," published in 1772, in which is found a map entered according to Act of Parliament in 1771, upon which the exact location of the "oil spring" is set down, upon the banks of what is now known as Oil Creek, in the northern part of Pennsylvania.

NEVADA SALT AND SODA BEDS.—The *Carson Register* says that the borate of soda and salt beds of that country are receiving the attention of capitalists, and that preparations are being made to work them on an extensive scale. As soon as the road from Columbus to the Nine Mile House, this side of Aurora, is completed, one Nadau expects to have freight enough from the working of these beds to keep thirty-two ten-mule teams constantly employed in hauling to this place.

VIRGINIA GOLD MINE.—The gold mines of Spottsylvania county, Va., are still worked to advantage. According to the *Fredericksburg Ledger*, the work is vigorously prosecuted at the White Hall mine, and in the Old Dominion four new shafts have been sunk, each one hundred feet in depth. New buildings and other improvements to the value of \$20,000 have also been added, and the work now in progress employs forty hands. The ore lately taken from this mine is said to be very rich.

LAKE SUPERIOR GOLD.—A mining engineer, who has spent some time in exploring upon the north shore of Lake Superior, reports that the gold discoveries on Lake Sheldandown, of which so much was said a year since, turn out to be of little practical importance. There is gold there in quartz rock, in well defined veins, but it cannot be made to yield more than forty dollars per ton, and this is not enough to pay the cost of getting it out.

RAILROAD IRON.—The importations into the United States of iron rails for the eleven months ending with November, were 186,084 tons, against 200,123 tons in 1871, or enough probably for 2,115 miles of track this year, and for 2,275 miles last year. The imports in November were very light—11,411 tons—but of this more than one-half was steel. The American production is much greater this year than last.

THE LEAVENWORTH, LAWRENCE & GALVESTON, AND KANSAS CITY AND SANTA FE RAILROAD COMPANIES are building large machine shops at Ottawa, Kansas, at a cost of \$400,000.

Business Cards.

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This Amalgamator Operates as follows:
The pan being filled, the motion of the muller forces
the pulp to the center, where it is drawn down through
the aperture and between the grinding surfaces.—
Thence it is thrown to the periphery into the quicksilver.
The curved plates again draw it to the center, where it
passes down, and to the circumference as before. Thus
it is constantly passing a regular flow between the grind-
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They bring the pulp so constantly and perfectly in con-
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Mining Laws Under the New Code.

Mining Corporations.

584. Every mining corporation may change its principal place of business from one county or city to another, within this State. Before such removal is made the consent in writing of the holders of two-thirds of the capital stock must be obtained and filed in the office of the corporation. When such consent is obtained, notice of the intended removal must be published for thirty days in some newspaper published at the principal place of business of the corporation, giving the name of the county or city where it is then situated, and that to which it is intended to remove it.

585. When the publication provided for in the preceding section has been completed, the Directors of the corporation must file in the offices of the Clerks of the counties from and to which such change has been made, and in the office of the Secretary of State, certified copies of the written consent of the stockholders to such change, and of the notice of such change, and proof of publication; also, a certificate that the proposed removal has taken place; and thereafter the principal place of business of the corporation is at the place to which it is removed.

586. Any corporation organized in this State for the purpose of mining or carrying on mining operations in or without this State, may establish and maintain agencies in other States of the United States, for the transfer and issuing of their stock; and a transfer or issue of the same at any such transfer agency, in accordance with the provisions of its by-laws, is valid and binding as fully and effectually for all purposes as if made upon the books of such corporation at its principal office within this State. The agencies must be governed by the by-laws and Directors of the corporation.

NOTE.—Stats. 1863-4, p. 429, Secs. 1, 2.

587. All stock of any such corporation, issued at a transfer agency, must be signed by the President and Secretary of the corporation, and countersigned at the time of its issue by the agent having charge of the transfer agency. No stock must be issued at a transfer agency unless the certificate of stock, in lieu of which the same is issued, is at the same time surrendered for cancellation.

NOTE.—Stats. 1871-2, p. 413.

An Act for the Protection of Miners.

[Approved March 16, 1872.]

[Enacting Clause.]

SECTION 1. It shall not be lawful for any corporation, association, owner or owners of any quartz mining claims within the State of California, where such corporation, association, owner or owners employ twelve men daily, to sink down into such mine or mines any perpendicular shaft or incline beyond a depth from the surface of three hundred feet without providing a second mode of egress from such mine, by shaft or tunnel, to connect with the main shaft at a depth of not less than one hundred feet from the surface.

SEC. 2. It shall be the duty of each corporation, association, owner or owners of any quartz mine or mines in this State, where it becomes necessary to work such mines beyond the depth of three hundred feet, and where the number of men employed therein daily shall be twelve or more, to proceed to sink another shaft or construct a tunnel so as to connect with the main working shaft of such mine as a mode of escape from underground accident or otherwise. And all corporations, associations, owner or owners of mines as aforesaid, working at a greater depth than three hundred feet, not having any other mode of egress than from the main shaft, shall proceed as herein provided.

SEC. 3. When any corporation, association, owner or owners of any quartz mine in this State shall fail to provide for the proper egress as herein contemplated, and where any accident shall occur, or any miner working therein shall be hurt or injured, and from such injury might have escaped if the second mode of egress had existed, such corporation, association, owner or owners of the mine where the injuries shall have occurred, shall be liable to the person injured in all damages that may accrue by reason thereof; and an action at law in a court of competent jurisdiction may be maintained against the owner or owners of such mine, which owners shall be jointly or severally liable for such damages. And where death shall ensue from injuries received from any negligence on the part of the owners thereof by reason of their failure to comply with any of the provisions of this Act, the heirs or relatives surviving the deceased may commence an action for the recovery of such damages as provided by an Act entitled an Act requiring compensation for causing death by wrongful act, neglect or default, approved April twenty-sixth, eighteen hundred and sixty-two.

SEC. 4. This Act shall take effect and be in force six months from and after its passage.

NOTE.—Stats. 1871-2, p. 443.

An Act supplemental to an Act entitled an Act concerning Corporations, passed 22d April, 1852.

[Enacting Clause.]

[Approved March 21, 1872.]

SECTION. 1. On petition of the majority of the shareholders of any corporation formed for the purpose of mining to the County Judge of the county where said corporation has its principal place of business, verified by the signers, to the effect that they are severally the holders on the books of the company of the number of shares set opposite their signatures to the foregoing petition, the County Judge shall issue his notice to the shareholders of said company that a meeting of the shareholders will be held, stating the time, not less than five nor more than ten days after the first publication of such notice, and the place of meeting within such county, and the object to be taken into consideration the removal of officers of said company; which notice, signed by the said County Judge, shall be published daily in one or more daily newspapers published in said county for at least five days before the time for the meeting.

SEC. 2. At this time and place appointed by said notice those claiming to be shareholders who shall assemble shall proceed to organize by the appointment of a Chairman and Secretary, and thereupon those claiming to be shareholders shall present proof thereof, and only those showing a right to vote shall take part in the further proceedings. If it appears that at the time appointed, or within one hour thereafter, shareholders of less than one half the shares are present, no further proceedings shall be had, but the meeting shall be *ipso facto* dissolved; provided, however, that by a vote of the holders of two-thirds of the capital stock of the corporation aforesaid, the Board of Trustees may be required to furnish to the meeting a written detailed statement and account of the affairs, business and property of the corporation, but if the holders of more than two-thirds of the shares are present they shall proceed to vote, the Secretary calling the roll and the members voting yea or no, as the case may be. The Secretary shall enter the same upon his list, and when he has added up the list and stated the result he shall sign the same and hand it to the Chairman, who shall also sign the same and declare the result.

SEC. 3. If the result is that the holders of a majority of all the shares of the company are in favor of the removal of one or more of the officers of the company, the meeting shall then proceed to ballot for officers to supply the vacancies thus created. Tellers shall be appointed by the Chairman, who shall collect the ballots and deliver them to the Secretary, who shall count the same in open session, and having stated the result of the count in writing, shall sign the same and hand it to the Chairman, who shall announce the result to the meeting.

SEC. 4. A report of the proceedings of the meeting shall be made in writing, signed by the Chairman and Secretary and verified by them, and delivered to the County Judge, who shall thereupon issue to each person chosen a certificate of his election, and shall also issue an order requiring that all books, papers, and all property and effects be immediately delivered to the officers elect, and the petition and report, endorsed with the date and fact of the issuance of such certificate and order, shall be delivered to the County Clerk to be by him filed in his office, and thereafter the persons thus elected officers shall be the duly elected officers and hold office until the next regular annual meeting, unless removed under the provisions hereof.

SEC. 5. For all services in these proceedings the County Clerk shall receive ten dollars on the issuance of the notice and ten dollars on the issuance of the certificate.

SEC. 6. All Acts or parts of Acts conflicting with this Act are hereby repealed.

SEC. 7. This Act shall take effect immediately.

San Francisco Metal Market.

PRICES FOR INVOICES.

Shipping prices rule from ten to fifteen per cent. higher than the following quotations.

TUESDAY, Dec. 31, 1872.

IRON.—		
Scotch Pig Iron, 30 ton.....	\$3 00	@ 55 00
White Pig, 30 ton.....	3 00	@ 55 00
Refined Bar, bad assortment, 30 D.....	—	@ — 06
Refined Bar, good assortment, 30 D.....	—	@ — 06 1/2
Plate, No. 10 to 12.....	—	@ — 06
Plate, No. 10 to 12.....	—	@ — 06 1/2
Sheet, No. 10 to 12.....	—	@ — 06 1/2
Sheet, No. 14 to 20.....	—	@ — 06 1/2
Sheet, No. 24 to 30.....	—	@ — 06 1/2
Horse Shoes.....	9 00	@ —
Nail Rod.....	10 00	@ —
Norway Iron.....	—	@ —
Roller Iron.....	—	@ —
Other Irons for Blacksmiths, Miners, etc.	5 1/2 @	6 1/2
COPPER.—		
Sheathing, 30 D.....	—	@ — 45
Sheathing, Yellow, 30 D.....	—	@ — 40
Sheathing, Old Yellow.....	—	@ — 13
Composition Nails.....	—	@ — 28
Composition Bolts.....	—	@ — 28
TIN PLATES.—		
Plates, Charcoal, 10 D box.....	18 00	@ —
Plates, 10 Charcoal.....	14 00	@ —
Polishing Plates.....	18 50	@ —
Banca Tin, Slabs, 30 D.....	—	@ — 50
STEEL.—English Cast, 30 D.....	—	@ — 20
Drill.....	—	@ — 20
Plough Points.....	16	@ — 17
Russia (for mould boards).....	12 1/2	@ — 15

Leather Market Report.

[Reported for the Press by Dolliver & Co.]

SAFETY, Tuesday, Dec. 31, 1872. Shipments of Sole Leather to the East are quite heavy, and prices are firm, though there has been no advance. Domestic Calf Skin has advanced 10 per cent., in consequence of the large amount destroyed, and French Skins are firm with an upward tendency.

City Tanned Leather, 30 D.....	25 00 @	25 00
Santa Cruz Leather, 30 D.....	25 00 @	25 00
Country Leather, 30 D.....	25 00 @	25 00
Stockton Leather, 30 D.....	25 00 @	25 00
Leather, 30 D, per doz.....	50 00 @	50 00
Jodot, 11 to 15 Kil., per doz.....	65 00 @	85 00
Jodot, second choice, 11 to 15 Kil., per doz.....	55 00 @	70 00
Lemons, 16 to 18 Kil., per doz.....	75 00 @	77 50
Levin, 12 and 13 Kil., per doz.....	68 00 @	70 00
Cornellian, 16 to 19 Kil., per doz.....	63 00 @	65 00
Cornellian, 12 to 14 Kil., per doz.....	58 00 @	60 00
Cornellian Females, 14 to 16 Kil., per doz.....	65 00 @	70 00
Oregon Calf, 30 D.....	54 00 @	54 00
Simon, 18 Kil., per doz.....	60 00 @	60 00
Simon, 20 Kil., per doz.....	65 00 @	65 00
Simon, 24 Kil., per doz.....	72 00 @	72 00
Robert Calf, 7 and 8 Kil., per doz.....	35 00 @	40 00
French Kips, 30 D.....	1 00 @	1 30
California Kip, 30 D.....	55 00 @	70 00
French Sheep, all colors, 30 D.....	8 00 @	15 00
Eastern Calf for Backs, 30 D.....	4 00 @	22
Sheep Roans for Topping, all colors, 30 D.....	3 00 @	13 00
Sheep Roans for Linings, 30 D.....	3 50 @	10 50
California Russell Sheep Linings, 30 D.....	1 75 @	5 50
Best Jodot Calf Boot Legs, per pair.....	5 25	@ —
Good French Calf Boot Legs, per pair.....	4 50 @	6 00
French Calf Boot Legs, per pair.....	4 00 @	5 00
Harness Leather, 30 D.....	48 00 @	57 1/2
Fair Bridle Leather, 30 D.....	48 00 @	57 1/2
Skirting Leather, 30 D.....	34 00 @	37 1/2
Wax Leather, 30 D.....	30 00 @	50 00
Buff Leather, 30 D.....	1 50 @	23
Wax Side Leather, 30 D.....	20 00 @	22
Eastern Wax Leather.....	26	@ —

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PACIFIC MINERAL LAND OFFICE.—HOYT, SEARS & McKEE—MERCHANTS' EXCHANGE, CALIFORNIA STREET, SAN FRANCISCO, CAL.—Mining Patents obtained for claims in California, Nevada, Utah, Arizona, and elsewhere. Plans and papers prepared for adverse claimants, as required by the new law; relocations effected where claims have lapsed under the Congressional Act of May 10, 1872; Mining Contests conducted before the Departments and Courts.

Mr. McKee's experience as Chief of the Mining Claims Division, General Land Office, Washington, D. C., will be valuable to parties desiring to properly appear either as claimants for patents or as adverse claimants. Cases attended to in person at any of the District Land Offices, or at the Departments at Washington, where deemed necessary. JAS. T. HOYT, W. H. SEARS, O. H. MCKEE. 1726-3m.

WONDERFUL CURE.—A young man, a resident of this city, gives us the facts of the following remarkable cure. He says: "I suffered with Catarrh in its worst form. Bones came from my nose; my breath became offensive; I was compelled to eat alone. I had given up all hopes of being cured. At this time met Dr. Evory, of Chicago, who had been cured by a remedy discovered by himself. I tried the remedy, with little faith; but at the end of three months I was completely cured." Our informant has now associated himself with the discoverer in the manufacture of the article, which will be known under the name of the Diamond Catarrh Remedy. Price 50 cts.; sent by mail for 60 cts. A. F. EVORY & CO., No. 9 Post street, San Francisco. Sold by all druggists. 2625-3m.

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DIVIDEND NOTICE.

SAN FRANCISCO SAVINGS UNION,

632 California street, corner of Webb, SAN FRANCISCO.

For the half year ending with December 31, 1872, a dividend has been declared at the rate of nine and six-tenths (9-10) per cent. per annum on Term Deposits, and eight (8) per cent. per annum on Ordinary Deposits, free of Federal Tax on deposits, payable on and after January 13, 1873. By order.

Jan-1m

LOVELL WHITE, Cashier.

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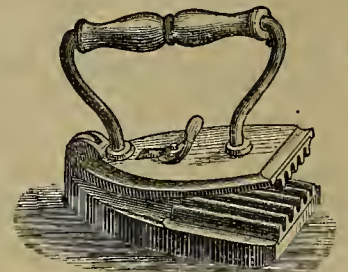
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This new invention takes the place of two articles needed in nearly every house. As a POLISHING IRON it has no superior. The part used for fluting is made of brass, and highly polished. The Polishing Iron and Fluter, being in one, are both heated at the same time. We are now prepared to furnish them in quantities to suit.

WIESTER & CO.,

17 New Montgomery street, San Francisco, General Agents for Pacific Coast.

PROPOSALS

For Material and Work

FOR A PORTION OF THE

New City Hall Building.

OFFICE OF BOARD OF CITY HALL COMMISSIONERS, SAN FRANCISCO, November 25, 1872.

SEALED PROPOSALS FOR FURNISHING certain material for a portion of the New City Hall Building and Hall of Records and for the construction thereof, will be received at the office of the Board of City Hall Commissioners, corner of McAllister and Leavenworth streets, until 12 o'clock M. of FRIDAY, the 27th day of December, A. D. 1872, except for Iron Works, and for that, until 12 o'clock M. of FRIDAY, the 24th day of January, A. D. 1873, viz:

10,000,000 Brick;
5,000 Barrels Lime;
5,000 Barrels Cement;
Stone for Facing of Basement Story and Building the same in the Walls, etc;
Rolled Iron Joists;
Iron Girders and Columns;
Building Brick in the Walls, etc., including Bonding, Anchors, etc.

Building Brick Facing of Basement Story;
Fixing, Fitting and Laying Iron Joists and Girders. All according to the Printed Specifications, Schedule, etc., and Plans and Drawings.

The Printed Specifications and Printed Forms of Proposals can be had on application to the Secretary, and the Plans and Drawings can be seen, and all further information—as to the details of the work, etc.—can be obtained from the Architect, at the office of the Board.

The Bids must be endorsed for the Material proposed to be furnished or Work done, and addressed to the Secretary of the Board.

No Bids will be entertained unless made on the specified "Printed Forms of Proposal," and accompanied by a certified check, or bond with two good and sufficient sureties, in a sum equal to 10 per cent. of the total sum of the tender, to be returned on the due entering into the contract of the party to whom it may be awarded, or to be forfeited, if the party fail to enter into the said contract.

Each bidder for Brick will state what quantity he will furnish within one year, and at what times he will deliver the same. Samples must accompany each bid.

The Board reserve the right to reject any and all bids. Payments will be made monthly in "City Hall Warrants," of 76 per cent. of estimated amounts due, and the remaining 26 per cent. when the contract is completed.

P. H. CANAVAN,

JOS. G. EASTLAND,
CHAS. E. MCLANE,
Board of City Hall Commissioners. no30-1m

NOTICE OF POSTPONEMENT.

The time for receiving bids advertised to be received December 27th, is hereby extended to JANUARY 10th, except for Cement, which is extended to JANUARY 24, 1873.

P. H. CANAVAN,
JOS. G. EASTLAND,
CHAS. E. MCLANE,
Board of City Hall Commissioners. de23-2t

CONTINENTAL LIFE INSURANCE Co., No. 302 Montgomery street, corner of Pine,

Mining and Other Companies.

During the time necessary to mail the present large edition of the M. & S. Press we are obliged to go to press on Thursday evening—which is the very latest hour we can receive our communications.

Amazon Silver Mining Company—Location of works, Ely District, Lincoln County, Nevada.
Notice is hereby given, that at a meeting of the Board of Trustees of said Company, held on the Twenty-second day of October, 1872, an assessment of Ten Cents per share was levied upon the capital stock of said Company, payable immediately in United States gold and silver coin, to the Secretary of said Company, at his office, No. 609 Sacramento street, San Francisco, Cal. Any stock upon which said assessment has not been paid, and which shall remain unpaid on the 15th day of January, 1873, shall be deemed delinquent, and will be duly advertised for sale at public auction, and unless payment shall be made before, will be sold on Friday, January 18th, 1873, to pay the delinquent assessment, together with costs of advertising and expenses of sale. By order of the Board of Trustees.
M. MCANUS, Secretary pro tem.
Office, 609 Sacramento street, San Francisco, Cal. de1-tt

Bunker Hill Quartz Mining Company— Location of works, Amador, Amador County, Cal.
Notice is hereby given, that at a meeting of the Board of Trustees of said Company, held on the 24th day of December, 1872, an assessment of Ten Dollars per share was levied upon the capital stock of said Company, payable immediately to the Secretary, in United States gold coin, at his office, No. 19 First street, San Francisco, California. Any stock upon which said assessment shall remain unpaid on Monday, the 6th day of January, 1873, shall be deemed delinquent, and will be duly advertised for sale at public auction, and unless payment shall be made before, will be sold on Monday, January 27th, 1873, to pay the delinquent assessment, together with the cost of advertising and expenses of sale.
CHARLES H. KNOX, Secretary pro tem.
Office, 19 First street, San Francisco, California.

Cordillera Gold and Silver Mining Company— Location of property, Morelos Mining District, Chihuahua, Mexico.
At a meeting of the Board of Trustees held at the office of the Company, December 21st, 1872, a special assessment of fifteen cents (15 cts.), was levied on each and every share of the capital stock of the Company, payable immediately to the Secretary of the Company, No. 321 Washington street, San Francisco, Cal.
Any stock upon which said assessment shall remain unpaid on the 15th day of January, 1873, shall be deemed delinquent, and will be duly advertised for sale at public auction, and unless payment shall be made before, will be sold on Monday, the 10th day of February, 1873, to pay the delinquent assessment, together with the costs of advertising and expenses of sale.
HENRY R. REED, Secretary.
Office, 321 Washington street, San Francisco, Cal. December 25th, 1872. de1-tt

Golden Rule Mining Company—Location: Poverty or Chilli Hill, Tuolumne County, California.
Notice.—There are delinquent upon the following described stock, on account of assessment (No. 6,) levied on the 2d day of November, 1872, the several amounts set opposite to the names of the respective shareholders, as follows:
Names. No. Certificate. No. Shares. Amount.
J. H. Webster..... 71 50 \$25 00
J. H. Webster..... 72 50 25 00
J. H. Webster..... 73 50 25 00
P. E. Webster..... 37 25 12 50
Mrs H. E. Morse..... 40 3 00
W. E. Cranna..... 39 2 50
A. S. Evans..... 34 1 50
L. P. Davis..... 436 6 3 00
H. C. Walker..... 465 50 25 00
H. C. Walker..... 466 20 10 00
W. F. Kling, Trustee..... 493 10 5 00
J. B. Russell..... 479 10 5 00
Mrs A. J. Eaton..... 492 10 5 00
And in accordance with law, and an order of the Board of Trustees, made on the 2d day of November, A. D., 1872, so many shares of each parcel of said stock as may be necessary, will be sold at public auction, at the auction house of Maurice Dore & Co., No. 327 Montgomery St., on Saturday, the fourth day of January, 1873, at the hour of one o'clock P. M., of said day, to pay the delinquent assessment thereon, together with costs of advertising and expenses of sale.
J. B. RUSSELL, Secretary.
Office—Room 5, over Donahue & Kelly's Bank, 432 Montgomery street, San Francisco, de1-tt

Gold Run Mining Company—Location of works, Nevada County, Cal.
Notice is hereby given, that at a meeting of the Board of Trustees of said Company, held on the 30th day of December, 1872, an assessment of ten (10) cents per share was levied upon the capital stock of said Company, payable immediately in United States gold coin, to the Secretary, at his office, corner of Market and Spear streets, San Francisco. Any stock upon which said assessment shall remain unpaid on Tuesday, February 4th, 1873, shall be deemed delinquent, and will be duly advertised for sale at public auction, and unless payment shall be made before, will be sold on Tuesday, February 26th, 1873, to pay the delinquent assessment, together with costs of advertising and expenses of sale.
C. C. PALMER, Secretary.
Office, corner Market and Spear streets, S. F. de1-tt

A Special Meeting of the Stockholders of the Gold Run Mining Co., for the election of a new Board of Trustees, and for the transaction of such other business as may properly come before the meeting, will be held at the office of the Secretary, corner of Market and Spear streets, on Tuesday, February 4th, at 12 o'clock M. By order of the Board of Trustees.
C. C. PALMER, Secretary. de1-tt

Great Blue Gravel Range Company— Location of works, Blue Gravel Range, Placer County, California.
Notice is hereby given, that at a meeting of the Board of Trustees of said Company, held on the 15th day of November, 1872, an assessment of Ten Cents per share was levied upon the capital stock of said Company, payable immediately in United States gold coin, to the Secretary, at the office of the Company, Room 5 and 6, No. 302 Montgomery street, San Francisco, Cal. Any stock upon which said assessment shall remain unpaid on Wednesday, the 18th day of December, 1872, shall be deemed delinquent, and will be duly advertised for sale at public auction, and unless payment shall be made before, will be sold on Tuesday, the 7th day of January, 1873, to pay the delinquent assessment, together with costs of advertising and expenses of sale.
By order of the Board of Trustees.
WM. H. WATSON, Secretary.
Office, Room 5 and 6, No. 302 Montgomery street, San Francisco, California. de2-tt

Great Blue Gravel Range Company—Postponement—The day for deemed stock delinquent on the above assessment is hereby postponed until Tuesday, the 7th day of January, 1873, and the sale thereof until Tuesday, the 28th day of January, 1873, at same place and hour. By order of the Board of Trustees. WM. H. WATSON, Secretary. de2-tt

The Piedmont Land Company—Location of property, Alameda County, State of California.
Notice is hereby given, that at a meeting of the Directors of said Company, held on the 25th day of December, 1872, an assessment of seven dollars, gold coin, per share was levied upon the capital stock of said Company, payable immediately to the Secretary of said Company, at his office, No. 522 California street, San Francisco, Cal. Any stock upon which said assessment shall remain unpaid on the 27th day of January, 1873, shall be deemed delinquent, and will be duly advertised for sale at public auction, and unless payment shall be made before, will be sold on the 27th day of February, 1873, to pay the delinquent assessment, together with costs of advertising and expenses of sale.
FRANK JAYNE, Secretary.
San Francisco, Cal., Dec. 29, 1872. de1-tt

Hudson Gold Mining Company—Location of works, Cherokee Mining District, Plumas County, State of California.
Notice.—There are delinquent upon the following described stock, on account of assessment (No. 2) levied on the 11th day of November, 1872, the several amounts set opposite the names of the respective shareholders as follows:
Names. No. Certificate. No. Shares. Amount.
Curtis, J. P..... 43 100 \$50 00
Fussell, J. P..... 36 100 50 00
Hansen, George..... 36 100 50 00
Kenney, C. A., Trustee..... 27 275 20 62
McClellan, H. H..... 28 500 37 50
McClellan, H. H..... 32 100 7 50
Mack, Julius..... 39 100 7 50
Olmsted, S. E..... 40 100 90 00
Olmsted, S. E..... 41 100 90 00
Olmsted, S. E..... 42 100 7 50
Olmsted, S. E..... 44 100 7 50
Rowe, Robert..... 35 250 18 75
Smith, F. A..... 10 2000 150 00
Smith, F. A..... 16 475 35 03
Uhlir, J. Clem., Trustee..... 26 200 15 00
Warner, Charles H..... 34 250 15 00
And in accordance with law, and an order of the Board of Trustees, made on the eleventh day of November, A. D., 1872, so many shares of each parcel of said stock as may be necessary, will be sold at the office of the Company, No. 411 California street, San Francisco, California, on Monday, the 6th day of January, A. D., 1873, at the hour of 1 o'clock P. M. of said day, to pay said delinquent assessment thereon, together with costs of advertising and expenses of sale.
JOS. L. KING, Secretary.
Office, 411 California street, San Francisco, California. de21-tt

Hardy Coal Mining Company—Location of works, Coosue County, Oregon.
Notice.—There are delinquent upon the following described stock, on account of assessment levied on the 16th day of November, 1872, the several amounts set opposite the names of the respective shareholders, as follows:
Names. No. Certificate. No. Shares. Amount.
Thomas Hardy..... 7 (New) 75 \$37 50
Thomas Hardy..... 8 (New) 19 9 50
Thomas Hardy..... 18 (New) 155 75 00
Thomas Hardy..... 34 (New) 29 14 50
Thomas Hardy..... 2 (Old) 6 31 25
And in accordance with law, and an order of the Board of Trustees, made on the 16th day of November, 1872, so many shares of each parcel of said stock as may be necessary, will be sold at public auction, at the office of the Company, Room 6, No. 338 Montgomery street, San Francisco, California, on Saturday, the 18th day of January, 1873, at 11 o'clock A. M. of said day, to pay said delinquent assessment thereon, together with costs of advertising and expenses of sale.
JACOB HARDY, Secretary.
Office, Room 6, No. 338 Montgomery street, San Francisco, California. de28-tt

Ivanhoe Silver Mining Company—Location of works: Ely District, Lincoln County, State of Nevada.
Notice is hereby given, that at a meeting of the Board of Trustees of said Company, held on the 12th day of December, 1872, an assessment of one dollar per share was levied upon the capital stock of said Company, payable immediately in United States gold coin, to the Secretary, at his office, 220 Clay street, San Francisco. Any stock upon which said assessment shall remain unpaid on the 15th day of January, 1873, shall be deemed delinquent, and will be duly advertised for sale at public auction, and unless payment shall be made before, will be sold on Thursday, the 9th day of February, 1873, to pay the delinquent assessment, together with costs of advertising and expenses of sale. By order of the Board of Trustees.
DANIEL BUCK, Secretary.
Office, 14 Stevenson Building, No. 331 Montgomery street, San Francisco. de1-tt

Kincaid Flat Mining Company—Location of works: Tuolumne County, State of California.
Notice is hereby given, that at a meeting of the Board of Trustees of said Company, held on the 9th day of December, 1872, an assessment of three dollars per share was levied upon the capital stock of said Company, payable immediately in United States gold coin, to the Secretary, at his office, 220 Clay street, San Francisco. Any stock upon which said assessment shall remain unpaid on the 15th day of January, 1873, shall be deemed delinquent, and will be duly advertised for sale at public auction, and unless payment shall be made before, will be sold on the 15th day of February, 1873, to pay the delinquent assessment, together with costs of advertising and expenses of sale. By order of the Board of Trustees.
R. H. CORNELL, Secretary.
Office, 220 Clay street, San Francisco. de1-tt

Lemon Mill and Mining Company—Notice to Stockholders.
Notice is hereby given, that a meeting of the Stockholders of the Lemon Mill and Mining Company will be held at the office of the Secretary, No. 608 Merchant street, San Francisco, Cal., on Monday, the 6th day of January, 1873, at 12 o'clock P. M. of said day, for the purpose of voting upon the proposed increase of the capital stock of the Company from two million (2,000,000) dollars, divided into twenty thousand (20,000) shares, of the par value of one hundred (100) dollars each (the present stock of the Company), to three Million (3,000,000) Dollars, divided into thirty thousand (30,000) shares, of the par value of one hundred (100) dollars each.
G. W. CLARK, Trustee, Lemon Mill and Mining Co.
H. H. SCHAFER, Trustee, do
JOHN FAY, Trustee, do
CAMILLO MARTIN, Trustee, do
San Francisco, Dec. 3d, 1872. de1-tt

Mammoth Blue Gravel Company—Location of works, Nevada County, California.
Notice.—There are delinquent upon the following described stock, on account of assessment (No. 1) levied on the 18th day of November, 1872, the several amounts set opposite the names of the respective shareholders as follows:
Names. No. Certificate. No. Shares. Amount.
G. W. Fraser (Bal)..... 9 872 \$59 76
H. S. Warren..... 12 1742 139 36
S. B. Whipple (Bal)..... 7 1730 138 45
Jas T. Dean..... 8 2130 170 40
Mrs S. W. Croninger..... 13 169 12 72
John Williams (Bal)..... 3 238 19 05
Peter Cook..... 14 367 30 06
And in accordance with law, and an order of the Board of Trustees, made on the 18th day of November, 1872, so many shares of each parcel of said stock as may be necessary, will be sold at public auction, at the office of the Company, Room 37, New Merchants' Exchange, on the 18th day of January, 1873, at the hour of 12 o'clock P. M. of said day, to pay said delinquent assessment thereon, together with costs of advertising and expenses of sale.
J. M. BUFFINGTON, Secretary.
Office, Room 37, New Merchants' Exchange, California street, San Francisco, California. de28-tt

Mount Jefferson Milling and Mining Company. Location of works: First Garote, Tuolumne County, California.
Notice is hereby given, that at a meeting of the Board of Trustees of said Company, held on the eighteenth day of December, A. D., 1872, an assessment of fifteen cents per share was levied upon the capital stock of said Company, payable immediately in United States gold coin, to the Secretary of said company, at company's office, 418 California street, San Francisco, Cal.
Any stock upon which said assessment shall remain unpaid on Monday, the 27th day of January, A. D., 1873, shall be deemed delinquent, and will be duly advertised for sale at public auction, and unless payment shall be made before, will be sold on Monday, the 15th day of February, 1873, at the hour of 2 o'clock P. M., to pay the delinquent assessment, together with costs of advertising and expenses of sale. By order of the Board of Trustees.
J. W. CLARK, Secretary, de28-tt

Mocking Bird Mining Company, Location of works, Ely Mining District, Lincoln County, Nevada.
Notice is hereby given, that at a meeting of the Board of Trustees of said Company, held on the fifth day of December, 1872, an assessment of ten cents a share was levied upon the capital stock of said Company, payable immediately in United States gold coin, to the Secretary at the office of the Company, Room 21, Hayward's Building, 419 California street, San Francisco, Cal. Any stock upon which said assessment shall remain unpaid on the 10th day of January, 1873, shall be deemed delinquent, and will be duly advertised for sale at public auction, and unless payment shall be made before, will be sold on Friday, January 18th, 1873, to pay the delinquent assessment, together with costs of advertising and expenses of sale.
H. C. KIBBE, Secretary.
Office, Room No. 21, Hayward's Building, 419 California street, San Francisco, Cal.

Norman Gold Mining Company—Location of works, Aqueduct Mining District, Amador County, California.
Notice.—There are delinquent upon the following described stock, on account of assessment levied on the 11th day of November, 1872, the several amounts set opposite the names of the respective shareholders as follows:
Names. No. Certificate. No. Shares. Amount.
Allen, W. Trustee..... 30 100 \$5 00
Boydton, U..... 162 100 5 00
Boydton, U..... 163 100 5 00
Childs, Geo E..... 29 100 5 00
Dore, B. Trustee..... 119 50 2 50
Dore, B. Trustee..... 120 50 2 50
Dore, B. Trustee..... 139 100 5 00
Dore, B. Trustee..... 141 100 5 00
Dore, B. Trustee..... 146 100 5 00
Duane, W. R. Mrs..... 117 100 5 00
Eldridge, G. C. Trustee..... 168 300 15 00
Eldridge, G. C. Trustee..... 17 100 5 00
Eldridge, G. C. Trustee..... 18 100 5 00
Hamphreys, W. T..... 26 100 5 00
Hamphreys, W. T..... 27 100 5 00
Hynemann, S..... 66 100 5 00
Hynemann, S..... 67 100 5 00
Mish, L..... 159 300 15 00
Moon, E. J. Trustee..... 58 100 5 00
Plummer, M. D. Trustee..... 2 500 25 00
Plummer, M. D. Trustee..... 34 80 4 00
Plummer, M. D. Trustee..... 33 80 4 00
Plummer, M. D. Trustee..... 153 100 5 00
Ridley, A..... 133 20 1 00
Sheppard, L..... 64 100 5 00
Thompson, J. M. Trustee..... 9 100 5 00
Thompson, J. M. Trustee..... 10 100 5 00
Thompson, J. M. Trustee..... 11 100 5 00
Thompson, J. M. Trustee..... 12 100 5 00
Thompson, J. M. Trustee..... 17 100 5 00
Thompson, J. M. Trustee..... 62 100 5 00
Trask, J. A..... 20 100 5 00
Trask, J. A..... 114 50 2 50
Trask, J. A..... 115 20 1 00
Trask, J. A..... 116 20 1 00
Truworthy, T. M..... 112 10 5 00
Watson, Wm H. Trustee..... 60 1167 58 35
Watson, Wm H. Trustee..... 75 100 5 00
Watson, Wm H. Trustee..... 85 50 2 50
Watson, Wm H. Trustee..... 93 20 1 00
Watson, Wm H. Trustee..... 94 20 1 00
Watson, Wm H. Trustee..... 95 20 1 00
Watson, Wm H. Trustee..... 121 50 2 50
Watson, Wm H. Trustee..... 122 50 2 50
Watson, Wm H. Trustee..... 123 100 5 00
Watson, Wm H. Trustee..... 124 100 5 00
Watson, Wm H. Trustee..... 125 100 5 00
Watson, Wm H. Trustee..... 126 100 5 00
Watson, Wm H. Trustee..... 127 100 5 00
Watson, Wm H. Trustee..... 128 100 5 00
Watson, Wm H. Trustee..... 129 100 5 00
Williams, W. J..... 157 100 5 00
Williams, W. J..... 158 100 5 00
And in accordance with law, and an order of the Board of Trustees, made on the 11th day of November, 1872, so many shares of each parcel of said stock as may be necessary, will be sold at public auction, at the office of the Company, Room 5 and 6, No. 302 Montgomery street, San Francisco, California, on Thursday, the 23d day of January, 1873, at the hour of 2 o'clock P. M. of said day, to pay said delinquent assessment thereon, together with costs of advertising and expenses of sale.
W. H. WATSON, Secretary.
Office, Room 5 and 6, No. 302 Montgomery street, San Francisco, Cal. de1-tt

Old Providence Mill and Mining Company, Location of works, Hayden Hill Mining District, Lassen County, California.
Notice.—There are delinquent upon the following described stock, on account of assessment levied on the 7th day of November, 1872, the several amounts set opposite the names of the respective shareholders, as follows:
Names. No. Certificate. No. Shares. Amount.
Dean, T. R..... 9 100 \$100 00
McDonald, D. L..... 11 100 25 00
McDonald, D. L..... 38 2500 625 00
And in accordance with law, and an order of the Board of Trustees, made on the 7th day of November, 1872, so many shares of each parcel of said stock as may be necessary, will be sold at public auction, at the office of the Company, No. 412 Montgomery street, San Francisco, Cal., on the 6th day of January, 1873, at the hour of 2 o'clock P. M. of said day, to pay said delinquent assessment thereon, together with costs of advertising and expenses of sale.
FRANK SWIFT, Secretary.
Office, No. 415 Montgomery street, San Francisco, Cal. de21-tt

Ophir Copper, Silver and Gold Mining Company of Placer County, California. Location of works, Ophir, Placer County, California.
Notice is hereby given that at a meeting of the Board of Trustees of said Company, held on the 19th day of Dec. 1872, an assessment of ten (10) cents per share was levied upon the capital stock of said Company, payable immediately in United States gold and silver coin, to the Secretary, at the office of the company, Room 2, Express Building, at 402 Montgomery street, San Francisco, Cal. Any stock upon which said assessment shall remain unpaid on the 25th day of January, 1873, shall be deemed delinquent, and will be duly advertised for sale at public auction, and unless payment shall be made before, will be sold on Monday, the seventeenth day of February, 1873, to pay the delinquent assessment, together with costs of advertising and expenses of sale. By order of the Board of Trustees.
Office—No. 402 Montgomery street, San Francisco, Cal. de28-tt

Piermont Milling and Mining Company— Location of works, Piermont Mining District, White Pine County, Nevada.
Notice.—There are delinquent upon the following described stock, on account of assessment levied on the 21st day of November, 1872, the several amounts set opposite the names of the respective shareholders, as follows:
Names. No. Certificate. No. Shares. Amount.
Cohen, Henry..... 37 50 \$25 00
Cohen, Henry..... 51 10 5 00
Dickinson, E. B..... 62 250 125 00
Dickinson, E. B..... 63 250 125 00
Feusier, Henry..... 24 750 375 00
Feusier, Henry..... 46 143 71 50
And in accordance with law, and an order of the Board of Trustees, made on the 21st day of November, 1872, so many shares of each parcel of said stock as may be necessary, will be sold at public auction, at the office of said Company, on the 24th day of January, 1873, at the hour of 2 o'clock P. M. of said day, to pay said delin-

quent assessment thereon, together with costs of advertising and expenses of sale.
J. W. CLARK, Secretary.
Office, 418 California street, San Francisco, Cal. de1-tt

Quail Hill Mining and Water Company— Location of works, Calaveras County, California.
Notice is hereby given that at a meeting of the Board of Trustees of said Company, held on the 4th day of December, 1872, an assessment of ten dollars per share was levied upon the capital stock of said Company, payable immediately in United States gold coin, to the Secretary, at the office of the Company, No. 438 California street, San Francisco, Cal. Any stock upon which said assessment shall remain unpaid on the 14th day of January, 1873, shall be deemed delinquent, and will be duly advertised for sale at public auction, and unless payment shall be made before, will be sold on Tuesday, the 4th day of February, 1873, to pay the delinquent assessment, together with the costs of advertising and expenses of sale. By order of the Board of Trustees.
Office, 438 California street, up stairs, San Francisco, California. de14

San Francisco Co-operative Land and Building Association.
Notice is hereby given, that the following specified shares of stock in said Association have been, by resolution duly adopted by the Board of Directors, declared forfeited for non payment of instalments due and delinquent thereon, respectively as specified, to wit:
Names. No. Shares. Amount.
John Brys..... 4 \$32 00
Donald Bruce..... 12 90 00
J. D. Baldwin..... 10 70 00
C. Birdsey..... 6 70 00
George F. Coffin..... 10 80 00
A. C. Digges..... 1 11 00
D. O. Field..... 10 80 00
William Huebner..... 2 20 00
T. F. Hudson..... 5 55 00
James Heron..... 25 175 00
Thomas S. Hager..... 6 45 00
Charles S. Healey..... 10 90 00
C. O. Keene..... 4 40 00
L. Kaplan..... 5 30 00
M. Levy..... 2 20 00
E. C. Morton..... 10 60 00
J. F. McDonald..... 5 60 00
J. D. McIntyre..... 3 30 00
P. Plank, Jr..... 3 30 00
F. A. Rouleau..... 10 110 00
L. F. Rowell..... 10 70 00
J. Smith..... 25 175 00
W. H. Woodward..... 5 45 00
Charles W. Banks..... 5 25 00
H. Keulitzer..... 5 25 00
James Story..... 5 25 00
Joe Silva..... 2 10 00
W. H. Wright..... 10 50 00
The above designated shares will be sold at auction, to the highest and best bidder, for cash, at the office of the Secretary, No. 306 Montgomery street, San Francisco, on Saturday, the 4th day of January, A. D., 1873, at 12 o'clock noon, unless the sums due thereon, and above specified, together with fines due thereon, and all expenses and charges of sale, are previously paid. By order of the Board of Directors.
H. B. CONGDON, Secretary.
San Francisco, December 13, 1872. de1

Office of the San Francisco Co-operative Printing Company, 412 Commercial street, San Francisco, Cal., December 1st, 1872.
In accordance with a resolution of the Board of Trustees of the San Francisco Co-operative Printing Co., held this day, a special meeting of the Stockholders of said Company is hereby called, the same to be held at the office of said Company, on Wednesday January 8th, 1873, at 12 o'clock M., to take into consideration the propriety of increasing the capital stock of said Company from one hundred shares, above specified, to one hundred shares of one hundred dollars each, the present capital stock, to forty thousand dollars, divided into two hundred shares of two hundred dollars each.
PETER COOK,
JOHN KANE,
R. A. JAMES,
B. H. DALY,
Trustees.
de1-tt

Spring Mountain Tunnel Company—Loca- tion of works, Lincoln County, Nevada.
Notice is hereby given, that at a meeting of the Board of Trustees of said Company, held on the 17th day of December, 1872, an assessment of twenty cents per share was levied upon the capital stock of said Company, payable immediately in United States gold and silver coin, to the Secretary, at the office of the Company, Room 5 and 6, No. 302 Montgomery street, San Francisco, Cal. Any stock upon which said assessment shall remain unpaid on the 25th day of January, 1873, shall be deemed delinquent, and will be duly advertised for sale at public auction, and unless payment shall be made before, will be sold on Monday, the 17th day of February, 1873, to pay the delinquent assessment, together with costs of advertising and expenses of sale. By order of the Board of Trustees.
Office, 37 New Merchant's Exchange, California street, San Francisco, Cal. de21

Virginia Consolidated Mining Company— Location of mines: Kearsage Mining District, Inyo County, State of California.
Notice is hereby given, that at a meeting of the Board of Trustees of said Company, held on the 11th day of December, 1872, an assessment of two cents per share was levied upon the capital stock of said Company, payable immediately in United States gold coin, to the Secretary, at the office of the Company, 318 California street, San Francisco. Any stock upon which said assessment shall remain unpaid on the 25th day of January, 1873, shall be deemed delinquent, and will be duly advertised for sale at public auction, and unless payment shall be made before, will be sold on Monday, the 10th day of February, 1873, to pay the delinquent assessment, together with costs of advertising and expenses of sale. By order of the Board of Trustees.
Office, No. 318 California street, San Francisco, Room No. 13, third floor. de1-tt

Yule Gravel Mining Company—Location of works Yule Claims, Township No. 3, Placer County, State of California.
Notice is hereby given, that at a meeting of the Board of Trustees of said Company, held on the 18th day of December, 1872, an assessment of twenty cents (20 cts.) per share was levied upon the capital stock of said Company, payable immediately in United States gold coin, to the Secretary, at the office of the company, Room 5 and 6, No. 302 Montgomery street, San Francisco, Cal. Any stock upon which said assessment shall remain unpaid on Saturday, the 18th day of January, 1873, shall be deemed delinquent, and will be duly advertised for sale at public auction, and unless payment shall be made before, will be sold on Monday, the 10th day of February, 1873, to pay the delinquent assessment, together with costs of advertising and expenses of sale. By order of the Board of Trustees.
Office, Room 5 and 6, No. 302 Montgomery street, San Francisco, Cal. de1

CLARK CHURCHILL,
Counselor at Law.
OFFICE.....Rooms 11 and 12 Montgomery Block,
SAN FRANCISCO. 25v25-3m
CAUTION.
Betts's Patent Capsules.
The public are respectfully cautioned that BETT'S Patent Capsules are being Infringed.
BETT'S name is upon every Capsule he makes for the leading Merchants, and is blown in glass above the name of the ONLY INVENTOR and SOLE MAKER in the United Kingdom,
MANUFACTURERS—1, WHARF-ROAD, CITY-ROAD, LONDON, AND BORNEAU, FRANCE.

Machinists and Foundries.

ESTABLISHED 1851.

PACIFIC IRON WORKS,

First and Fremont streets.

SAN FRANCISCO

J. P. RANKIN, A. P. BRAYTON,
GEO. W. FOGG, Superintendent.**Steam Engines and Boilers,**

MARINE AND STATIONARY,

IRON AND BRASS CASTINGS

Mining Machinery of Every Description,

And all other classes of work generally done at first-class establishments, manufactured by us at the lowest prices, and of the best quality.
Particular attention paid to Jobbing Work and Repairs.N. B.—Sole Agents for sale of HUNTOON'S CELEBRATED PATENT GOVERNOR.
18v20-3m GODDARD & CO.**FULTON****Foundry and Iron Works.**

HINKLEY & CO.,

MANUFACTURERS OF

TEAM ENGINES.**Quartz, Flour and Saw Mills,**

also Improved Steam Pump, Brodie's Improved Crusher, Mining Pumps, Amalgamators, and all kinds of Machinery.

M. E. corner of Tehama and Fremont streets, above Howard street, San Francisco. 3-47

GEORGE T. PRACY, MACHINE WORKS,109 and 111 Mission Street,
SAN FRANCISCO.

These Works have lately been increased, by additional Tools, and we are now able to turn out any kind of work, equal to and cheaper than any establishment in the State; that is to say:—

STEAM ENGINES,
Flour and Saw Mills,
QUARTZ MACHINERY
Printing Presses,

AND MACHINERY MADE OF EVERY DESCRIPTION.

Improved Safety Store Hoists,

Fitted with Cutting's Patent Cams, unequalled for safety, convenience and cheapness. This Hoist can be built for about half the price of any other in use. To be seen at HAWLEY & CO.'S.

ALSO, MANUFACTURER AND SOLE AGENT FOR
Pracy's Celebrated Governor.
TURNING LATHES, Etc., constantly on hand.
4v23tf**UNION IRON WORKS,**
Sacramento.**ROOT, NEILSON & CO.,**

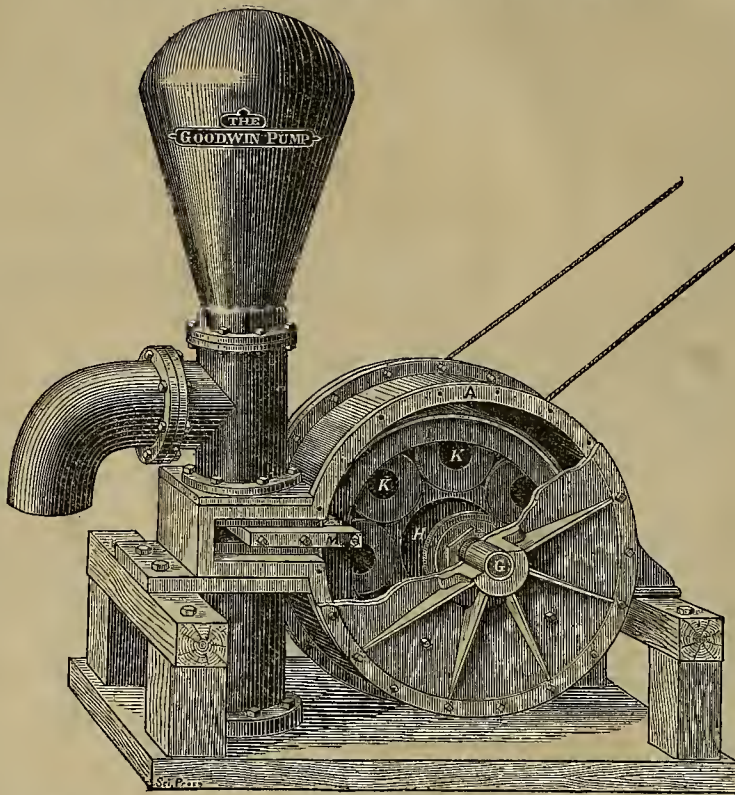
MANUFACTURERS OF

STEAM ENGINES, BOILERS,
CROSS PATENT BOILER FEEDER AND SEDIMENT COLLECTORDunbar's Patent Self-Adjusting Steam Piston
PACKING, for new and old Cylinders.And all kinds of Mining Machinery.
Front Street, between N and C streets,
SACRAMENTO CITY.**PACIFIC****Rolling Mill Company,**

SAN FRANCISCO, CAL.

Established for the Manufacture of
RAILROAD AND OTHER IRON
—AND—
Every Variety of Shafting,
Embracing ALL SIZES of
Steamboat Shafts, Cranks, Piston and Connecting Rods, Car and Locomotive Axles and Frames**HAMMERED IRON**

Of every description and size.

Orders addressed to PACIFIC ROLLING MILL COMPANY Post Office, San Francisco, Cal., will receive prompt attention.
The highest price paid for Scrap Iron. 5v143**THE GOODWIN PUMP.**This Pump, which was awarded the PREMIUM at the last State Fair, where a large number of Pumps were exhibited, is the CHEAPEST, MOST EFFICIENT and DURABLE PUMP now manufactured.
We are rapidly increasing our Patterns and extending our facilities for manufacturing, but have not yet been able to fully supply the demand. As our Pump has no valves, it is the best Pump for mines where water containing sand or sediment, or where hot liquids have to be pumped.

It is Unsurpassed for Hydraulic Mining,

And will throw a stream of from two to six hundred inches of water with a force equal to a fall of two hundred and fifty feet. It is peculiarly adapted to windmills for irrigating, or domestic purposes, and is equally as efficient and noiseless at a high or low speed, the water raised being in the ratio of its revolutions. Our large irrigating Pumps will throw twenty thousand gallons per minute.

PUMPS FOR EVERY PURPOSE AND ALL CAPACITIES,

MANUFACTURED BY

GOODWIN & WEST,

No. 235 FIRST STREET, San Francisco (Miner's Foundry).

ALL WORK GUARANTEED.

Send for an Illustrated Circular.

16v25-88

**H. J. BOOTH & CO.,
UNION IRON WORKS,**(The Oldest and most Extensive Foundry on
the Pacific Coast.)Cor. First and Mission Sts.,
SAN FRANCISCO.Marine, Locomotive and Stationary Engines
Quartz Crushing and Amalgamating
Machines, Mill Irons and Brass and Iron
Castings, of every description,
made to order.Steamboat Repairing, Boiler Making, Turn-
ing and Finishing,
EXECUTED WITH DISPATCH.Beet Sugar Machinery complete in every part—made
specialty.**OIL MACHINERY.**A complete set of Machinery of our own design and
patent for extracting oil from Castor Bean, dispensing
with Hair Cloth. Also Machinery for Flax Seed Oil,
Mustard Seed Oil, and Sun Flower Seed Oil.**MARBLE MACHINERY**

For sawing Marble of any thickness or size.

Irrigating Pumps, Steam Pumps.Plans, Estimates, and Advice promptly supplied.
H. J. BOOTH, GEO. W. PRESCOTT, IRVING M. SCOTT
4v24-1y81amr**FOUNDERS AND MACHINISTS.**

TYRRELL & CUMMINGS, PROPRIETORS OF THE

Union Iron Works,No. 320 South C Street.....on the Divide,
VIRGINIA, NEV.

Manufacture Mill and Mining Machinery,

From the Smallest to the Largest Capacity,
on the Shortest notice, and
Guarantee Satisfaction.N. B.—Eastern Nevada and Utah Millmen, patronize
near home and save money. dc21-3t**A. HANKE'S****IRON FOUNDRY,**

CORNER MAIN AND HARRISON STREETS,

Entrance on Main Street.....San Francisco.

Every Description of Ornamental Work,
Stove and French Range Work, grate and fender work,
small machines of all descriptions, house
work, etc., promptly attended to,
25v25-8m

GEO. W. PRESCOTT. C. W. SCHEIDEL. W. R. ECKART

**PRESCOTT, SCHEIDEL & CO.,
MARYSVILLE FOUNDRY.**

Corner of B and Fourth streets, Marysville, Cal.

MANUFACTURERS OF

STEAM ENGINES,

STATIONARY AND PORTABLE

SAW AND GRIST MILLS,

Hydraulic Machinery,

Quartz Crushing and Amalgamating
Machinery

Of every description, constantly on hand.

Plans and estimates furnished upon application.
Repairs upon all kinds of Machinery promptly made,
and at moderate charges.
Having unrivalled facilities, we are prepared to make
to order, at short notice, anything required in our line.
Specimens of our work may be seen in all the mining
regions on this coast.**THE RISDON****Iron and Locomotive Works.**INCORPORATED.....APRIL 30, 1868.
CAPITAL.....\$1,000,000.**LOCATION OF WORKS:**Corner of Beale and Howard Streets,
SAN FRANCISCO.Manufacturers of Steam Engines, Quartz and Flour
Mill Machinery, Steam Boilers (Marine, Locomotive
and Stationary), Marine Engines (High and Low Pres-
sure). All kinds of light and heavy Castings at lowest
prices. Cams and Tappets, with chilled faces, guaran-
teed 40 per cent. more durable than ordinary iron.**Directors:**Joseph Moore, C. J. Brenham, C. E. McLane,
Wm. Norris, Wm. H. Taylor, Lloyd Tevis,
James D. Walker.WM. H. TAYLOR.....President
JOSEPH MOORE.....Vice-President and Superintendent
LEWIS B. MEAD.....Secretary
24v17-07**Miners' Foundry and Machine Works,**

CO-OPERATIVE,

First Street, bet. Howard and Folsom, SAN FRANCISCO

Machinery and Castings of all kinds.

OCCIDENTAL FOUNDRY,

137 and 139 First st., near the Gas Works, San Francisco.

STEIGER & BOLAND,

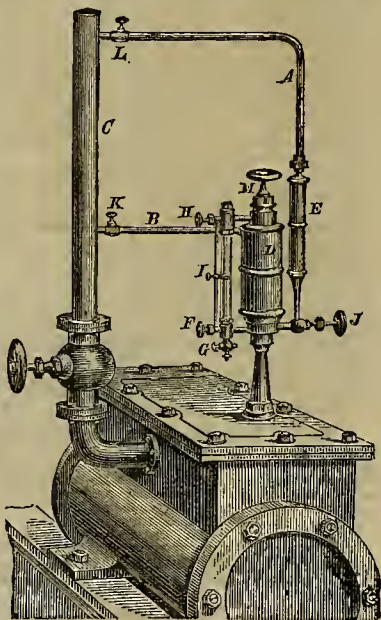
IRON FOUNDERS.IRON CASTINGS of all descriptions at short notice
All orders punctually executed in time agreed on
Particular attention paid to making superior Shoes
and Dies. Among the special castings of this Foundry
are the well known CALLAHAN GRATE BAR, of super-
ior merit for burning screenings—all size Bars.
STRATTON'S JACK SCREWS, all sizes. Superior, com-
pact and effective Horse Powers, Pumps, Agricultural
Castings, Ingot Moulds, Assaying and Refining Retorts,
and Kettles, and a great variety of other and special
castings.

STEIGER & BOLAND Proprietors.

Steiger & Boland are the sole Manufacturers of the
Improved Heppburn Roller Pan. The patterns
having all the improvements to those Pans, are at the
Occidental Foundry, enabling the Establishment to
deliver all pans and parts thereof with uniformity,
finished in the best style, and at the lowest possible
price. Pan Castings furnished the trade, with liberal
facilities for erection, &c. All persons are cautioned
against making, selling or using these Pans, except
through the authorized agents and manufacturers, viz.,
Steiger & Boland, of the Occidental Foundry, S. F.

22v25-8m

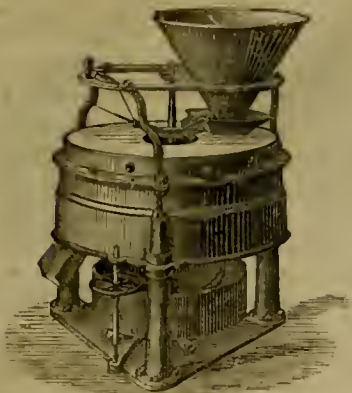
WM. H. HEPBURN.

THOMPSON BROTHERS,**EUREKA FOUNDRY,**129 and 131 Beale street, between Mission and Howard,
San Francisco.**LIGHT AND HEAVY CASTINGS,**
of every description, manufactured. 24v16qr**CALIFORNIA BRASS FOUNDRY,**No. 125 First street, opposite Minna,
SAN FRANCISCO.ALL KINDS of Brass, Composition, Zinc, and Bahilit Meta
Castings, Brass Ship Work of all kinds, Spikes, Sheathing
Nails, Kiddor Braces, Hinges, Ship and Steamboat Belts and
Gongs of superior tone. All kinds of Cocks and Valves, 3/4
Inch Pipes and Nozzles, and Hose Couplings and Connec-
tions of all sizes and patterns, furnished with dispatch.
25v PRIORS MODERATE. 25v
J. H. WOOD V. KINGWELL.**Machinery.****FOR SALE.—A FOUNDRY AND MACHINE**
Shop, in a business country town; terms, half cash—
balance on time. Apply at 129 and 131 Beale street. To
be sold on account of death of one of the partners. 3t**N. Seibert's Eureka Lubricators.****THE HIGHEST PREMIUM**Awarded by the Mechanics' Institute Fair, San Fran-
cisco, and State Fair, Sacramento, 1871.These Lubricators are acknowledged by all engineers
to be superior to any they have ever used; feed con-
stantly by pressure of condensed water, supplied by
pipe A, regulated under the oil by valve J, and forced
out through check valve and pipe B into the steam pipe
C; it then becomes greasy steam, passes to all the
valves and cylinder at every stroke of the engine; glass
tube I indicates amount used per hour. Packing on
rods and stems lasts longer, and the rings on the piston
will not corrode. One pint of oil will last from three
to six days, according to speed and size of engine; I,
sliding gauge; K, valve to shut off when engine stops;
H, F, valves to shut off in case of frost; steam does not
enter the cup; it is always cool; warranted to give satis-
faction. Patented February 14, 1871. Manufactured by
California Brass Works, 125 First street, S. F. 24v23tf**H.B. MARTIN & CO.
MACHINISTS
AND
BUILDERS**ALL KINDS
Hydraulic
ELEVATORS,
REVERSIBLE
Hoisting
Engines,**STEAM AND HYDRAULIC ENGINES**Power Pumps and Pressure Rams,
Sewing Machine Motors, Etc.,

NO. 13 FREMONT STREET,

Nelson & Doble's Building.....San Francisco.
16v25-4f

MILL STONES.



Portable Mills, Eureka Smut Machines
Bran Dusters, Dufour & Co.'s Celebrated Dutch Anchor
Bolting Cloth, and General Mill Furnishing.

TRAVIS & WAGNER,
41 First street, San Francisco.

POWER, TAITER & CO.,

MANUFACTURERS OF



WOOD-WORKING MACHINERY.

3063 Chestnut street, (West end Chestnut street Bridge)
PHILADELPHIA.
Woodworth Planers a Specialty. 4v25-3m

Notice is hereby given, that the copartnership heretofore existing between A. J. Severance, Charles W. Randall and J. Gus. Burt, under the firm name of "Severance, Holt & Co.," is this day dissolved by mutual consent. A. J. Severance, having purchased all the interest of his late partners, will continue the business of manufacturing and selling Diamond Drills as before, under the style of A. J. Severance & Co. Dated San Francisco, Nov. 24, 1871.
Office, 315 California street. A. J. SEVERANCE,
CHAS. H. RANDALL,
J. GUS. BURT.
22-v23-4t

FARCIOT & VANDRAKE,
GENERAL MACHINISTS,
No. 13 Fremont Street [Nelson & Doble's Building],
San Francisco, Cal.

NOTICE.—Special attention called to our new STEAM PUNCHING PRESS, which we have on hand for use of customers. Capacity, 1800 per hour. All kinds of Dies and Punches made to order. 23v25-3m

THEODORE KALLENBERG,

MACHINIST,

and Maker of Models for Inventors. All kinds of Dies
Stamps and Punches made. Also, all kinds of
Small Gears Cut.
Repairing done on very Reasonable Terms and in the
best manner. No. 32 Fremont street, S. F. 19v23-3m

FOR SALE.

LENOIR GAS ENGINE,

French Half Horse Power,

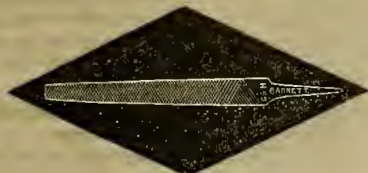
Equal to English Full One Horse Power, with Battery
and everything complete. Price \$600. Inquire at
GUIDE OFFICE, 521 Clay street, third floor. 421-4t

CALDWELL'S

Improved Stop Governor,

Manufactured at the CYCLOPS MACHINE WORKS, 113
and 115 Beale street, San Francisco. WM. CALDWELL.
3v24-3m

BLACK DIAMOND FILE WORKS.



G. & H. BARNETT,
Manufacturers of Files of every Description,
Nos. 39, 41 and 43 Richmond street,
Philadelphia, Pa.

MILL SAW FILES A SPECIALTY.
18v25-1y

Steam Boiler Manufactory

—OF—

JAMES H. SHANLEY,

(Successor to D. McDonald.)

Oregon street, below Front.....SAN FRANCISCO.

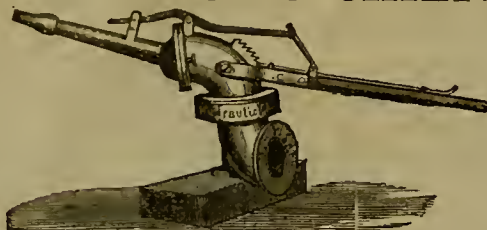
ALL SORTS OF STEAM BOILERS
Made to order and repaired.

Also all kinds of Sheet Iron Work done promptly,
and at prices to suit the times. 25v25-3m

HYDRAULIC CHIEF.

FISHER'S
KNUCKLE
JOINT
AND
NOZZLE

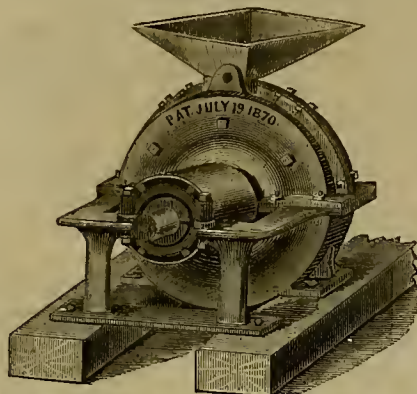
IS THE
Cheapest and Best
Hydraulic Machine
in use.



The only reliable party in the Hydraulic business who protects his patrons.
9v23-1t Address F. H. FISHER, Nevada, Cal.

HYDRAULIC MINERS, TAKE NOTICE—I hereby caution Miners and Manufacturers against making, buying, selling or using a Hydraulic Machine or Joint known as the Little Giant, manufactured and sold by R. R. & J. Craig and Richard Hoskin, as the same is an infringement upon the invention of the machine known as FISHER'S HYDRAULIC CHIEF, secured by Letters Patent, No. 110,222, dated Dec. 20, 1870. All parties participating in such infringements will be rigorously prosecuted. Nevada, Jan. 13th. F. H. FISHER.

THE LIGHTNING MILL.



WALKER BROS. & CO., Twenty-third and Wood Streets, Philadelphia, Sole Manufacturers of Stewart's Celebrated Patent Bone Mills and Crushers, A. W. Straub & Co.'s Patent Revolution French Burr Mill and A. Duval's Patent Centrifugal Pumps.

THE
LIGHTNING MILL

For Pulverizing Quartz,

"Charleston Rock," and all Native Phosphates,
Flint, Feldspar, Iron Ore, Manganese, Antimony,
Carbon, Corundum, Old Crucibles, Barytes, Brimstone, Slate, Soapstone, Graphite, Glass, Marble,
Plaster, Anthracite and Bituminous Coals, etc.

WM. STEWART'S

Patent Bone Mills and
Crushers.

For Grinding Bones, Rock, Quartz, and all hard
substances; also, Corn, Wheat, Oats, Barley, Coffee,
Spices, etc.

CAMERON'S

MINING STEAM PUMPS.

DAVID STODDART,

114 Beale Street, - - - - - SAN FRANCISCO.

PACIFIC STONE COMPANY.



Ransome's Patents,

For which Commissioners for the International Exhibition of 1862 awarded the Prize Medal, and Gold Medal at the Mechanics' Institute Fair, 1871, of San Francisco.

The Pacific Stone Company call the especial attention of Architects, Engineers and the public in general, to the SUPERIOR QUALITY of the Stone now being manufactured by them in this city under the Ransome's Patents. They make to order and keep in stock:

Building Fronts, Water Pipes
Sinks, Monuments, Fountains,
Tiles, Copings for Walls,
Filters, etc., etc.,
Together with Ransome's Celebrated Free-Grit Grindstones, all of which we guarantee superior, and at a price far below that of hand-cut work.

The attention of private parties intending to build is respectfully solicited.

Office, No. 10 BUSH STREET, San Francisco.

J. M. STOCKMAN,

Manufacturer of

PATTERNS and MODELS,
(Over W. T. Garratt's Brass Foundry).

N. W. corner Natoma and Fremont streets, S. F. Entrance on Natoma street. 5v23-3m

NELSON & DOBLE,

AGENTS FOR

Thomas Firth & Sons' Cast Steel.



MANUFACTURERS OF
Sledges, Hammers, Stone
Cutters', Blacksmiths'
and Horse-Shoers'
Tools.



13 and 15 Fremont street, near Market, San Francisco
10v14-4t

California File Manuf'g Co.

Potrero, Solano street, bet. Tennessee and Minnesota
streets, SAN FRANCISCO.

Manufacturers of New Files.

Old Files re-cut and warranted equal to new.
REAPER and MOWER SECTIONS, BARS
AND KNIVES COMPLETE,
at a saving of 50 per cent. Orders from the country
promptly attended to. 9v19-by

SAN FRANCISCO

SCREW BOLT WORKS,

PHELPS BROTHERS, Proprietors.

MANUFACTURERS OF ALL KINDS OF

Machins Bolts, Bridges Bolts, and Ship or
Band Bolts.

13 and 15 Drumm Street, San Francisco. 4v24-1y

AVERILL'S

CHEMICAL PAINT.

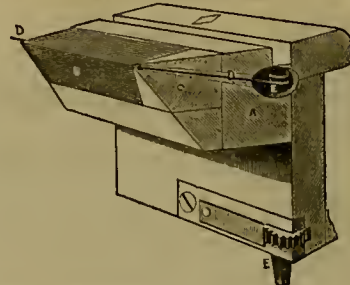
Of any desired Shade or Color,

Mixed ready for application, and sold by the gallon.

It is Cheaper, Handsomer, more Durable and Elastic
than the best of any other Paint.

Office, corner Fourth and Townsend streets, San
Francisco. Send for sample card and price list.
15v23-3m HELY & JEWELL, Agents.

Sketch of Delaney's New Patent Cushion.



DESCRIPTION OF ENGRAVING.

E, pin or regulator, extending into rail; D, steel wire,
tension from pin into and through rubber cushion; B, rub
ber cushion; C, is end of rubber cushion; A, lining.
Their construction is of the simplest kind, thus making
no heavy expense for superfluous elaboration. The im
provement is a steel wire running lengthwise, and commu
nicating with a pin at each end and inside of the rails;
the wire is imbedded in the rubber cushion, near its edge or
surface. The pin mentioned is controlled and operated
upon by a key, regulating the tension of the wire, accord
ing to the necessities of the case. It keeps the edge of the
cushion straight and sharp. It prevents the rubber berde
ning from the impingement of the ball; and, above all
other considerations, the angles are bound to be perfectly
correct.

The ball never lumps from the table, bowever severe the
stroke. It makes no noise when leaving the cushion.
Nine cushions are made upon our tables with the same
degree of force requisite to make six up n any other.

These unrivalled cushions are self-protective and will re
tain their elasticity other is hot, cold, dry, or damp weather,
almost forever.

Thousands of Delaney's cushions have been introduced
throughout California and the Great West, where the
large-t billiard manufacturers now make exclusive use of
them, to the eminent satisfaction of their patrons.

Sole Agents for the Pacific States, China, Japan, Saad
wicb Islands, and Australia.

JACOB STRAHLE & CO.,
533 Market Street, opposite Sansome and Sutter. 2m

RAWHIDE
BELTING & LACING
ROPES & CHORDS
MADE BY
H. ROYER
437 BRANNAN STR. S.F.
18v4-2am-bp

The California Powder Works

No. 314 CALIFORNIA STREET,
SAN FRANCISCO.

Manufacturers and have constantly on hand

SPORTING,
MINING,
And BLASTING
POWDER,

OF SUPERIOR QUALITY, FRESH FROM THE
MILLS. It being constantly received and transported
into the interior, is delivered to the consumer within a
few days of the time of its manufacture, and is in every
way superior to any other Powder in Market.
We have been awarded successively

Three Gold Medals

By the MECHANICS' INSTITUTE and the STATE AG
RICULTURAL SOCIETY for the superiority of our
products over all others.

We also call attention to our

HERCULES POWDER.

Which combines all the force of other strong explosive
now in use, and the lifting force of the BEST BLASTING
POWDER, thus making it vastly superior to any other
compound now in use.

A circular containing a full description of this Pow
der can be obtained on application to our Office.

16v20-3m JOHN F. LOHSE, Secretary.

SHEET IRON PIPE.

THE

Ridson Iron and Locomotive Works

Corner Howard and Beals Streets,

Are prepared to make SHEET IRON and ASPHALTUM
PIPE, of any size and for any pressure, and contract to
lay the same where wanted, guaranteeing a perfect
working pipe with the least amount of material.
Standard sizes of railroad Car Wheels, with special
patterns for Mining Cars. These small wheels are made
of the best Car Wheel Iron, properly chilled, and can be
fitted up with the improved axle and box—introduced by
this company, and guaranteed to outlast any other
wheels made in this State.

All kinds of Machinery made and repaired.
24v22-3m JOSEPH MOORE, Superintendent.

FRED. KRAJEWSKI,

MANUFACTURER OF TOOLS

—FOR—

Molding, Turning, Carving, Etc
Mortise Chisels, Blind Chisels, Crotch
Chisels, and also all kinds of Screws
for Stair Work and Sash Joints
on hand and made
to order.

Berry street, bet. Fourth and Fifth, SAN FRANCISCO.
25v23-4t

BUY BARBER'S BIT BRAOE.

New Incorporations.

CHALLENGE M. Co.—Dec. 27. Location: Owyhee county, Idaho. Capital, \$750,000, in 15,000 shares. Trustees—M. J. McDermott, O. H. Bogart, Robert Beggs, Tyler Curtis and T. J. Owens.

NORTH AMERICAN G. AND S. M. Co.—Dec. 28. Location: In California, Nevada, New Mexico, Utah, Colorado and Arizona. Capital, \$2,500,000, in 100,000 shares. Trustees—J. O. Lemmon, J. W. Whitney, Wm. H. Adams, George A. S. and Samuel Purdy.

GOLDEN GATE GRAVEL M. Co.—Dec. 28. Location: Sierra County, California. Capital, \$50,000, in 50,000 shares. Trustees—Geo. A. Treadwell, F. Saffred, C. D. Dunn, H. C. Hyde and Jas. French.

DIAMOND AND ELGIN S. AND COPPER M. Co.—Dec. 28. Location: Utah Territory. Capital, \$3,000,000, in 30,000 shares. Trustees—George Helm, William Lapham, Samuel Purdy, Henry E. Miller and Frank Mayer.

SOUTH HILL GRAVEL M. Co.—Dec. 28. Location: Brushwell District, county of Calaveras, Cal. Capital, \$100,000, in 1,000 shares. Trustees—George F. Sharp, J. C. Stobbins and T. F. Crouse.

NORTH PACIFIC TELEGRAPH CO.—Dec. 30. Objects: To construct and maintain a principal line of telegraph from San Francisco to Crescent City, with such branch lines connecting with said principal lines as may be thought proper. The said principal line of telegraph will be over the following general route, to wit: Commencing at San Francisco and running thence northerly, following the general direction of the coast of the Pacific Ocean through the counties of Marin, Sonoma, Mendocino, Humboldt, Klamath and Del Norte to Crescent City; and the principal points connected thereby will be San Francisco, Sausalito, Tomales, Duncan's Mills, Point Arena, Mendocino City, Petrolia, Ferndale, Eureka, Arcata, Trinidad, Orleans Flat and Crescent City. Capital stock, \$100,000, in 1,000 shares. Trustees—Calish B. May, Frances C. May, M. H. Turill, Wm. F. Halsey and J. Collins.

STANISLAUA WATER CO.—Dec. 30. Objects: To conduct, by means of canals, ditches, flumes, and such other means as may be necessary or convenient, the waters of and from the Tuolumne, Stanislaus and Merced rivers, over the various parts of country lying within twenty miles of these rivers, and for the purpose of California, to be used for purposes of mining, irrigation, flottage and carrying freight, water stock and for driving machinery; also to obtain, hold, work, use and dispose of mining and farming lands, other real estate, stock and water-craft. Capital stock \$4,000,000, in 400,000 shares. Trustees—S. J. Doe, J. W. Shaw, Charles Elliot, Abner Doble, N. W. Spaulding and M. A. Weston.

MINERS' POUNDRY AND MACHINE WORKS (CO-OPERATIVE).—Dec. 30. Object: Of buying, selling and manufacturing machinery, castings and iron works in all its branches. Capital stock, \$500,000. Trustees—Cyrus Palmer, H. B. Angell, and E. L. Moulthrop.

SAN BLAS M. AND COMMERCIAL CO.—Dec. 30. Object: To carry on business in mining, gold, silver, precious stones and base metals, and conduct the business of agriculture, stock raising, and all other commercial purposes in the United States of America, Mexico and South America. Capital stock, \$10,000,000, in 100,000 shares. Trustees—William T. Robinson, M. G. Pritchard, E. H. Bryan, S. Heydenfeldt, Jr., and H. H. Hubbard.

WASHINGTON HEIGHTS CONS. M. Co.—Dec. 30. Location: Philadelphia Mining District, in Mono County, Nevada. Capital stock, \$3,000,000. Trustees—W. F. Leon, L. W. Ferris, W. F. Bulford, J. F. Greenman and D. C. Ferris.

STAPLES M. Co.—Dec. 30. Location: Cove Mining District, Kern county, Cal. Capital stock, \$3,000,000. Trustees—Alphons Shattuck, J. W. Moyle, C. M. Peck, C. J. Eaton and F. E. Shattuck.

ST. LAWRENCE M. Co.—Dec. 30. Location: Eureka, Lander county. Capital stock, \$5,000,000. Trustees—H. C. Bennett, J. H. Adams, C. W. Leib, N. G. Schofield and Jas. McGrath.

WASHINGTON M. Co.—Dec. 30. Location: Gold Hill M. District, Storey county, Nevada. Capital stock, \$1,000,000. Trustees—P. J. White, W. F. Leon, R. E. Brewster, S. Rosenblatt and R. P. Keating.

BAILEY CONS. M. Co.—Dec. 30. Location: Storey county. Capital stock, \$2,500,000. Trustees—P. J. White, W. F. Leon, R. E. Brewster, S. Rosenblatt and R. P. Keating.

NORTH MONTE CRISTO M. Co.—Dec. 30. Location: Storey county, Nevada. Capital stock, \$2,000,000. Trustees—R. H. Sherwood, W. H. Martin, R. P. Keating, W. C. Burnett and P. J. White.

ANNA M. Co.—Dec. 30. Location: Virginia M. District, Storey county, Nevada. Capital stock, \$3,000,000. Trustees—John Landers, A. K. Grimm, Coll Deane, R. F. Bunker and E. Landers.

ENTERPRISE M. AND TUNNEL CO.—Dec. 30. Location: Sugar Pine Mining District, Tuolumne county, Cal. Capital stock, \$2,000,000. Trustees—Jas. L. King, G. W. Smiley and A. H. Lissak, Jr.

SANTA MARIA GOLD M. Co.—Dec. 30. Location: Tuolumne county, California. Capital stock, \$2,000,000. Trustees—Richard Ivers, Coll Deane, L. Gilson, J. M. Burtell and Geo. Sleeper.

MONTREY AGRICULTURE AND M. Co.—Dec. 30. Object: Purchasing, cultivating and selling the Gavilan Ranch, containing 9,000 acres, more or less, in Monterey county, and working the gold and silver bearing quartz vein or lode, known as the Monterey Gold and Silver Mine, located on said ranch. Capital stock, \$2,000,000. Trustees—P. J. White, G. T. Knox, A. M. Thompson, J. S. Maxwell and J. B. Post.

ANTONY M. AND M. Co.—Dec. 30. Location: State of California. Capital stock, \$3,000,000. Trustees—Jonas Lincoln, H. C. Howard and Joseph Nourse.

WOONHILL M. ANN M. Co.—Dec. 30. Location: Utah Territory. Capital stock, \$3,000,000. Trustees—Jonas Lincoln, H. C. Howard and J. P. Nourse.

HENRY CLAY M. Co.—Dec. 30. Location: Mariposa county, Cal. Capital stock, \$1,000,000. Trustees—C. F. McDermott, T. F. Cronise, W. H. V. Cronise and D. F. Verdenal.

ORANGE CONS. M. Co.—Dec. 30. Location: Eureka District, Lander county, Nev. Capital stock, \$5,000,000. Trustees—Jas. Nesbitt, Jas. Williams, N. P. Cook, John Chamberlain and E. H. Rixford.

CHESCENT M. Co.—Dec. 30. Location: Ely District, Nev. Capital stock, \$2,500,000. Trustees—M. A. Sharp, A. L. Muller, G. W. Allen, George Thompson and Wm. Paulding.

ESPERANZA M. Co.—Dec. 30. Object: To buy, sell and lease mines and construct water ditches, etc., in California. Capital stock, \$2,000,000. Trustees—E. B. Dorsey, T. F. Cronise and J. L. King.

HAWLEY CONS. M. Co.—Dec. 30. Location: State of Nevada. Capital stock, \$5,000,000. Trustees—W. Gashwiler, B. P. Keating, P. J. White and F. Leon.

TUOLUMNE M. AND M. Co.—Dec. 30. Location: Tuolumne county, Cal. Capital stock, \$1,000,000. Trustees—James G. Jeffreys, D. H. Crocker, W. H. V. Cronise, John Landers and R. A. Cochrane.

CHUCKY G. M. Co.—Dec. 30. Location: Big Canon District, El Dorado county, Cal. Capital stock, \$1,200,000. Trustees—J. D. Fry, S. W. Lee, W. H. Smith, W. I. Kip, Jr., and C. Koopmanschap.

HAMBURG CONS. M. Co.—Dec. 30. Location: Eureka District, Lander county, Nev. Capital stock, \$5,000,000. Trustees—G. T. Layton, G. F. Bragg, O. F. Gilman, J. O. Wilgus and D. L. Phillips.

BLUE LENSE M. Co.—Dec. 30. Location: El Dorado county, Cal. Capital stock, \$1,000,000. Trustees—John Middleton, S. W. Lee, W. I. Kip, Jr., F. F. Avery and W. S. Campbell.

ALKADIN G. AND S. M. Co.—Dec. 30. Location: Ely District, Nevada. Capital stock, \$3,000,000. Trustees—Hector Dutcher, John Sherwood, Benj. Dore, E. L. Peckham, and F. Westhouse.

KANAKA M. Co.—Dec. 30. Object: To mine in the States of California, Nevada, and Territories of Utah, Colorado, Arizona and Washington; to buy, sell and lease real estate, mines, tunnels, ditches and general merchandise. Capital stock, \$3,000,000. Trustees—

James Winter, C. W. Carter, S. Storer, H. H. Pearson and G. F. Irvine.

CHOCOLATE ANTEAN FRANCISCO M. Co.—Dec. 30. Location: Nevada and California, Utah, Idaho, Colorado and Arizona. Capital, \$5,000,000. Trustees—W. Lapham, S. C. Fields, F. Mayer, O. D. Coss, W. L. Ustic, James Oerson and J. W. Gashwiler.

WIDE WEST G. AND S. M. Co.—Dec. 30. Location: Ely District, Nevada. Capital, \$3,000,000. Trustees—J. M. Williams, J. M. Coss, S. D. Williams, J. A. Albertson and S. A. Raymond.

EAOLE M. AND M. Co.—Dec. 30. Location: State of Nevada. Capital, \$3,000,000. Trustees—Henry P. Wood, E. M. Patten, Jr., J. Tyler, Jr., F. M. Brown and J. N. Wilber.

COOS BAY CONS. COAL M. Co.—Dec. 30. Location: Coos county, Oregon. Capital, \$5,000,000. Trustees—R. H. Rogers, A. A. Jennings, C. B. Land, R. Sherwood and A. K. P. Harrison.

SAN BENTO COAL M. Co.—Dec. 30. Location: Monterey county, Cal. Capital, \$3,000,000. Trustees—S. M. Locke, Jos. Tilden, A. A. Watkins, Robert Taylor and D. Wilson.

REVENUE M. Co.—Dec. 31. Location: Inyo Co., Cal. Capital stock, \$50,000. Trustees—T. B. Wingard, J. P. Wingard, W. H. Barker and A. F. Bernard.

DIAMOND-SPRING CONS. WATER, M. AND TUNNEL CO.—Dec. 31. Location: Cerro Gordo Mining District, Inyo Co., Cal. Capital stock, \$1,000,000. Trustees—S. A. Raymond, J. M. Case, Stephen Bousney, Col. Deane and J. M. Williams.

TINTIC M. Co.—Dec. 31. Location: Tintic District, Juana Co., elsewhere in Utah Territory. Capital stock, \$3,000,000. Trustees—J. B. Wingard, T. P. Wingard, W. H. Baker, W. S. Thompson and John Mallon.

CINERELLA M. Co.—Dec. 31. Location: Inyo Co., Cal. Capital stock, \$5,000,000. Trustees—T. B. Wingard, J. P. Wingard, J. P. M. Perham, W. H. Blake and John Mallon.

MARIPOSA M. Co.—Dec. 31. Location: Mariposa Co., Cal. Capital stock, \$1,000,000. Trustees—A. C. Peachy, T. F. Cronise, D. F. Verdenal, E. B. Dorsey and W. H. Cronise.

ACCOMMODATION M. Co.—Dec. 31. Location: California, Nevada, Utah and Arizona. Capital stock, \$3,000,000. Trustees—C. P. Hall, G. A. B. Berry, C. B. Land, Col. Deane, George O. Treadwell.

DIAMOND-SPRING GRAVEL M. Co.—Dec. 31. Location: Placer Co., Cal. Capital stock, \$5,000,000. Trustees—A. A. Jennings, C. E. Macy, R. H. Rogers, C. W. Keeney and W. H. Barron.

HENRY CLAY M. Co.—Dec. 31. Location: Ely Mining District, Lincoln Co., Nevada. Capital stock, \$3,000,000. Trustees—J. F. Jones, J. A. Pritchard, Robert Shattuck and H. H. Turill.

HUBER M. Co.—Dec. 31. Chief District, Lincoln Co., Nevada. Capital stock, \$3,000,000. Trustees—Henry Raymond, A. H. Boyden, Samuel McMasters, S. B. Goodrich and James Wise.

SWADLEY M. Co.—Dec. 31. Location: Amador Co., Cal. Capital stock, \$300,000. Trustees—W. W. Swadley, H. B. Congdon, P. H. Blake, J. M. Nye and L. Fields.

SIXTY EIGHT M. Co.—Dec. 31. Location: Nevada Co., Cal. Capital stock, \$3,000,000. Trustees—Thomas Findley, Thomas Skce, Howard E. Eyre, A. M. Hays and Thomas Young.

S. F. COOPERATIVE LAND AND BUILDING ASSOCIATION. (Amended Capital). Object: To buy and sell real estate, to build dwellings and dispose of the same, to lend and borrow money, to accept and deposit money, Capital stock, \$200,000. Trustees—M. H. Turill, James L. King, J. L. Field, H. B. Congdon, P. H. Blake, J. W. Nye, James L. Horner, Charles D. Dunn and Charles J. Collins.

INCOME GOLD M. Co.—Dec. 31. Object: Purchase and development of mining property. Capital stock, \$2,000,000, in 100 shares. Trustees—Thomas Nelson, E. P. Hutchins, A. J. Adams, J. P. Nesmith, George P. Thurston.

TEXAS HILL BLUE GRAVEL M. Co.—Dec. 31. Location: California, Nevada, Utah, Arizona. Capital, \$3,000,000, in 100 shares. Trustees—Frederick MacCrellish, Thos. J. L. Smiley, P. M. Batchelder, B. P. Batchelder and George P. furie.

LOOKOUT G. AND S. M. Co.—Dec. 31. Location: San Joaquin Mining District, Linn county, Oregon. Capital, \$5,000,000, in 100 shares. Trustees—S. A. Raymond, H. B. Morse, J. M. Case, P. J. Lavin, J. A. Albertson.

VALPARAISO M. Co.—Dec. 31. Location: Amador county, California. Capital, \$300,000 in 10 shares. Trustees—T. F. Cronise, John A. Eagan, W. W. Swadley, P. H. Blake and H. B. Congdon.

SEVENTH M. Co.—Dec. 31. (No location.) Object: To purchase and develop mines. Capital, \$3,000,000, in 100 shares. Trustees—E. P. Hutchins, Col. Harry Linden, J. F. Nesmith, A. J. Adams and Geo. P. Thurston.

UTAH AND NEVADA M. Co.—Dec. 31. Location: Utah and Nevada. Capital, \$1,000,000, in 100 shares. Trustees—T. P. Smith, S. D. Megenth, P. Roberts, E. Hestres and B. Morgan.

YANCON COAL M. Co.—Dec. 31. Object: To mine and develop coal fields of California. Capital, \$2,000,000, in 100 shares. Trustees—George Dean, Joseph Wilson and A. Lebland.

ARCHIE M. Co.—Dec. 31. Location: Nevada, California and elsewhere. Capital, \$2,500,000, in 50 shares. Trustees—Geo. McDonald, W. H. Baker, W. S. Thompson, A. B. Paul and J. B. Houghton.

SAN SPRING G. AND S. M. Co.—Dec. 31. Location: El Dorado county, California. Capital, \$1,000,000, in shares of \$5. Trustees—C. J. Farran, C. F. Brown, John A. Mayer, H. C. Swain and John Lipt.

LONDON G. AND S. M. Co.—Dec. 31. Location: California and Nevada. Capital, \$3,000,000, in 100 shares. Trustees—S. L. Kreider, J. Clem Uhler, J. M. Lenzard, A. Pierce and F. L. Kreider.

LOVE STAR G. AND S. M. Co.—Dec. 31. Location: California, Nevada, Utah, Colorado, Arizona and Washington. Capital, \$3,000,000, in 100 shares. Trustees—S. D. Kreider, J. Clem Uhler, J. M. Lenzard, A. Pierce and F. L. Kreider.

ROSE CREEK M. Co.—Dec. 31. Location: Humboldt county, Nevada. Capital, \$3,000,000. Trustees—D. L. McDonald, T. J. Shackelford, A. Henne and P. E. Connor.

BURLINGTON G. AND S. M. Co.—Dec. 31. Location: In California, Nevada and Utah. Capital, \$3,000,000, in 100 shares. Trustees—L. D. Ingolsby, W. Borrowes and R. Aiken.

GEORGIA M. AND M. Co.—Dec. 31. Location: California, Nevada, Utah and Arizona. Capital, \$3,000,000, in 100 shares. Trustees—C. P. Hall, H. Raymond and H. Mayers.

NEW MEXICAN M. Co.—Dec. 31. Location: Storey county, Nevada. Capital, \$2,500,000, in 100 shares. Trustees—Jas. Daly, H. Ward and M. J. McManus.

HABATA M. Co.—Dec. 31. Location: California, Oregon and elsewhere. Capital, \$10,000,000, in 100 shares. Trustees—Chas. J. H. Warner, Geo. L. Goulet and E. V. Williams.

MONTREAL GRAVEL M. Co.—Dec. 31. Location: California. Capital, \$2,400,000, in 100 shares. Trustees—Col. Dean, G. Sleeper and George Sleeper.

HODGSON M. AND M. Co.—Dec. 31. Location: Secret Canon Mining District, Lander county, Nevada. Capital, \$3,000,000, in 100 shares. Trustees—H. A. Hodgdon, A. P. Hodgdon, J. M. Moon, E. J. Moore and H. B. Maybaw.

BLACK HAWK M. Co.—Dec. 31. Location: Tooele

county Utah. Capital, \$400,000, in 10 shares. Trustees—W. A. Schofield, W. W. Higgins, Wells L. Coo, Jesse Chubb and J. C. Bell.

GRANN TURK M. Co.—Dec. 31. Location: Storey county, Nevada. Capital, \$3,600,000, in 100 shares. Trustees—Jas. Daly, H. Ward and J. M. McManus.

ARIZONA DIAMOND DRILL AND M. Co.—Dec. 31. Location: Arizona and the Pacific Coast. Capital stock, \$11,000,000, in 100 shares. Trustees—Robert Battersby, John A. Robertson, J. K. Glasby, L. Ransom and W. H. Cummings.

MOUNT GREGORY W. AND M. Co.—Dec. 31. Objects: The securing and holding of water rights and water property, and the development of mines in California. Capital, \$1,000,000, in 100 shares. Trustees—John Daggett, Myron Angel and M. D. Fairchild.

SIXTY PETROLEUM CO.—Dec. 31. Location: California. Capital, \$500,000. Trustees—Joseph Brandenstein, M. Rosenbaum, Chas. Stott, John H. Beardsley and E. B. Mastick.

LOUISA PETROLEUM CO.—Dec. 31. Location: California. Capital, \$500,000. Trustees—S. D. Kreider, J. C. Uhler, J. M. Lenzard, S. J. Ferry and F. L. Kreider.

MOUNT PETROLEUM CO.—Dec. 31. Location: California. Capital, \$500,000. Trustees—S. D. Kreider, J. C. Uhler, J. M. Lenzard, S. J. Ferry and F. L. Kreider.

SANTA PAULA PETROLEUM CO.—Dec. 31. Location: California. Capital, \$500,000. Trustees—S. D. Kreider, J. C. Uhler, J. M. Lenzard, S. J. Ferry and F. L. Kreider.

PROPEL'S M. AND M. Co.—Dec. 31. Hogg's Mining District, El Dorado county California. Capital, \$2,000,000, in shares of \$100. Trustees—J. G. Severance, G. W. Paget, E. A. Rockwell.

GERMAN-AMERICAN COLONIZATION SOCIETY.—Dec. 31. Object: To encourage and assist immigration; to accumulate funds for the purchase of lands for the use of colonies, and for the improvement of the lands, and other purposes, and to cooperate with similar organizations in Europe and the United States. Capital, \$250,000, in 50 shares. Trustees—F. Roeding, Geo. H. Egges, P. Speckles, J. F. Helakun, P. Wolfinger, F. J. Horn, C. Kohler.

MOUNTAIN M. AND M. Co.—Dec. 31. Location: California, Nevada, Oregon and elsewhere. Capital, \$10,000,000 in 100 shares. Trustees—W. A. Darling, J. O. Boyce, F. Brodie, T. P. Beardsley and E. W. Hanson.

MAGNA CHARTA M. Co.—Dec. 31. Location: California, Nevada, Arizona and Utah. Capital, \$4,000,000 in 40 shares. Trustees—T. P. Ryan, H. Gleason, M. J. McManus.

TAMERHEAT G. AND S. Co.—Dec. 31. Location: California. Capital, \$10,000,000 in 100 shares. Trustees—H. S. Fitch, N. P. Smith, T. B. Fitch, W. G. Schofield, H. C. Kibbe.

BUNAVENTURA G. AND S. M. Co.—Dec. 31. Capital, \$10,000,000. Trustees—H. S. Fitch, N. P. Smith, Thaddeus Fitch, W. G. Schofield and H. C. Kibbe.

GOTUMA G. AND S. M. Co.—Capital, \$10,000,000. Trustees—H. S. Fitch, N. P. Smith, Thaddeus S. Fitch, W. G. Schofield and H. C. Kibbe.

ARGENTINE G. AND S. M. Co.—Capital, \$10,000,000. Trustees—M. J. McManus, W. H. Gleason and T. P. Ryan.

METROPOLITAN M. Co.—Dec. 31. Location: California, Nevada, Arizona and Utah. Capital, \$1,000,000, in 100 shares. Trustees—M. J. McManus, W. H. Gleason and T. P. Ryan.

NASHVILLE G. M. Co.—Dec. 31. Location: El Dorado, Big Canon Mining District, California. Capital, \$3,000,000, in 100 shares. Trustees—E. J. Baldwin, B. E. Canallin and J. P. Canallin.

REGENERATE FURNACE CO.—Dec. 31. Object: The erection of works to make steel by the patent processes and furnaces of T. J. Chubb and others. Capital, \$250,000, in 100 shares. Trustees—James Brodie, L. Ransom, R. Battersby, J. K. Glasby and James Kip.

VICTOR QUICKSILVER M. Co.—Dec. 30. Object: Mining for quicksilver. Capital, \$25,000. Trustees—James Brodie, L. Ransom, Robt. Battersby, J. K. Glasby and James Kip.

PACIFIC CEMENT CO.—Dec. 31. Object: Manufacture of cement, cement pipes, etc. Capital stock, \$250,000. Trustees—Theodore L. Schell, Horatio McPherson, Godfried Rousch, William E. Miller, Peter Wolfinger, Tracy L. Bibbins, Felix J. Hoia.

GREYHOUND G. AND S. M. Co.—Dec. 31. Location: Enterprise mining district, Amador county, California. Capital stock, \$1,000,000. Trustees—Edward Gallagher, James O'Neil and Edward Drum.

PACIFIC M. Co.—Dec. 31. Location: California, Nevada, Utah, Idaho, Colorado, Arizona and Washington. Capital stock, \$3,000,000, in 100 shares. Trustees—J. P. Rogers, James S. Reynolds, Martin Jones, L. J. Lewis and J. B. Townsend.

CONSOLIDATED HIDDEN TREASURE CO.—Dec. 31. Object: "To visit and explore certain islands in the Pacific Ocean for the purpose of obtaining treasure therefrom, and also to do a trading business between certain islands and ports in said Pacific Ocean." Capital stock, \$10,000,000, in 50,000 shares. Time of existence, 5 years. Trustees—M. R. Cheever, A. W. Fisk, W. W. Stillwagon and J. P. Nourse.

NEVADA AND UTAH M. Co.—Dec. 31. Location: Nevada and Utah. Capital stock, \$5,000,000, in 100 shares. Trustees—Thomas Nelson, John Wright, Andrew C. Marthison, Martin White and A. Doble.

ROBERTS G. AND S. M. Co.—Dec. 31. Location: Ely Mining District, Lincoln county, Nevada. Capital, \$4,000,000, in 100 shares. Trustees—J. P. Van DeMark, Joseph F. Atwill, John W. Bucklin, Alfred Mayers and Charles J. Collins.

MDAS M. Co.—Dec. 31. Capital stock, \$1,500,000, in 50 shares. Trustees—Samuel Dixon, P. J. White, R. P. Keating, R. E. Brewster and W. F. Leon.

ROY YUMA G. M. Co.—Dec. 31. Location: Agra District, El Dorado Co., Cal. Capital stock, \$2,000,000, in 100 shares. Trustees—C. P. William, M. M. Staples and G. Bishop.

PACIFIC M. M. AND MANE' G. Co.—Dec. 31. Object: To purchase and develop mining property, and lease and sell mills, furnaces and mining machines. Capital stock, \$1,000,000, in 100 shares. Trustees—H. W. Dean, J. F. Nesmith and George P. Thurston.

U. S. COAL AND TRANS. CO.—Dec. 31. Location: Nevada, California, Oregon or elsewhere. Capital stock, \$5,000,000, in 100 shares. Trustees—Wm. Burling, James W. Burling and Henry D. Bacon.

FRANKLIN M. Co.—Dec. 31. Location: Gold Hill District, Storey Co., Nevada. Capital stock, \$3,000,000, in 100 shares. Trustees—Geo. G. Waters, C. Jones, H. Fleischacker, E. Strother and Henry E. Green.

OCCIDENT M. Co.—Dec. 31. Location: Nevada and elsewhere. Capital stock, \$2,500,000, in 50 shares. Trustees—Wm. H. Baker, T. B. Wingard and W. S. Thompson.

PACIFIC DESSICCAT FRUIT CO.—Dec. 31. Object: To buy, sell and dry fruit by means of the Stevens' Dessiccating Process and sell the product at right. Capital stock, \$500,000, in 10 shares. Trustees—Henry E. Green, John W. Wissing, Henry S. Fitch, Geo. W. Stevens and George Bowen.

CALIFORNIA M. AND WATER CO.—Dec. 31. Object: Purchasing and selling mining property, water-rights, etc., and to mine. Capital stock, \$10,000,000, in 100 shares. Trustees—Thomas Bell, E. L. Sullivan, and S. F. Buttsworth.

VICTOR QUICKSILVER M. Co.—Dec. 31. Location: California, Nevada, Oregon, Utah and Arizona. Capital stock, \$3,000,000, in 100 shares. Trustees—Ernst Hahn, V. Fernbach, T. J. L. Smiley, M. C. Hillier, B. C. Vatties.

S. FRANCISCO IRON ORE REDUCTION CO.—Object: To erect works for the purpose of reducing iron ore and to develop mines. Capital stock, \$1,000,000, in 100 shares. Trustees—James Brodie, L. Ransom, R. Battersby, J. K. Glasby, James Kip.

SAN FRANCISCO ORE CONCENTRATING CO.—Dec. 31. Capital, \$1,000,000. Trustees—James Brodie, L. Ransom, R. Battersby, J. K. Glasby and James Kip.

ADELIA G. AND M. Co.—Dec. 31. Location: Agra M.

Dist., El Dorado County, California. Capital stock, \$3,000,000, in shares of \$100. Trustees—G. Bishop, W. W. Higgins and R. A. Hawkins.

NEPTUNE M. Co.—Dec. 31. Location: Kelsey M. Dist. El Dorado County, California. Capital, \$2,000,000, in 100 shares. Trustees—C. E. Elliot, H. O. Kibbe and Ira G. Hoitt.

NORTHERN PACIFIC COAL M. Co.—Dec 31. Location: Oregon and California. Capital, \$4,000,000, in 100 shares. Trustees—T. P. Beard, M. T. Smith, H. S. Brown, M. G. Kennedy and Jesse Holland.

LAND CONTRACT CO.—Object: To aid in establishing a system of leases and economical rental system, to ultimate in the purchase as well as in the practical tillage of lands, and for other specified purposes in connection with land. Capital, \$1,150,000, in 80 shares. Trustees—J. K. Glasby, W. H. Cummings, L. Ransom, David Butler and J. T. Bond.

HONNS G. M. Co.—Dec. 31. Location: Agra Mining District, El Dorado county, Cal. Capital, \$2,000,000, in 100 shares. Trustees—Isaac S. Allen, K. R. Swalu, W. W. Higgins, B. H. Freeman and G. Bishop.

CALIFORNIA FIRE EXTINGUISHING CO.—Dec 31. Object: Manufacture and sale of fire extinguishing apparatus. Capital, \$300,000, in 100 shares. Trustees—S. P. Christie, A. S. Stewart, J. P. Jackson, W. R. McCaw and W. H. Booth.

ROCKLAND M. Co.—Dec 31. Location: California, Nevada, Arizona and Utah. Capital, \$3,000,000, in 100 shares. Trustees—S. Heitsch, A. Staples, C. M. Peck, C. J. Eaton and Wm. Geary.

W. T. GARRATT & CO.
CITY
Brass and Bell Founder,
Corner Natoma and Fremont Streets,
MANUFACTURERS OF
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VOLUME XXVI.
Number 2.

About California's Gold-Bearing Rocks.

[Written for the Press, by AMOS BOWMAN.]

Charles Kingsley never said anything more truly than when he said geology is the Science of Common Sense. All who have the gift of common sense may read the book of out-doors. Any standard of exclusiveness in geological observation other than the possession of the noble gift of common sense, to follow where necessary from the known to the unknown is, whenever set up, a bar to the general progress, and to scientific progress a curse. It may even be a bar to merited material prosperity, and nothing less than a curse to a State.

The geography and approximate continuations of the world-famous auriferous slates of the Sierra Nevada of California should have been determined and become universal property in outline at least, a great many years ago.

Where annually since 1849, ten thousand men of superior intelligence—chiefly miners—have been making sections of exploration across them, and several thousands have travelled along their whole length and observed them in longitudinal profile, what cloud of darkness can it have been that prevented the light of the common intelligence from beaming forth in a common recognition of the facts?

I have no hesitation in presenting to the readers of the MINING PRESS in connection with the subject of our gold mining geology in brief as far as I can, what is known from the public Geological Surveys on the subject of the extent of the gold-bearing slates and accompanying rocks of California.

P. T. Tyson, in a report to the Secretary of War in 1849,* described the principal lithological characteristics and the physical relief of the Sierra Nevada's gold-vein bearing slope. Wm. P. Blake and others* in the Pacific Railroad reports dating down to 1862, and the members of the Geological Survey of California since 1860, besides various travelers and contributors to the United States records of the Bureau of Mining Statistics, and to the mining journals of the day have added to the general knowledge on the subject; a summary of which is given in the accompanying sketch, showing besides their relation to older rocks the geography of the slates, etc., as perfectly as delineated by the State Geological Survey, on one of Holt's large maps, colored by Prof. Whitney and exhibited at his request by the writer to the Governor and Legislature a year ago.

The unshaded white in the accompanying diagram represents the ocean bottom, of to-day, along shore; the lightest shading not cross-hatched, the palaeozoic shore bottom in the early or dark ages of geology; the lightest cross-hatched, the land, or the Pacific coast of that period.

Silurian, devonian and carboniferous fossils brought by Mr. Clayton and others, from Silver Peak and other points lithologically related in Nevada, have determined for us in general terms, the great fact as represented.

The intermediate one between the lightest and darkest shadings of the sketch, is the ones which concern us most. It represents in general the area of the auriferous slates. A portion of this shading, it will be observed, is done by lines sloping down towards the left; this represents the off shore or deep sea mud which washed down from the palaeozoic or ancient shore in the middle-age or Reptilian period of geology that next followed the Palaeozoic time, or age of fishes.

The area so shaded was dotted by islands

from which came the conglomerates we find interspersed here and there in the slates—or muds as they were.

Another portion of the same general tint, it will be observed is shaded by lines sloping down towards the right; this and the last mentioned having a close relationship to each other. This is the area of predominating granite which was once probably pretty generally

we should not find it difficult to hit upon the precise method of granitic uplift whereby the off-shore mud-strata became shaped into a dome of unparalleled sublimity, presenting to our view a base or section of 70 miles, and an altitude of 8,000 or 10,000 feet.

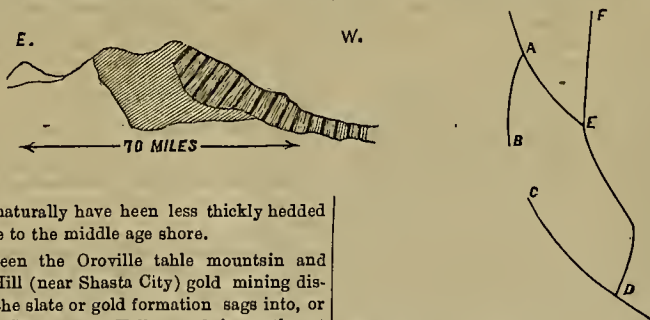
The relation of this mesozoic formation to the palaeozoic shore becomes obvious from the diagram. The granite island centers as they



DIAGRAM REPRESENTING THE GEOLOGY OF THE GOLD BEARING SLATES, viz: The Areas of the Palaeozoic (Ancient or Primary); the Mesozoic (Middle Ages or Secondary); the Cenozoic (Geologically Modern or Tertiary); and Present Shore Bottoms.

covered by slates—which were accordingly subjected to all the vicissitudes attending the uplift of a granite mountain core, that of the Sierra Nevada; showing only spots of slates, as represented. The slates are mostly gone; they

were then in the axis of the Sierra Nevada, before the uplift of these beds, had the same relation to the Pacific shore of the period that the granite Farallone islands have to the Pacific shore of to-day.



would naturally have been less thickly hedged so close to the middle age shore.

Between the Oroville table mountain and Piety Hill (near Shasta City) gold mining districts, the slate or gold formation sags into, or crosses, Sacramento Valley, and is partly cut off, partly only exposed by the deep erosions of the upper Sacramento; being covered at the surface throughout this fifty miles of distance by a broad sheet of lava from Lassen and Shasta peaks, the tabular cliffs of which as plainly seen from the railroad, designate the shore line where these lavas broke into the Pliocene sea.

That the slate forming muds were deposited in pretty deep water throughout a long period of time, we have good reason to believe, from their consistency, and from their vast thickness. No careful geological measurement of the thickness in feet has ever been attempted with satisfactory results. Yet it would seem that in the extreme simplicity of the regularity of the hedding of the slates as here indicated along the entire western slope of the range,

It will be observed that the axes or efforts of uplift developed a form like this. A valley was formed opening northward like Eel and Salinas rivers, as if intended to connect with the Klamath (see the striking identity of axis) and drain into the ocean at its mouth. But the Siskiyou mountains near Weaverville developed a split or spur more to seaward,—in sympathy with the Monterey and San Francisco granitic arms from the Tejon; thus laying the foundation for the future topography of the great California valley, a valley of depression.

The extensive (scarcely explored) volcanic plateau of Shasta and Lassen peaks extending to Goose Lake, (the Modoc's country) represented by the letters A E F, owes its origin primarily, perhaps, to the manner in which these forces of uplift affected that inter-montane

area. Ages later, in the Tertiary when the Pliocene rivers were scooping out their treasure chests for the hydraulic miners that are now at work in them, and when the great valley of California was not yet dry land, there were further changes of level, interesting to consider in connection with this plateau—the history of which, as read in the Pliocene gravels, is only the later history of the auriferous slates. Belonging to surface geology, however, I will not follow in this connection, the story of the slates any further.

It will be next in order to consider the auriferous contents of the Slates: the veins gashes, chimneys, nests, gutters and beds, etc., in which gold has located itself, in association, in each case, with certain families of minerals; which are perfectly recognizable, and peculiar to the districts from which they come.

*To be found in the State and Mercantile Libraries.

Seattle Coal.

A new vein of coal has lately been discovered on Cedar River, which empties into Washington Lake near Puget Sound. The vein is from nine to ten feet in width wherever it has been opened or crops out. The parties owning the ledge have a charter for a narrow-gauge railroad to Seattle, 16 miles distant, and propose to open the mine systematically as soon as they are able. Seattle coal is in demand in this city and retails at about \$16 or \$17 per ton. These parties think they can sell it here at \$5 per ton. Coal ought really to be sold here at not more than two or three dollars per ton more than it is in the East, which would greatly benefit our manufacturing interests.

This vein of which we speak is about six or eight miles from the Seattle Coal Company's mine and in the same coal field. It crops out 80 feet above the Creek near by, and also crops out on a level with the creek. Other coal croppings have been found in the vicinity but this is the largest and most important as far as known. We are glad to know that efforts are being made to furnish coal to this city at lower rates than at present charged. We know of nothing which would benefit us more, and hope that capitalists will turn their attention to the mining of this most essential article, which will not only be very profitable to themselves but will help build up the industrial and manufacturing interests of the city.

A NEW DISCOVERY OF MARBLE.—A correspondent writes us from Camptonville that Messrs. Peter Butts and James Dimond, of that place, have discovered and located a very fine ledge of marble. The ledge is said to be large and well-defined, and some very fine samples have been brought into town for exhibition. The marble is nearly white and susceptible of receiving a very fine polish, and will probably be found pure white as the ledge is opened deeper.

There appears to be a heavy ledge of marble running through the country, for thirty miles or more in length, crossing the Feather River, below Strawberry Valley and the Yuba, above Emery's old crossing.

COAL MINERS' STRIKE.—As was expected a few weeks since, about 70,000 men have "struck" in the coal mining districts of Wales, for an increase of wages. Many of the mines have suspended operations. Coal is at famine prices, and the effect is being disastrously felt all over England.

AGASSIZ INSTITUTE.—Prof. Gilman has consented to lecture before this Association, in Sacramento.

CORRESPONDENCE.

Quartz and Gravel Mines in El Dorado County.

[Written for the Press.]

After an almost unprecedented cold snap, causing a suspension of mining—where any considerable quantity of water was required—by the freezing up of canals, ditches and streams of water, the weather has moderated and at this time—Dec. 25th,—we are having a fine warm rain, and the indications are that the storm will continue for several days. The cold dry fall has given the miners a fine opportunity to prospect, both quartz and gravel mines. El Dorado county is certainly taking a step forward in prospecting and working her quartz veins successfully. The

St. Lawrence Mine and Mill

Situated in Kelsey Township, north side of the South Fork of the American river, is a most excellent mine and mill, and they are running full time on from \$20 to \$40 rock. The main shaft is down about four hundred feet, and the ledge has been widening for the last two hundred feet, and is now some six feet in width. I am told that the gross receipts are about \$1,200 per each 24 hours. Col. D. E. Buel and Ike Bateman are the reputed owners of five-sixths, and—McNevens the Superintendent of the works, one-sixth of this valuable property.

The Isabel Mine and Mill

Situated northwest, and about half a mile from the St. Lawrence is claimed to be valuable; the vein being over four feet in width at a depth of 50 feet. Rock from this vein that has been milled, has paid \$39 per ton. The ledge has been traced two thousand feet. The Isabel is an incorporated company of which C. W. Brewster of this city is one of the principal owners.

The Dolly Varden Mine

Situated in the vicinity of those mentioned above, was discovered by McKinstry & Co., last summer and sold to Bennett & Co. of Sutter Creek, for a few thousand dollars, is now held at high figure and probably could be sold for as many thousands, as Bennett & Co. gave hundreds for it. There is no doubt of its permanency, as it has been prospected to the depth of 130 feet.

The Gopher Mine

Is situated in Kelsey Township not far from those spoken of, and is owned by citizens of Coloma and Napa. It has been sufficiently tested to warrant the belief that it is a valuable mine, but I am informed that the manner of prospecting has been to follow the vein on the surface rather than drive a shaft into the ground. Rock that has been taken from this vein and milled has yielded \$30 per ton. No richer placer mines have been found in the State than those known as Rich and Irish flats, in the immediate vicinity of the quartz mines I have spoken of. From my own knowledge, immense quantities of gold were taken from Rich and Irish flats, and Irish Creek, in Kelsey Township during the years 1851-2-3-4-5.

A San Francisco and New York Co.

Own some three thousand feet, commencing near the South Fork of the American river and extending north towards the St. Lawrence, but nothing has been done of late by this company on the vein. There are several other locations of quartz leads in this vicinity which I may notice hereafter, if subsequent developments warrant me in so doing.

The Cedarberg Mine,

In Greenwood township, I am informed, continues to be a paying institution. I am also informed that Ex-Senator Hunter, Mr. Sempers and their associates have struck the old porphyry or decomposed quartz lead, from which enormous quantities of gold were taken in 1851-'2 and '3; and an occasional strike has been made since that time. This claim is west of the Cedarberg, in Spanish Dry-Diggings district. Many thousands are reported to have been taken out of this claim by its present owners, within the last few months. There are a number of valuable quartz mines in Georgetown township—of their doings and prospects I am not posted. Senator McKusie has a fine ledge at Volcanville, six miles from Georgetown, which prospects remarkably well. He has about a thousand tons of quartz at the dump, ready to mill; but a scarcity of water, during the summer, has prevented mill-work.

Quartz in Mud Springs Township

Is receiving considerable attention, and business of all kind feels the influence of large and profitable mining operations there. Several large amounts of gold have been taken from porphyry claims in that township during the past summer and fall.

Quartz and Other Mines within a Radius of three miles of the Court House in this City.

Within one thousand feet of the main street of this city, Shephard & Whitten have located and are now prospecting a quartz ledge. It was discovered in a ravine below the County Hospital, and traced south over the hill in the rear of the Episcopal Church to Hangtown Creek. The locators sunk a shaft at the creek

twenty-five feet deep, and have now commenced a tunnel, following the vein, which is over five feet in width, and carries gold more or less in all the rock, although the hanging or under sides of the ledge is the richest. Not a pound of rock when pulverized and washed but shows more or less gold. The claim is considered valuable.

The Gross Mine,

Which was discovered last summer on Poverty Point, about one and a half miles north of the Court House in this city, from present indications is a remarkable rich mine. The vein is some four feet in thickness and is well defined, a tunnel having been driven in from one of the gulches that put down from the point, several hundred feet, being some three hundred feet below where the ledge crops out at the top of the hill. About four tons of the rock was taken to the Oregon Hill mill, and crushed last week, which yielded one hundred and fifteen dollars per ton. Gross has a hundred tons or more of rock which he intends to have crushed. The rock has to be packed to the top of the hill on mules, and then dumped into wagons and carted to the mill, two miles from the mine. I saw the gold which was taken from the rock crushed at C. W. Brewsters. I have been told that \$40,000 currency has been offered for this mine, by a New York Company.

True & Son have a vein south of the Gross lead, which I am informed has been bonded to some San Francisco gentlemen, for a pretty round sum. The

Oregon Hill, Mine and Mill

Has passed into the hands of Blair, Brewster and Lemon. Active operations have been resumed, and new developments thus far indicate a good mine.

The Excelsior Mining Claim,

Situated at Coon Hollow Hill, is probably one of the best hydraulic claims in the State. It has paid large dividends for the past two years—although knowing the amount, I am not at liberty to make it public—with only a limited supply of water. Two thousand inches of water could be used at much greater advantage proportionately, than two or three hundred.

Ames & Co.

Near the Excelsior claim have a hydraulic claim; they also have a ten-stamp water power mill, for crushing cement and gravel taken from the same claim. Their mill has yielded well since it was put in operation last fall.

Dickeroff & Goodyear's Gravel Mill

Has now been in operation some three years. Water for operating mill, and to use in batteries costs them 30 cents per hour, ten stamps of 450 lb each; capacity of mill is from 60 to 70 tons of gravel in 24 hours. The gross product of this mill had been from \$500 to \$1,800 per week since it commenced running, of which—I am informed—more than one-half is clear profit. Blacklock & Co.'s claim on Spanish Hill, has been paying well; also the Hook & Ladder claim, adjoining Blacklock & Co.'s claim owned by John and James Blair. About one year ago a large quantity of powder was exploded under the hill, shaking up the ground 160 feet in depth. They inform me that a like operation will be performed the coming spring. This claim has paid large dividends to its owners. Robinson & Co.'s mill, at Prospect Flat—steam power—has been in operation most of the time for the past three years, crushing gravel obtained near the mill, some 100 feet beneath the surface. A new shaft was lately sunk and a lead of gravel struck which is estimated to be worth, at least, \$40,000 to the owners.

The Granite Claim,

At Smith's Flat, owned by a San Francisco Co., of which I. I. Holmes is managing agent, is known to be a valuable claim, and great profits are expected from it, when it is properly drained and in working condition.

The Deep Channel Claim

Adjoining the Granite, owned by Creighton & Co. is also a valuable claim and has for a number of years paid large dividends. Creighton & Co. have a water power mill, eight stamps, for crushing the gravel that does not yield readily to hydraulic washing. Jess & Co., Crumson & Co. and several others have claims on Smith's Flat of which I have no time to make suitable mention. Hancock & Solter on Reservoir Hill have a valuable hydraulic mine, which is worked winters only. Ward Brothers have a remarkable rich streak of gravel at White Rock Cañon; they have a small water power stamp mill—five stamps. The gravel yields from \$20 to \$40 to the car load. This claim has made fortunes for four or five brothers, two of whom have gone to their former homes in the Eastern States and settled.

A Bedrock Flume in the Creek, or a Tunnel Through the Hill.

Last spring the City Council granted to Thomas Alderson—one of the owners of the South Fork Canal—a franchise of putting a bedrock flume in Hangtown creek through the city. Estimated cost of flume between \$40,000 and \$50,000. This work if completed would be a profitable investment, providing there was sufficient room for dumpage at the outlet of the flume. When it is considered that in a few years—if our supply of water is increased, which it must be within two years—that nine miles of hill, in some places three hundred feet high, is to be washed down and run through this flume—if it is built—it will readily be discovered that there is not sufficient room in Hangtown creek below the city to deposit the

debris thus sent through the flume from the working of the mines above.

To obviate the depositing of the enormous amount of earth and stone, to be washed down from the hills into the creek, and thus overflow the city,

Robert Patten, Engineer

Of the South Fork Canal, has conceived the plan of an outlet into Weher creek, by means of a tunnel some 3,000 feet in length through Hangtown Ridge, commencing at or near the Excelsior mining claim. This would give a dumpage of more than one hundred feet fall and all the bed of Weher creek for five miles as a receptacle for all the debris from the hill and claim above; besides, the heavy rains of winter swell this creek frequently to the size of a river, which would annually wash away such deposits as would have accumulated during the other seasons. Again, such a tunnel would drain all the claims along this ridge spoken of above—and some twenty not mentioned—but more particularly the Pacific quartz mine, Deckeroff and Goyan, Cedar, Prospect and Smith's Flats, which would be of incalculable value to the owners. The estimated cost of such a tunnel, all complete, ready for use, is \$60,000. The yield of gold from claims that would use this outlet, would not be less than a million of dollars per annum, might be two or three times that sum. A plat has been drawn of the tunnel, the line of the present canal, which runs along the ridge, the claims that would be benefited by it, and submitted to the officers of the South Fork Canal Company. Several others have been made by persons interested in mining on this ridge, to procure the necessary funds to construct the tunnel, but none have been accepted. E. N. SMOOT.

Placerville, Dec. 25, 1872.

Tintic District, Utah.

EDS. PRESS:—Owing to unforeseen circumstances I have been unable to fulfill my promise of a few weeks ago, until the present time. As mentioned in my previous letter "Diamond City," one of the mining camps of this district, is well worthy of note, from the excellency of its mines, and will at no distant day, rank with any of its sister cities in Tintic. It would take up too much space were I to enumerate the different leads separately, and therefore, will only give you a brief sketch of a few of the most prominent ones.

The Undine is a fine, rich lead owned by the Jackson brothers. No large amount of development has yet taken place. A shaft has been sunk down some 60 feet, following the ledge all the way, and a considerable amount of first-class pay ore taken from it. The lead is well defined and the ore paid well from the surface. Another shaft is about being sunk and from present indications, will prove very profitable.

The Joe Bowers, a claim owned by the Wendigo Company, of Lake Superior, is looking well; three shafts have been sunk to a depth of 100 feet. Very little work has been done upon this mine the past fall, but they are now preparing to proceed vigorously with the work of its development. Assays from the ledge show from \$25 to \$500 ore.

From the Jefferson a considerable amount of silver bearing quartz has been taken, and the prospects are flattering for a further increase. This lead is at present idle. The owners are, however, making preparations for the resumption of work at an early date. They have a shaft down upon the ledge 100 feet.

The Washington has a shaft 140 feet in depth with several drifts opened, and furnishing large quantities of milling ore which is accumulating upon the dump and ready for reduction as soon as the mill, now being erected, is ready to start. The vein is about four feet in width, encased in granite walls. All of the above mentioned mines are in granite formation.

The Morning Glory is a promising mine, ranking second to none in this district. It is located about three miles southerly from this place. The claim extends 3,000 feet in length, on a well defined vein of silver-bearing rock of free milling ore. It also carries some little copper.

The mine is thus far opened by two shafts, being respectively 78 and 120 feet deep. Two drifts have been run on the vein for from 15 to 20 feet each, and from which large quantities of ore have been extracted and forwarded to mills in East Cañon for reduction.

The shafts are distant from each other about 300 feet. When commencing to sink, the vein was three feet in width, with two regular firm walls, proving itself to be a true fissure vein. At a depth of 25 feet the vein enlarged to such an extent that the shaft was sunk in nothing but one mass of ore, and its present depth, 110 feet, the width of the vein is still unknown.

The character of the ore is a yellow and brown chloride, intermixed with a dark decomposed quartz, which, for mill reduction is very desirable, it being a free milling ore.

The ore taken from this mine has been shipped a distance of 40 miles to East Cañon for reduction, yielding from \$80 to \$135 per ton. A large quantity of second class ore is now piled up upon the ground, waiting for reduction by one of our new local mills; this class of ore will yield about \$44 per ton.

The bearing of this lode or vein is north and south, dipping west about 18 inches in 6 feet.

The vein is imbedded in granite formation. It is easy of access, and a desirable property for its owners. Work has been but slowly prosecuted upon the mine, owing to the inability of its owners to procure the necessary improvements required to work such a mine successfully. C. F. J.

Silver City, Utah, Dec. 1872.

The Seattle Coal Mines.

The coal deposits of Washington Territory are known to be very extensive, but for want of capital only those at Bellingham Bay have been mined to any great extent, but within the past three years the Seattle Coal Mines have been opened, and the production is rapidly increasing. The following extracts from a private letter written to us by a valued and reliable contributor at Seattle, Washington Territory, give some interesting information regarding the mines:

"The Seattle Coal Company is a stock company organized under the laws of California; office at San Francisco. The mine is located seventeen miles from Seattle, and four miles is railroad (narrow gauge); balance of distance is by water over lakes Union and Washington. They are taking out an average of 80 tons per day; employ about 120 men, two steam tugs, two large barges, one steam engine, 40 horses and 160 two-ton cars. The coal is conveyed from the mine to vessels at the port without change of cars. Last year they mined 15,000 tons, 10,000 of which was shipped to San Francisco. This year they have taken out 35,000 tons, and 25,000 tons shipped to San Francisco. Is now worth there \$12.50 per ton. The expenses are as follows: \$3.50 per ton to mine it and put it in ships at Seattle; \$5 per ton for freight, leaving a net profit of \$4 per ton, or 30 per cent. Mr. Charles J. Shatwick is Superintendent, and resides here, the other owners of the stock live in San Francisco and New York. The demand for coal is said to be steadily increasing. The mines are very large, in fact the different mines on this Sound now known would supply the United States for fifty years. It is a second Pennsylvania for coal and iron, but it requires capital to work them. This company have not capital sufficient to run it as it should be. If they owned their own ships they could save or make for themselves 40 per cent. more by proper outfit then coal could be placed in ships at \$2 per ton."—*Commercial Reporter, Oregon.*

The Champion Numismatist.

It may not be generally known that Dr. Charles Spier of this place is the oldest living and most successful numismatist in the world. He has been engaged in the collection of coins for over fifty-seven years and has now over 14,000 pieces, representing every species of coin ever produced in any year or under the dominion of any sovereign or Government from the days of Semiramis and the Pharaohs down to the present time. His collection is worth hundreds of thousands of dollars. He has over 10,000 of his pieces in the vaults of the Bank of California, and 4,000 or over here. At the Bank of California his collection is pronounced the best and most valuable in existence, not excepting those of Queen Victoria and the Sultan of Turkey, which are particularly extensive and valuable. A few days ago we examined the 4,000 of his pieces which he keeps here. They proved a most interesting study. Coins of the ancient Jewish Kingdom, of the various kings, consuls and emperors of Rome, Tyre, Sidon, Carthage, Nineveh, Babylon, China, Palmyra, Egypt, Japan, etc., with specimens of every year's coinage in all Christian lands from the time of Constantine till now, were exhibited in prodigious profusion. The Doctor has many coins which would sell for many thousands of dollars each. His collection has been the work of a very extended lifetime. He has traveled nearly all over the world and is constantly receiving new additions to his pieces from Europe and the East. He has gold and silver coins from the size of a very large teacup down to that of a pea. We wish we had the space to particularly describe them. The Doctor, who is in easy circumstances and greatly advanced in years, though still robust for one of his age, remains in Visalia on account of the excellency of the climate. His collection is very interesting to any one appreciating the mementoes of antiquity.—*Visalia Delta.*

UTILIZING ABALONA SHELLS.—Sixteen tons of abalona shells have been ordered from this coast by two firms, one in Boston and the other in Philadelphia. They are used for manufacturing into buttons and many kinds of fancy articles and bring good prices. The islands opposite to this county are literally covered with the finest shells for this purpose found in the world. Why are they not utilized? On the shores of Anacapa or Santa Cruz, a few men could soon load a schooner.—*Ventura Signal.*

SCIENTIFIC PROGRESS.

Electricity.

We are seemingly but little nearer a true solution of the nature of electricity now, than Franklin was a hundred years ago. Modern physicists have pretty generally concluded that it is only another form of motion, but this is only shifting the difficulty one step farther back; for who can define motion, or rather force, of which motion is the visible manifestation? Although we cannot define its nature, we are able to understand it far more fully, and to measure its effects and control its manifestations more successfully, than was thought to be possible at that earlier day. So many new terms have been introduced into this department of scientific research within a few years, that we think it may be of interest to our readers to define a few of these. The non-professional reader is sorely puzzled when he meets with such uncouth words as *volt*, *ohm*, and *farad*, or sees mention of primary and secondary currents.

The *primary* current is the current flowing directly from one element of a galvanic battery to the other.

The *secondary*, or *induced* current, is the current of electricity that is induced in a coil of insulated wire, when a magnet is suddenly introduced into its interior. It is also produced by revolving the armatures of electro-magnetic machines, by the Ruhmkorff coil, and in many other ways. Faraday was the first to study it.

Dynamic electricity is that produced by the galvanic battery, as manifested by the primary current. *Static* electricity is that produced by friction, and by the induced current in the Ruhmkorff coil. The two differ mainly in tension. By tension is understood the power of overcoming obstacles. Thus, static electricity will pass through the air for considerable distances, as is seen in the discharge of a Leyden jar, or a stroke of lightning. But dynamic electricity is rarely produced of sufficiently high tension to pass through greater thickness of air than a fraction of an inch. The quantity of electricity that is concentrated into a single instantaneous flash in lightning is spread out over hours in the battery, and is consequently weakened in intensity, though the quantity remains the same.

A simple illustration may serve to make the difference more readily understood. If a ball of lead weighing ten pounds were dropped upon a man's head from a height of sixteen feet, it would most likely injure him seriously. If, however, the ball of lead were converted into shot of a grain weight each, and these were allowed to fall in a continuous stream until the whole ten pounds had fallen, they would be scarcely noticed.

The standard of the resistance of bodies to the passage of electricity is called an *ohm*, from the name of the man who investigated the influence of resistances on electric currents. One ohm is equal to the resistance of 48.61 metres of pure copper or silver wire one millimetre in diameter, at the temperature of 65° F. When, therefore, a resistance of a thousand ohms is spoken of, we understand that a certain circuit opposes a resistance a thousand times as great as this to the flow of the current.

The *volt* is the unit of tension, and is so called from Volta. It is about equal to the electromotive force produced by one Daniell's cell. Thus, two Daniell's cells coupled for intensity would have an electromotive force equal to two volts. A Bunsen cell has an electromotive force equal to about 1.8 volts.

A *farad*, so named from Faraday, who investigated the relations of electrical quantity, is the unit of current.

The question is often asked, How can a telegraph operator, sitting in his office, tell within a few feet where a break in the wire is, or rather where it makes a connection with the ground? The operator knows the resistance of his wire per mile. Suppose, for instance, that it is fifty ohms. Now in the first place, he connects his battery with the wire, and also puts into the circuit a rheostat and a galvanometer. A rheostat is an instrument so constructed that a greater or smaller amount of wire or resistance can be readily introduced into or removed from the circuit. Having adjusted the rheostat so that the needle of the galvanometer points to a certain division, the wire is removed from the circuit, connection being made directly with the rheostat and galvanometer, instead of through the line and the earth. Suppose it is now found that more resistance must be introduced into the rheostat, in order to bring the needle to the same place; for instance, we have to introduce 500 ohms. The break must then be ten miles away; for the resistance of the earth is zero, and the additional resistance introduced must just equal that of the wire removed. In practice, the apparatus employed is a little more complicated than this, but the principle is the same.—*Boston Journal of Chemistry*.

RED LEAD GLASS UNFIT FOR INSULATION.—Prof. Henry Morton, in a recent lecture before the N. Y. Polytechnic Institute said that red lead, although one of the best of non-conductors, will render glass a very good conductor, if it enters into its composition. Such glass, which is usually of high refracting power, and therefore brilliant in appearance, is utterly unfit for purposes of insulation. This fact is of much importance to such as have to do with the construction of electrical apparatus.

THE SPECTROSCOPE.—A correspondent of the *Scientific American* says that notwithstanding the spectroscopic is regarded by scientists as the most wonderful instrument of the age, and is doing more than all other instrumentalities to-day for the advancement of astronomical science, it does not tell the same story to all observers. The same light does not prove to be composed of the same substances when different men and instruments are employed. For example, to Prof. Young the corona seen during the eclipse of the sun is a permanent aurora, and deemed by him electrical in character; to Prof. Harkness the instrument suggests that the appearance is not in the nature of an electrical discharge, and its light not polarized, but that this mystical aureole of the source of light is incandescent hydrogen gas with vapor of iron. I could name many operators with various results.

RAINDROPS AND RAINBOWS.—According to Kolbe, the size of the drops in a rainstorm essentially modify the character of the rainbow that may be formed. He shows this by a quivering apparatus, which produces three kinds of drops simultaneously: the first, large and easily recognized as drops; the second, small, and whirling at first among each other, then falling in parallel directions to the ground; the third, very fine, and forming thin clouds of spray, which rise in the air. In the last no trace of a rainbow can be observed, even in a darkened chamber into which a ray is admitted; the second kind gives a bow (blue and orange), distinctly visible, at a distance of three feet, but more distinct where the drops fall parallel than where they whirl together; the large drops give a bow with much livelier hues.

COPPER IN COCOA AND CHOCOLATE.—M. E. Duclaux, who recently ascertained the existence of a small quantity of copper in cocoa and chocolate, gives as the best method to determine its presence, the precipitation of the metal in a platinum capsule by the action of tin. If a series of determinations are made the capsules increase in weight. The variation of a capsule of 15 gms. may exceed 3 milligrams. In one experiment he detached a grayish-black substance weighing 30 milligrams, which he recognized to be spongy platinum, produced by the occlusion of hydrogen. The barks of cocoa were found to contain as much as 0.025 per cent. of copper. Less quantities were found in the kernel.

SELF-PURIFICATION OF FLOWING WATER.—Concerning the rapidity with which contaminations are got rid of by flowing water, Dr. Letheby asserts that sewage impurities will entirely disappear in a flow of a dozen miles. If, he says, ordinary sewage, containing say one hundred grains of solid matter to the gallon, of which solid matter probably something like fourteen or fifteen grains will be organic, be mixed with twenty times its bulk of ordinary river water, it will not contain, after a flow of ten or twelve miles, a particle of that sewage discoverable by any chemical process. Dr. Parkes also believes that flowing water thus purifies itself, but he does not undertake to say how far it must run to make the process of purification complete.

TENDENCY TO CRYSTALLIZE.—There has been noticed a singular tendency in old silver ornaments and coins to become crystalline and friable. An ancient fibula was found in the island of Cyprus, and supposed to be at least 1500 years old, which, through the greater portion of its substance, presents a fracture something like that of cast iron, and its specific gravity has been reduced in round numbers from ten to nine. It contains a little copper. This property of certain metals or their alloys to change in condition and volume is worthy the attention of those whose duty it is to make our standards. Experiments should be instituted for the purpose of learning what metals or combinations of metals are least subject to this change.

SELF-PURIFICATION OF FLOWING WATER.—Concerning the rapidity with which contaminations are got rid of by flowing water, Dr. Letheby asserts that sewage impurities will entirely disappear in a flow of a dozen miles. If, he says, ordinary sewage, containing say one hundred grains of solid matter to the gallon, of which solid matter probably something like fourteen or fifteen grains will be organic, be mixed with twenty times its bulk of ordinary river water, it will not contain, after a flow of ten or twelve miles, a particle of that sewage discoverable by any chemical process. Dr. Parkes also believes that flowing water thus purifies itself, but he does not undertake to say how far it must run to make the process of purification complete.

ORGANISMS IN CRYSTALLINE ROCKS.—Dr. Jenzsch, of Gotha, who has devoted himself for some years to microscopic lithology, announces that in various kinds of crystalline and volcanic rocks he has discovered minute animal forms in prodigious numbers in a fossil condition. Among them he finds infusoria and rotifers intermingled with algae, and he infers their formation in a large expanse of stagnant water.

SPECTRUM OF THE AURORA.—Vogel has determined that the spectrum of the aurora may with great probability be regarded as a modification of the air spectrum, the variability of the spectra of gases under different circumstances of temperature and pressure being well established.

MECHANICAL PROGRESS.

The Laws of Combustion in Steam Furnaces.—How to Render Combustion as Complete as Possible.

The *Engineer* condenses from the *Journal of the Royal United Service Institution* the following very interesting paper by M. T. S. Prideaux, who has for many years labored energetically to secure efficient combustion in steam-boiler furnaces. The subject is one of much importance to every one who employs steam-power. Mr. Prideaux, after a few general remarks, proceeds substantially as follows, as we copy from the *Engineer*:

When a pound of carbon is completely burned it liberates 14,500 units of heat. In other words, 1 lb. of carbon so burned liberates heat enough to convert 15 lb. of water into steam. In practice it is quite impossible to burn the 80 per cent. or so of carbon which coal contains at one operation. When the furnace is charged with fresh cold fuel it will not burst into flame all at once—on the contrary, it undergoes a species of distillation. Ordinary coal may be regarded as containing 80 per cent. of carbon and 5 or 6 per cent. of hydrogen in chemical combination with the carbon, and at low temperatures—less than 800 deg.—the hydrogen escapes in combination with carbon as carburetted hydrogen; but hydrogen at a high temperature unites with eight times its weight of oxygen; the result is, that the combustion of 1 lb. of hydrogen liberates about 60,000 heat units, or four times as much as a pound of carbon. Unless eight pounds at least of oxygen are supplied to each pound of hydrogen, the carburetted hydrogen gas does not burn at all, however high the temperature, but flies up the chimney with a resulting waste equal to about 15 per cent. of the whole fuel.

Turning now to the carbon, we find that, if enough oxygen be supplied, that is to say, 2½ lbs., or 12 lbs. of air per pound of carbon, and if the temperature be sufficiently high, we have complete combustion, the resulting product of combustion being 3½ lb. of carbonic acid. But this perfect combination can never be secured at once. A portion of carbon next the fire-bars unites at once with the required quantity of oxygen, and the resulting carbonic acid, in ascending through the green fuel above it, dissolves carbon; 3½ lbs. of carbonic acid resulting from the complete combustion of each pound of carbon next the grate-bars dissolves another pound of carbon, and becomes converted into carbonic oxide, sacrificing, in doing so, 5,700 units of heat. Each pound of carbonic oxide then represents 14,500 units of heat due to the pound of carbon dissolved, and 5,700 units of heat absorbed in effecting the solution, or 20,200 units of heat in all. To recover this we must supply each pound of carbonic oxide with 2½ lbs. of oxygen when it burns with a blue flame and gives out all its heat.

It will be seen from this that by wasting the carburetted hydrogen and the carbonic oxide we can sacrifice, in round numbers, about two-thirds of all the heat generated. In practice few furnaces are so badly constructed that this result always takes place; but it is also true that under ordinary conditions most furnaces send a great deal of carburetted hydrogen and carbonic oxide up the chimney. The remedy is, of course, to supply sufficient air; but from the very nature of the case it appears to be impossible to do this through the bars. The larger the supply through them, the larger will be the quantity of carbonic acid produced per minute, and the greater the quantity of carbon dissolved and carried off as carbonic oxide. Air must be admitted above the fire as well as through the bars, in order that a sufficient quantity of free oxygen may be supplied to combine with the carbonic oxide and reduce it to carbonic acid. The late Mr. C. Wye Williams, and many others with him, held that it was proper to admit air continuously above the bars to secure complete combustion. In a certain sense Mr. Williams was right, but practically he was wrong; and although complete combustion may be effected with perforated doors, it is well known to every engineer that as a result of the free admission of air over the fire, the steaming powers of a boiler are reduced although the economic efficiency of the fuel is to some extent increased.

The reason is this: The air admitted carries off heat, which ought to go to the water, the temperature in the furnace and flues is reduced, and it is, indeed, quite possible to admit air enough to defeat the object in view, because the temperature of the gases may be so lowered thereby that they will not burn. The great demand for air above the bars occurs just after firing. In the first place, because it is only during the few minutes after firing that carburetted hydrogen is produced; and in the second place, because just then the influx of air through the bars is reduced to a minimum in consequence of the increased thickness of the bed of fuel through which it has to force its way. After the fire has burned clear we are done with hydrogen, and as the fire thins, efficient air will find its way through the bars to secure the combustion of most of the carbonic oxide. Under the best

circumstances it is probable, however, that a considerable portion of this gas escapes unburned; but it is better to submit to this loss than to incur the far greater evil caused by admitting air freely at all times above the bars.

In all that we have just written we have expressed opinions with which Mr. Prideaux coincides, although we have placed the statement of facts in a different form from that adopted by him. We have now to explain how Mr. Prideaux applies his knowledge in practice. It is well known that a great number of inventors have devised schemes for admitting air above the burning fuel for a limited period, varying, say, between one and five minutes after firing. The great difficulty to be contended with is the inherent roughness of the conditions under which stoking is effected. It will not do to leave the regulation of the air admission to the stoker, as has been abundantly proved in practice; nor can any delicate combination of automatic mechanism be trusted to remain in order for any time in the dust and heat of a stovehole.

For about twenty years Mr. Prideaux has labored to produce some device which will get over these difficulties, and we think we can say, after a personal and careful examination of his apparatus, that he has been in the main successful. A portion of his paper in the *Journal of the Royal United Service Institution* is devoted to a description of his apparatus, which may be condensed as follows:—To the inside of the fire-door is fitted a perforated false door. The space of a couple of inches between the two doors is closed at the bottom and two sides. The top is fitted with a light flap of thin iron. When this flap is raised air rushes down between the doors and through the perforations in the inner door into the furnace. When the flap is shut down, no air can enter the furnace save between the fire-bars. The door is fitted with the simplest conceivable device, by which, whenever it is fully opened—as for firing—the flap is thrown up and air admitted. In order to retard the falling of the flap, a little mercury cataract is fixed on the top of the door, and the time during which air is admitted is determined by the rate at which the mercury can escape from the under to the upper side of a cup. As this cup fills, the air admission flap sinks and cuts off the supply of air. There is nothing about this apparatus to get out of order, and we are unable to see how anything can be simpler or better suited to the object in view. The apparatus has been tried on a very large scale in the steamship Republic, with results of the most satisfactory character.

We believe he has solved a difficult problem, in a way upon the whole satisfactory. We know by personal observation that he has completely succeeded in preventing smoke under difficult circumstances, which is perhaps no remarkable feat; but he has done more than this, for he has succeeded in effecting a considerable saving in fuel as well without reducing the evaporative efficiency of the boiler. This is a point of very considerable importance, as we have shown. Mr. Prideaux has brought a thorough knowledge of his subject to bear in working out the details of his invention, and this is no doubt the reason why he has obtained satisfactory results from it.

Metal Paper-Hangings.

Paper-hangings of tin-foil, a recent invention to which we have already alluded, seem to be gaining favor in Europe, and bid fair to secure a much more general use and wider application than was at first anticipated. *Chamber's Journal*, in alluding, to this improvement, says:

The sheets are from 30 to 40 inches wide and about 16 inches long. They are painted and dried at a high temperature, and are then decorated with many different patterns, such as foliage, flowers, geometrical figures, imitation of wood, or landscapes. When decorated the sheets are varnished, and again dried, and are then ready for sale. Tin-foil is in itself naturally tough, and the coats laid upon it in preparing it for the market increase the toughness. The hanging of these metallic sheets is similar to paper-hangings, except that the wall is varnished with a weak kind of varnish, and the sheet applied thereto. Thus, in this way, a room or house may be newly painted, without any small of paint to annoy or harm the inmates. Moreover, tin-foil keeps out damp, and as the varnish is a damp resister, the protection to the room is two-fold.

Experience has shown also that cornices, moldings and irregular surfaces may be covered with the tin-foil as readily as the flat surface; hence, there is no part of a dwelling house or public building which may not be decorated with these new sheets; and, as regards style and finish, all who saw the specimens exhibited at the reading of the paper were made aware that the highest artistic effects could be achieved at pleasure. The decoration of small tin plate for ornamental purposes has, we hear, been introduced into Cornwall—the county of tin. In this case, the color and pattern are printed on the plate by means of lithographic stones and rollers; but, to insure excellence and permanence, the plate must be heated. Difficulty was first experienced in keeping the plate at the required temperature, the upper part of the oven being always hotter than the lower; but it was overcome by fitting into the oven a vertical roundabout, which carried the plate from top to bottom of the oven during the whole process of heating. We think there are many purposes to which the plates could be applied beyond that of mere ornament.

OUR MINING SHAREHOLDERS' DIRECTORY.

[COLLATED WEEKLY FROM ALL NOTICES ADVERTISED IN S. F. JOURNALS.]

ASSESSMENTS.						
Name of Co.	Location.	Secretary.	S.F. Office, Assmt.	Levied.	Delinq't.	Sale.
Adams Hill Con. M. Co.	Eureka Dist.	W. W. Taylor.	414 California St.	25	Dec. 23.	Jan. 24.
AMAZON S. M. CO.	Ely District.	M. J. McMinna.	609 Sacramento St.	10	Oct. 22.	Feb. 14.
Amelia S. M. Co.	Ely District.	L. Caplan.	Merchants' Ex.	10	Jan. 3.	Feb. 8.
Arizona & Ute.	Wasbos.	J. Mac Maguire.	414 California St.	10	Jan. 10.	Feb. 10.
Baltimore Cen. M. Co.	Wasbos.	D. T. Bagley.	401 California St.	50	Nov. 12.	Dec. 18.
BUNKER HILL C. O. CO.	Cal.	Charles H. Knox.	pro tem 19 First St.	10	Dec. 3.	Jan. 6.
Cedeburg First South E. M. Co.	Cal.	N. Webster.		50	Dec. 27.	Jan. 29.
Chapin M. & S. M. Co.	Wasbos.	J. Swift.	45 Montgomery St.	25	Dec. 17.	Jan. 23.
Con. Virginia M. Co.	Wasbos.	D. T. Bagley.	401 California St.	3	1ec. 16.	Jan. 20.
CORRILLERA O. & S. M. CO. Mexico.		Henry M. Reed.	321 Washington St.	15	Dec. 21.	Jan. 21.
Crowley M. Co.	Idaho.	J. P. C. Palmer.	429 Montgomery St.	1	Jan. 6.	Feb. 15.
Empire M. M. Co.	Wasbos.	G. R. Spinney.	320 California St.	1	Dec. 12.	Jan. 15.
Esta Buena Con. S. M. Co.	Nevada.	A. Noel.	419 California St.	25	Dec. 16.	Jan. 22.
"420" M. Co.	Wasbos.	H. D. Howard.	122 Mont'ry St.	1	Nov. 23.	Dec. 27.
Florida M. Co.	Wasbos.	W. Watson.	414 California St.	1	Jan. 10.	Feb. 10.
GOLD RUN M. CO.	Nevada Co., Cal.	C. C. Palmer.	Market and Spear Sts.	10	Dec. 30.	Feb. 4.
Green Valley Blue G. Co.	Cal.	A. D. Carpenter.	Mercha's Ex.	25	Dec. 12.	Jan. 11.
Hale & Norcross S. M. Co.	W. Wasbos.	J. F. Lightner.	438 California St.	5	Dec. 12.	Jan. 15.
Harper & Ute.	Idaho.	J. P. C. Palmer.	396 California St.	1	Dec. 25.	Jan. 25.
IVANHOE S. M. Co.	Ely District.	Daniel Buck.	331 Montgomery St.	1	Dec. 12.	Jan. 19.
Jewett G. & S. M. Co.	Wasbos.	J. M. Buntington.	Merchants' Ex.	5	Dec. 13.	Jan. 17.
Josephine Q. M. Co.	San Luis Obispo.	G. Seacke.	305 Sansome St.	2	Dec. 4.	Jan. 13.
Kearney M. Co.	Wasbos.	R. W. Watson.	414 California St.	1	Dec. 11.	Jan. 14.
Kentuck M. Co.	Wasbos.	E. Swift.	415 Montgomery St.	2	Dec. 12.	Jan. 15.
Kentucky G. & S. M. Co.	Ely District.	J. P. Cavalier.	599 California St.	50	Dec. 2.	Jan. 11.
Lady Emma M. Co.	Cal.	A. D. Carpenter.	Merchants' Ex.	25	Dec. 12.	Jan. 11.
Lamar & Zorano M. Co.	British Col.	B. B. Minor.	419 Cal. St.	10	Dec. 12.	Jan. 25.
Magdalena S. M. Co.	Eureka Dist.	L. Kahlan.	Merchants' Ex.	10	Dec. 17.	Jan. 22.
McMahon S. M. Co.	Schell Creek.	G. R. Spinney.	335 California St.	25	Nov. 25.	Dec. 28.
MAMMOTH BLUE G. CO.	Cal.	G. R. Spinney.	Non Merchants' Ex.	5	Nov. 18.	Dec. 23.
Marion S. M. Co.	Ely District.	L. Kahlan.	Mercha's Ex.	5	Nov. 18.	Dec. 23.
Minnesota G. & S. M. Co.	Idaho.	Wm. Willis.	419 Cal. St.	50	Nov. 21.	Dec. 23.
MINA RIOJA M. Co.	Placer Co., Cal.	G. R. Spinney.	320 California St.	30	Nov. 19.	Dec. 23.
MONTAGNE BLUE G. CO.	Nevada.	G. R. Spinney.	419 Cal. St.	10	Dec. 12.	Jan. 14.
NET JEFFERSON M. & M. CO. Cal.		W. W. Clark.	418 California St.	15	Dec. 18.	Jan. 20.
Newton Booth Con. M. Co.	Ely Dist.	O. W. Lamb.	412 California St.	25	Dec. 30.	Feb. 1.
OPHIR G. S. & G. M. CO. Placer Co.		H. E. Rogart.	304 Montgomery St.	10	Dec. 10.	Jan. 25.
Orient S. M. Co.	Ely District.	W. Watson.	411 California St.	25	Dec. 13.	Jan. 20.
Overman S. M. Co.	Wasbos.	W. W. Watson.	414 California St.	\$5.00	Dec. 21.	Jan. 25.
Pacific Bonax Co.	Esmeralda Nev.	E. Leuba.	507 Montgomery St.	25	Dec. 31.	Jan. 30.
Pacific Coal M. Co.	Contra Costa Co.	A. Luchman.	First and Market.	10	Sept. 25.	Nov. 30.
Pacific Coast M. Co.	Cal.	A. D. Carpenter.	438 California St.	10	Dec. 12.	Jan. 15.
Pioche West Ek. M. Co.	Ely Dist.	T. W. Colburn.	419 California St.	25	Dec. 18.	Jan. 27.
Phoenix S. M. Co.	Eureka District.	J. Maguire.	419 California St.	50	Jan. 7.	Feb. 13.
PIERMONT M. & M. CO.	Nev.	J. W. Clark.	418 California St.	50	Nov. 2.	Dec. 30.
Placer G. & S. M. Co.	Placer Co., Cal.	J. W. Clark.	418 California St.	10	Jan. 6.	Feb. 6.
Poahontas G. M. Co.	El Dorado Co.	D. A. Jenniga.	401 California St.	50	1ec. 3.	Jan. 4.
POUL HILL M. & W. CO.	Cal.	T. F. Cronise.	438 California St.	10	Dec. 4.	Jan. 14.
RAILROAD CO. & S. M. CO.	Nevada.	H. F. Neure.	328 Montgomery St.	15	Jan. 7.	Feb. 13.
Red Jacket G. & S. M. Co.	Wasbos.	H. C. Howard.	419 California St.	10	Jan. 10.	Feb. 10.
Rising Star M. Co.	Enreka Dist., Cal.	H. M. Buntington.	Merchants' Ex.	15	Nov. 22.	Dec. 27.
SANDERSON O. M. CO.	Cal.	William Stuart.	419 California St.	10	Jan. 7.	Feb. 21.
Sanderson G. M. Co.	Cal.	W. Watson.	401 California St.	10	Nov. 25.	Dec. 27.
Settup Sun G. M. Co.	Ely District.	Henry Boyle.	Stevensons' Build'g.	30	Jan. 4.	Feb. 11.
Silver Hill M. Co.	Wasbos.	W. E. Dean.	419 California St.	2	Jan. 28.	Jan. 28.
Silver Peak G. M. Co.	Ely District.	C. C. Hobb.	419 California St.	20	Dec. 6.	Jan. 11.
South Charlot M. Co.	Idaho.	J. L. King.	411 California St.	20	Dec. 17.	Jan. 27.
SPRING MOUNTAIN T. CO.	Nev.	J. M. Buntington.	Merchants' Ex.	10	Jan. 25.	Feb. 17.
STANFORD P. M. CO.	Nevada.	Onas H. Fish.	419 California St.	10	Jan. 3.	Feb. 8.
Stanton M. Co.	Elko, Nev.	J. H. Johnson.	Merchants' Ex.	10	Dec. 26.	Jan. 31.
Succor M. & S. M. Co.	Wasbos.	W. H. Watson.	302 Montgomery St.	1	Nov. 17.	Dec. 27.
Summit M. Co.	Amador Co.	Geo. Davidson.	731 Montgomery St.	25	Dec. 17.	Jan. 20.
Teemusch G. S. & O. M. Co.	Cal.	F. J. Hermann.	418 Kearny St.	20	Jan. 8.	Feb. 12.
Teemusch G. S. & O. M. Co.	Cal.	F. J. Hermann.	Merchants' Ex.	10	Nov. 18.	Dec. 23.
Tehama Con. M. Co.	Schell Creek.	W. W. Seisdon.	414 California St.	60	Dec. 27.	Jan. 18.
Union Gravel M. Co.	Creek.	T. Derby.	320 Sansome St.	1	Dec. 7.	Jan. 25.
U. S. GRANT M. CO.	Cal.	Enos Taylor.	226 Clay St.	50	Nov. 15.	Dec. 30.
UTAH M. CO.	Cal.	T. B. Ward.	Merchants' Ex.	10	Dec. 12.	Jan. 15.
Washington & Crooks M. Co.	Ely Dist.	F. D. Cleary.	Merchants' Ex.	50	Dec. 21.	Dec. 26.
Ward Beecher Con. M. & M. Co.	Nev.	O. A. Jennings.	Merchants' Ex.	1	Nov. 21.	Dec. 28.
Yellow Jacket M. Co.	Wasbos.	D. W. Hopkins.	Gold Hill.	5	Jan. 4.	Feb. 4.
YULE GRAVEL M. CO.	Cal.	Wm. H. Watkins.	301 Montgomery St.	50	Dec. 18.	Jan. 18.

MEETINGS.			
Name of Co.	Location.	Secretary.	Office in S. F.
Black Diamond Coal M. Co.		B. Peart.	224 California St.
Cherokee Flat Blue Gravel Oo.		H. Picheo.	603 Washington St.
Contra's M. Co.		Wm. Willis.	419 California St.
Elko Quickstart M. Co.		W. H. Watson.	302 Montgomery St.
Ely Con. M. Co.	Ely District.	T. W. Colburn.	419 California St.
Emerald Hill M. Co.		F. Madge.	Merchants' Ex.
Meadow Valley East Ek. S. M. Co.	Wasbos.	T. W. Colburn.	419 California St.
Miner M. Co.	Ely Dist.	T. W. Colburn.	419 California St.
Pioche West Ek. M. Co.	Ely Dist.	T. W. Colburn.	419 California St.
Gray & Bishop S. M. Co.	S. Phillips.	S. Phillips.	413 Montgomery St.
Gold Run M. Co.	Nevada.	C. C. Palmer.	Cor. Market and Spear Sts.
Gold Run Gravel M. Co.		G. V. DeLorme.	506 Montgomery St.
Rossuth M. Co.			

THURSDAY, Jan. 9th, 1873.

seen prior, at least the increase will be still

greater. Its assistance to quartz mining is too well known to need comment, and it has materially aided in developing our mines throughout the Coast by facilitating bleating operations, and thereby increasing the yield of gold.

THE following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

WOLVERINE.—Calaveras *Chronicle*, Jan. 4. The main shaft of the Wolverine is now about 270 ft. deep. The vein, in bottom, is 4 ft

Countees and Democrat which their level cuts, pay better and the veins are larger than on the surface. The Democrat, which they are now working, was not supposed to be worth

WOLVERINE.—Calaveras Chronicle, Jan. 4

ledge with a vein on either side running parallel, and in no place are they more than 20 ft. apart. Mr. McKeadney and Col. Rand are the only miners who have gone down to any con-

only miners who have gone down to any considerable depth on this hill, and both have

proved the fact that the quartz in this belt of ledges never ceases to carry gold, but on the contrary get richer as they go down. Mr. McK. has now in successful operation steam hoisting works 100 feet below the surface. In a few months he contemplates moving his mill immediately on the mine.

NAPA COUNTY.

WHITTON.—Cor. from Yountville to the Napa Register: This mine is located about 7 miles west of here, near the line between Napa and Sonoma counties and opposite Rutherford's Station. It is 1760 feet above the level of the valley. It was discovered by R. J. Whitton in 1865. A company was organized called the "Summit Consolidated" composed of R. J. Whitton, W. T. Whitton, W. H. Whitton, J. M. Whitton and A. C. McDonnell—all residents of this place. They kept the mine until last summer, when after expending \$11,000 on it, they sold out to Mr. J. Pershacker, the present owner, for \$45,000. Mr. P. has spent about \$25,000 more in improvements, and is just beginning to make it productive, the first shipment of 32 flasks of quicksilver having been recently made. These flasks contain 76 pounds each, and, at present prices, are worth \$64.50 per flask. The old company had produced 262 flasks up to the time of sale, making the total product of the mine thus far, 394 flasks. The present management is working 26 Chinamen, and 14 white men. A south extension of the "Whitton" called the "Overland," was discovered 10 months ago, and has 100 ft. of tunnel run.

NEVADA COUNTY.

MOORES AND WOOLSEY'S FLATS.—Nevada Transcript, Jan. 4: The Illinois claim, at Moore's Flat, is now yielding handsomely. In twelve weeks' run they took out \$14,000, of which \$8,000 was profit. The Eagle Company, at Moore's Flat, having taken out \$8,000. The Oriental, at Woolsey's Flat, cleaned up \$8,000. A chunk of gold, worth \$659 was found in these claims a few days before they cleaned up. The Boston claims, owned by Hagerly & Co., have yielded about \$60,000 this season. The Company has made a contract with Marke & Co., to run 1,500 ft. of bed rock tunnel. The Blue Bank at Woolsey's have taken out \$7,000.

EUREKA MINE.—Grass Valley Union, Jan. 1: The Eureka made a clean up of \$7,000 last Saturday, after a run of 7 days with 10 stamps. The mine is looking very well and considerable prospecting is being done.

GREEN MOUNTAIN.—Jan. 3: This mine, situated on Osborne Hill, is doing very well. The company have had their 5-stamp mill running for a month past, and gold to the amount of about \$5,000 has been cleaned up. The ledge is looking splendid, and some very rich rock was taken out last week.

COE.—At this mine Mr. Hill is at work putting down an escape shaft. That will be 100 ft. in depth making an egress in case of accidents. The Coe shaft is down 450 ft., and in 50 ft. more it is expected that the pay chute will be cut.

EMPIRE.—Jan. 4: The Empire is paying well. We yesterday saw, at Delano's bank a bar of gold valued at \$9,500, which was taken from the Empire mill after a run of ten days. The Empire has produced, within the past four weeks, gold to the value of \$19,500.

GRASS VALLEY.—We are glad to hear that this Co. has struck a good ledge which shows free gold and is heavy with gold-bearing sulphurets.

GREENHORN.—Jan. 7: This mine is doing well. The mill has plenty of water, and is running night and day. Saturday last a rich strike was made in the 3d level, 315 ft. down, and in an hour or two about \$400 worth of specimens were sent to the surface. The ledge in that level is from 12 to 18 inches in thickness. The ore now being milled will pay about \$20 to the ton, excluding picked rock.

PLACER COUNTY.

JULIAN.—Placer Herald, Jan. 4: From Mr. Schnabel we learn that the new twenty-stamp mill commenced crushing ore on Monday last, and works finely, and from the appearance of the plates the rock is yielding well. The ledge and mill are near Newcastle, and are now being worked under bond. It yields low grade but even paying rock. This mine promises to be a second Amador.

PLUMAS COUNTY.

GREENVILLE.—Quincy National: Bidwell & McIntyre have just completed their new 24-stamp mill, and commenced crushing quartz from their mine—the Union—on the 26th ult. They have opened the mine to a depth of 500 ft. Operations in their main lower tunnel have been in progress for the past two years, or nearly so, and it has cost the company \$20,000. The tunnel is 1,425 ft. in length. This insures to the company about 250 ft. of milling rock above the lower level, and it is estimated that there is enough to run the mill for the next two years. The ledge in the drift shows a width of from 8 to 12 ft.

GENESEE.—This mine continues to yield some fabulously rich rock, some of which, taken out during the past week, it is thought will yield thousands of dollars to the ton. The Superintendent proposes to add a number of stamps to the mill as soon as possible.

LARGE FORCE.—The Eureka Co., it is said, will keep all the hands now employed at the mine, through the winter. The mills will have to shut down before long, probably, but the men will be steadily employed taking out rock and making ready for next season.

NISSER GULCH.—Mr. Bell is cleaning out his ditch and making preparations to work his claims at his point.

SALE OF KU-KLUX CLAIMS.—Messrs. Goodwin and Garrey have recently purchased a one-fourth interest in the Ku-Klux claims, near Hungarian Hill, of Messrs. McCready & Roes for the sum of \$1,500.

RICH.—Mr. H. C. Bidwell was in town the other day, and showed us a prospect which amounted to 4½ ozs., the result of washing a pan of decomposed quartz in the Genevieve. Mr. B. informs us that he had one each of quartz, weighing 102 lbs., which would pay \$1,000.

GOON CLEAN UP.—The New York claim at Sawpit has paid much better than was anticipated for the past season. The recent rain furnished water for washing up the drift dirt which has been accumulating in the dump-house, and the yield is at the rate of about \$10 per day per man.

SAN DIEGO COUNTY.

THE COAL DISCOVERY.—San Diego Union, Dec. 26: Confirmation of the intelligence of the discovery of extensive coal fields in the vicinity of Temecula, in this county, is brought from San Bernardino by Judge Winder. Persons from Temecula had arrived at San Bernardino, bringing with them samples of the coal. They state that the deposits are very large, and that veins of coal can be found in all the hills in the vicinity of Temecula and San Jacinto. The Judge brought with him samples of the newly discovered coal. It is an excellent article of fuel, and if the deposits are half as large as represented, San Diego will supply the State with coal.

SIERRA COUNTY.

A BIG CLAIM.—Nevada Transcript, Jan. 4: J. M. Hickey, in company with Marke & Co., own a valuable mining claim at Brandy City, Sierra county. During the last season they have had abundance of water, and have taken out \$130,000, as the result of their work.

SONOMA COUNTY.

GEYSER PEAK QUICKSILVER.—Santa Rosa Democrat, Jan. 4: Mr. William G. Greene, in company with E. White, located the above named mine within about 6 miles of the Geysers. There are 3,000 ft. in the mine, and Mr. Green considers the discovery of great value. An specimen of the croppings was left here. If there is a deposit of the same character there can be no question of its value. A man was put to work, and Mr. Green will at once return and put on a sufficient force to test promptly the value of his discovery.

TUOLUMNE COUNTY.

DISCOVERY.—Tuolumne Independent, Jan. 4: Judge Lynch, an old mountaineer, has discovered a good quartz vein between the Spring Gulch mine and the Old Hunter mine, on the north boundary of Hunter cañon. He informs us that the vein is 2½ ft. deep, and the lead widens as they go down. It is thought that at a depth of 50 ft. the vein will be 10 ft. wide.

The Tuolumne Water Co. have now an abundance of water, and after a few necessary repairs to the works—expected to be completed yesterday—will run a full supply.

Nevada.

ELY DISTRICT.

BULLION.—Pioche Record, Dec. 28: The bullion shipments for the past week amount to \$73,289.00.

PORTLAND.—From the 100-ft. level a winze has been sunk 300 ft. in ore, the vein averaging from 2 to 3½ ft. wide. The ore for the last few ft. in the bottom has greatly improved and of superior quality. About 60 tons of first-class ore is now on the dump and as much more of second class is being cleaned. Average assays of \$250 per ton. Three shifts are at work. They are sinking a winze, and will cut the ledge in the working shaft at a distance of about 240 ft. Only such ore is being taken out as is met in the process of sinking and drifting.

RAILROAD.—This claim was located some months ago. The mine has got to the depth of 20 ft., with a ledge showing good ore for a rich strike before 50 ft. will be sunk. It is about 250 yds. distant from the Sunbeam, and alongside the Bullionville railroad track.

MALDONADO.—This mine was located in March, 1871, and is on the same mineral belt running from the Alps to the Sunbeam, and in a northerly direction about 300 ft. from the Silver Peak. The shaft has been sunk 95 ft., and about 24 ft. of ore below the ledge was struck and ore assaying \$50 per ton extracted.

ALPS.—During the week a rich ledge was cut in the drift from the main shaft. Drifted on the ledge 20 ft. The ore-vein is from 18 to 28 in. wide, with \$200-ore in sight. They are building a permanent ore-dump; they will forward and have milled immediately some 300 tons. The ore from this mine, worked last spring, yielded \$145.

CHIEF OF THE HILL.—A contract has been let to sink a shaft 200 ft. from the level of the tunnel, which has already reached a depth of 20 ft. The prospects are good at the present depth. The Magnet Mill commenced crushing ore for this company on Friday.

MONTANA.—The shaft is now 100 ft. deep, in quartzite and quartz, and all the indications point to the close proximity of a large body of ore. The work will be prosecuted night and day.

PIOCHE CHAMPION.—The main shaft in this mine, which was started about the 1st of October last, has now attained the depth of 230 ft.

GREY & BISHOP.—This mine is being worked vigorously. Three shifts of men are kept constantly at work. The indications are very favorable for a permanent ledge.

SPRING MOUNTAIN TUNNEL.—Superintendent Phillips feels confident that within the coming week he will make a rich strike.

SILVER PEAK.—Work is being carried on briskly.

WASHINGTON CO. CLAIM.—The mine is located in the Wasatch Mountains, within 4 miles of Kanarrva, Kane county, Utah. Veins have been opened in two or three places, and the work of development continues. A tunnel 677 feet is being run into the mountain, and the valuable deposits are being extracted. Owing to the heavy weather and the bad condition of the roads no coal is now being sent to market, but every preparation is being made for shipment to market early in the spring. A road from the mine to the valley is now being built, and will be completed in time for the opening of the spring trade. The coal beds are only about 90 miles from Pioche, and a road between this point and Kanarrva can be constructed at a trifling expense. Near to the coal beds are found vast deposits of iron, which, with coal at hand, will in a few years be utilized and added to the wealth of the world. The coal and iron so near to our doors, will cheapen the process by which silver is brought to the surface, and will permit the working of much rock now wasted on account of the expense.

HUMBOLDT.

GALENA.—Ulenville Silver State, Jan. 4: The Trinity mine, near Galena, is represented as being the richest in the State. Last week, at a depth of 25 ft. below the surface, a fine body of ore was struck.

HENNING MINE.—Twelve miners are now employed on the mine. The ledge is looking well, and is yielding considerable ore, which is being reduced at the Pioneer Mill. The company has expended several thousand dollars in building a road to the mine, and contemplates the erection of a furnace at an early day.

M. O. HANSEN.—J. O. Harris and J. C. Phillips, both experienced miners, have leased the Inskip mine, of the Pioneer & Inskip M. and C. Co., till the 1st of September next. The lessees will commence work on the mine immediately with a force of 4 or 6 men.

REESE RIVER.

BELOMONT.—Reese River Review, Dec. 31: Mr. Crockett reports from Belomont that he has spent several days at that place, during which time he examined several of the principal mines there. He speaks in the highest terms of the mineral resources of the district, and is of opinion that the mines in that district will in a short time prove the most productive in the State.

BULLION FROM BELOMONT.—Last week there arrived here, by F. & C. Co.'s freighter for San Francisco, seven bales of bullion, weighing 644 lbs., valued at about \$14,000. The bullion was shipped by the Monitor.

BULLION FOR DECEMBER.—W. F. & Co. shipped from their office in Austin, during the month of December, 25 bars of bullion, weighing 2,485 pounds and valued at \$35,299.09. It was all from the Manhattan mill, which was closed for repairs during the greater portion of the month.

BULLION SHIPMENT FOR 1872.—W. F. & Co. shipped from this city during the past year 754 bars of bullion, weighing 83,675 pounds, valued at \$1,074,618.92.

BELOMONT.—The rich strike of last week in this mine proves to be of a greater extent than it was at first supposed, and the ore is of a better quality. Work on the transport and the incline is increasing in size as the work progresses. The hrest of ore in this place is over five feet. All the slopes in the mine look splendidly.

MONITOR.—Cor. from Belmont, Jan. 4: The mill of this Co. has been running steadily on ore from the Monitor. Some 20 tons of ore per day are taken from the dump. The north level is now in 180 ft. from the lower tunnel. The winze being sunk from the level above is still going down rich ore. The slopes above the upper level look well.

EL DORADO SOUTH CO.—This company's mill is nearly completed. The machinery has been placed on top of the Steffelsfeldt furnace. The battery, pans, settlers, boilers and engines are set and ready to start up.

The work in the El Dorado progresses as usual. The size of the incline in the south is increasing in size as the work progresses. The hrest of ore in this place is over five feet. All the slopes in the mine look splendidly. A new boiler has been put on the mine for furnishing steam to the pump below.

This company's Arizona mine looks better than ever. The lower slopes show a breast of ore four feet wide, all of which from wall to wall will average between \$200 and \$300 per ton.

WASHOE.

BELOHER.—Gold Hill News, Jan. 4: Daily yield about 300 tons. The ore hrests on the floors above the 1000-ft. level show increased quantities of gold. Some of the ore taken out during the week is richly spangled with this precious metal. The 1000-ft. level is looking up and yielding splendidly, as usual. The 1200-ft. level is still continued south, the face of the drift being 247 ft. from the Crown Point line, and in fine ore. Sinking the main incline below the 1200-ft. station was resumed last night.

The 1200-ft. station is being opened in proper shape, and the drift north to it to connect with the south drift is already in 28 ft. of distance to go in order to connect this precious metal. The 1200-ft. level is looking up and yielding splendidly, as usual. The 1200-ft. level is still continued south, the face of the drift being 247 ft. from the Crown Point line, and in fine ore. Sinking the main incline below the 1200-ft. station was resumed last night.

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southerly direction. At the third station, or 800-ft. level, a main drift has been started, running in a south-westerly course.

STATE NORTHERN.—The water tanks, new pump-hobs, and other pumping machinery on the lower levels, are finished, and all in excellent working condition. The pumps are now hoisting water with the greatest ease from the 1,700 ft. level. The north winze, from the 1,500 to the 1,700-ft. levels, is down 132 ft. the sinking making fine progress.

CONS. VINDICTA.—The shaft is down 110 ft. below the 500-ft. level, in good working order, the sinking making excellent progress. The main north drift on the 1,167-ft. level from the Gould & Curry shaft is still pushed steadily ahead. The new machinery is working splendidly.

CALEBONIA.—The ore in the north drift on the 700-ft. level of the new shaft shows a most decided improvement. The new drift ascending from the main tunnel on the 700-ft. level is in 30 ft., making good progress, the drift south on the 300-ft. level of the old works is looking much more favorable.

SIEDRA NEVADA.—This mine continues to yield about the usual amount of good milling ore from the upper and middle portions of the old mine. The prospecting drift at the 600-ft. level of the new shaft are pushed steadily ahead.

REO JACKET.—This company will resume work by the first of February. The ledge is now six ft. in width.

SCORPION.—Situated at Six-mile Canon, close to Bidleman's ranch. Cleaning out the tunnel, which was run in 1864, 830 ft. in length, cutting two lodges, one of 600 ft. and one of 6 ft. The carrying gold only, and which paid at that time \$16 to \$18 per ton.

INDEPENDENCE AND OMEGA.—Located in 1859, and situated north of the Utah mine. Will resume work by sinking a shaft east of the tunnel, and put up all necessary machinery immediately. They cut a ledge six ft. in width in 1865, which assays well only 50 ft. from the surface.

SILVER HILL.—Work in the shaft progressing slowly. The main drift south on the first level is still in good ore. The north drift on the first level is pushed ahead.

INSURANCE.—Retimbering the air shaft is finished, and everything again in good working condition. The incline is down 92 ft., having partially cut through the ore body. Over half of the upper side of the shaft is still in good ore.

UNION CONS.—The north drift, from the main west drift on the line of the ledge has been stopped for the present, and another started near the east wall of the ledge which is now in about 30 ft. running through low grade ore.

LADY WASHINGTON.—This claim adjoins the New York Cons. on the south. The company will commence work by sinking a shaft and building the necessary hoisting works, and also putting up powerful machinery immediately, as the intention is to sink the shaft about 1,500 ft. in depth.

BUCKETE.—The Hope and Sherman mills are kept steadily running on ore from this mine. A fine body of ore was struck during the week in the prospecting drift 600 ft. south from the main incline.

MINT.—Work in the shaft has progressed slowly on account of the constant influx of water. The assays of ore for the week show a decided improvement.

BALTIMORE CONS.—The drift at the 250-ft. level is in 200 ft., the face is still in hard blasting rock. Owing to lack of wood, light progress has been made in the shaft.

KENTUCK.—Considerable good ore continues to be gleaned from the old workings of the mine about the 500 and 600-ft. levels.

IMPERIAL EMPIRE.—The surface work for the new machinery is making steady progress.

NEW YORK CONS.—Lack of wood still prevents work at the shaft.

ANOTHER RAISE.—Another raise commenced in the main tunnel. Work in the old raise is steadily progressing.

JULIA.—Sinking the shaft is making excellent headway. The main east drift on the 800-ft. level is in 265 ft., the face still in low grade ore.

PICTURE.—The principal work being done at present is the sinking of an incline from the main drift, in good line, south from the main incline.

CROWN POINT RAVINE.—This shaft is cleaned out and repaired and is now in good working condition to the depth of 120 ft.

KNICKERBOCKER.—The main west drift is in 468 ft. no material change in the character of the rock.

COODENTAL.—The main tunnel north is pushed steadily with no new developments.

UTAH.—Still running the north drift on the old adit level.

WOODVILLE.—Shaft down 330 ft., and still sinking in good pay ore.

Arizona.

MINEING MATTERS.—Prescott Miner, Dec. 21: The Marcus Co., of Weaver District, are still crushing ore with their arrastra, and the placer mines of said district are and have been taking out considerable gold, some of which is very coarse, as we learn from gentlemen who have recently seen several nuggets in possession of several citizens of Wickenburg. The gold of the Marcus mine contains \$19.50 to the ounce.

In Walnut Grove District, Allen Cullumber has two stamps and an arrastra at work, taking out gold. The War Eagle Co., in Bradshaw mountain, have commenced operations with renewed vigor, owing to the above which Capt. J. M. Irvin, who has recently bought in, is taking in the work of mining and milling. It is hoped here that the recent fall of snow will give rise to a heavy quantity of water, and that the mill and arrastra, in which case, they will, undoubtedly, secure a great deal of gold.

A party of prospectors started out this week for the Pinal Mountain country, where they expect to realize good wages from placer mines.

Another prospecting party will soon leave Prescott for the Santa Maria country.

Utah.

UTAH MINES.—Utah Mining Journal, Dec. 30: Three mines in Dry Canon, Ophir Dist., the Utah Queen, Congress and Miami, now in bonanzas, have been sold to Eastern capitalists.

A rich discovery has just been made at Bingham, in the foot hill of the west mountain dist.

The Utah Southern Railroad, pushing out from Salt Lake City to the great mining districts towards the south, the Pioche district being the objective point, and afterwards the Colorado river, has been advanced from a mere paper job to one of actual construction; several miles are already finished, and in a short time the track will be laid to Pioche. Not less than 300 freight teams are now employed in hauling freight over that route.

OPIMUM CULTURE.—Some time ago we printed a statistical article showing the wonderful profits accruing from the cultivation of the poppy and the production of opium. It is probably ten-fold more profitable than any other branch of agricultural industry. The climate and soil of the great San Joaquin valley are exactly similar, it is stated by those who know, to those of the valley of the Ganges, the greatest opium producing district in the world. There is no doubt that this valley is suited to the production of opium. We hope that the culture of the poppy will be tried and that the experiment of producing opium, so easily made but so important in its nature, will receive the attention and effort it deserves. If we can produce opium we have a mine of wealth richer than Golconda or the fabled Land of the Golden Fleece. Try the experiment.—Tulare Times.

The Falls of Oregon.

We present our readers this week with an illustration of the Falls of the Willamette river near Oregon city, and of the lower Multnomah Fall, 50 miles from Portland. The engravings are drawn from C. E. Watkins' celebrated photographic views of the great Northwest, the originals of which can be seen with other fine views of Pacific coast scenery at his world-renowned gallery, 22 Montgomery street, S. F.

So small a cut can give only a faint idea, of the magnificent scenery at the Falls of the Willamette. The cliffs on either side are over one hundred feet high, and are covered at the summit and in the less precipitous places with a growth of evergreens. Along the bank on the right hand side of the picture are the magnificent locks built the past season. They will pass a boat two hundred feet long and forty feet wide, and at the same time furnish a water power of 4,000-horse power capacity. They have been blasted out of the solid rock and built in the very best manner.

There will be over two thousand feet frontage for building factories upon and plenty of power to run them. Linn City was built upon this site but was swept away by the flood of December, '61.

The land calculated for building is mostly made from rocks taken from the lock and is above high water mark.

On the left hand bank for nearly half a mile below the falls, stretches the busy town of Oregon City. There is a level tract from forty to eighty rods wide between the river and the bluff, which is higher than the water above the falls, except in extreme high freshets. Just above the falls on this bank is the basin used by 7 or 8 of Holladay's boats for transferring cargoes from above the Falls. The arrangement has been so perfect that it is claimed that freight can be transferred from boat to boat for fifteen cents per ton. This basin gives a fine water power of which 500 to 600 horse power are used. This drives two grist mills, a woolen mill, a tub factory, a furniture factory, etc. A good part of the residences are on the level plateau above the bluff, and strangers passing through the place are not apt to form a correct idea of its size. The manufacturing facilities of this place are such that it is hoped that it will do more for Portland than Lowell has done for Boston. They are at present suffering great loss from the burning of the woolen mills which were the most extensive in the State. The prospect is that they will soon be rebuilt and running as successfully as ever. Messrs. Goldsmith and Teal the proprietors of the locks have purchased some boats to run on the Willamette, and it is expected that they will have a connecting line of steamers to run to San Francisco.

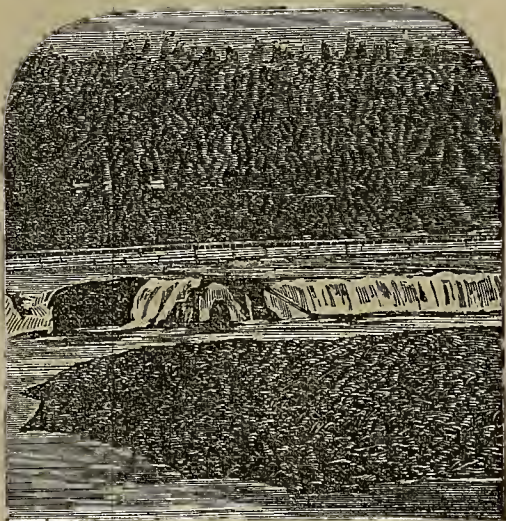
There will soon be a vigorous opposition for freights from Oregon to San Francisco.

How SOIL was MADE.—Prof. Agassiz says that all the materials on which agricultural progress depends are decomposed rocks, not so much those that underlie the soil, but those on the surface, and brought from a considerable distance, and ground to powder by the rasping of the glaciers. Ice all over the continent is the agent that has ground out more soil than all other agencies put together. The penetration of water into the rocks, frosts, running water and baking suns have done something, but the glaciers more. In a former age the whole United States was covered with ice several thousand feet thick; and this ice moving from North to South by the attraction of the tropical warmth or pressing weight of the snow and ice behind, ground the rocks over which it passed into the paste which we call soil. These masses of ice can be tracked as game is tracked by the hunter. He has made a study of them in this country as far South as Alabama, but has observed the same phenomenon in Europe, particularly in Italy, where, among the Alps, glaciers are now in progress. The stones and rocks ground and polished by the glaciers can easily be distinguished from those scratched by running water. The angular boulders found in meadows and the terraces of rivers not reached by water can be accounted for only in this way.

The claim of Delaney & Clever on the bar of the Klamath, some distance below the mouth of McKinley Creek, has continued to pay well, yielding from \$30 to \$40 per day, to the hand.

Silver Mining.

Few men are less affected by changes of weather, says the *Pioche Record*, than those who delve beneath the earth's surface for the shining silver, which brings competency to and provides labor for thousands, besides enriching the country and rearing houses upon the bleak hills of this sagebrush land—even building large towns and thrifty villages where a lizard could scarcely find sustenance. Other trades are often brought to a stand-still by the freaks of the weather. A cold snap sometimes interferes with the work of the plasterer by freezing his mortar; a wet spell drives the carpenter and the bricklayer from his labor. But he who penetrates the howels of the earth is unaffected by the changes in the weather. Be it during the severest winter, when the cold is pinching and the winds are howling, or in the heat of summer, when all things melt beneath the oppressive rays of the sun, or during the driving snow storm or beating rain, with a Washoe zephyr by way of an accompaniment, it is all the same to the miner. The temperature is the same throughout the year; bleak, cold December and balmy May are the same to him. Far from the surface, he is subjected to no inconvenience such as disturb those who move upon the earth's surface. It seems in the eternal fitness of things that the miner should be exempt from some of the evils to which other mortals are subjected. He suffers many privations unknown to others, and runs many risks of death or serious injury to which men in



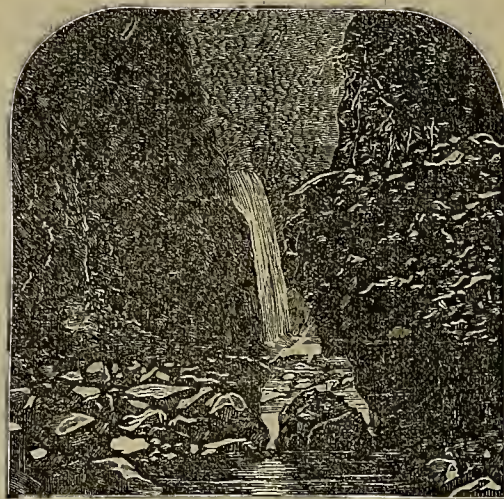
THE WILLAMETTE FALLS, NEAR OREGON CITY.

being compelled, through the exigencies of life, to pass the greater part of their time in pits and manufactories where ventilation is defective, or in which the air respired is poisoned by noxious fumes and offensive emanations from the materials undergoing the process of manufacture! How many are falling victims to the poisonous influence upon the heart of the atmosphere of an underground railway! What do these facts suggest? How are these evil results to be prevented? The simple answer is: Let the rooms in which you live be effectually ventilated by an incoming current of air filtered from all adventitious impurities, and so divided that no draught shall be felt; and by an outgoing current which shall remove from the apartments the carbonic acid, carbonic oxide, sulphurous acid gas, sulphuretted hydrogen, and other noxious compounds, as rapidly as they are generated.—*Popular Science Monthly*.

Pacific Trade Ports.

Chili.

Of all the republics of Spanish America, Chili is probably the most progressive, not excepting Peru. It may, indeed, be termed the California of South America, to which it bears many remarkable points of resemblance, both in climate, soil, scenery, agriculture and the character of its inhabitants. In one point it is far ahead of the Northern Pacific Coast of the United States, in that, with an area about the same as California, it has nearly four times as many inhabitants, its population being over two millions and a quarter. It is famous for its wheat, which formerly supplied the wants of California and Australia and is now exported to England at much more advantage than that of California, the cost of transport being only about one-half that from San Francisco. It also produces immense quantities of hides, and its



LOWER MULTNOMAH FALLS, COLUMBIA RIVER.

other business are strangers. His task is a hard one, yet he follows it day and night, bringing to the earth's surface the precious metals which throw their colossal wealth into the lap of commerce, spreading blessings and contentment through the land.

Interoceanic Canal.

From the report of the Secretary of the Navy are taken the following facts relative to the survey of a ship canal across the Isthmus between North and South America:

Commander Selfridge, who conducted the previous surveys of the Isthmus of Darien, is now engaged in completing the final exploration of that Isthmus between Panama and the shoulder of South America. Recent information favors the exploration of the valley of the river Bojaya, lying some ten miles south of and, in general, parallel to that of the river Napipi, already examined. This completed, the entire Isthmus lying south and east of the line of the Panama Railroad will have been sufficiently examined to establish the relative difficulties of constructing a ship canal, as well as the line lying further south, between the river Atrato and the Pacific Ocean.

The expedition to Nicaragua, destined for a similar purpose, is engaged upon the work assigned to it. An unlimited water supply, at a summit of 106 feet above the mean height of the ocean presents too favorable a feature to forego, a close examination of the whole region. Difficulties, stated in the report of the chief of the Bureau of Navigation, delayed the progress of this survey; nevertheless, a location for Lake Nicaragua to Brito, on the Pacific coast, is found to be more favorable than any hitherto known.

Necessity of Ventilation.

I hold that the breathing of impure air is a fruitful source of disease of the heart occurring after middle age. How many people ignorantly favor its occurrence by confining themselves to closely shut, non-ventilated, hot, stifling rooms, in which the carbonic acid has accumulated to two or three per cent. of the air they respire! How many are thus destroyed by

as it is the centre of a large district now open to settlement, in consequence of the cessation of the incursions of the Amacainam Indians.

Imports and Exports

Of Chili are large for the population, in fact, as large as those of the United States. We have already indicated the nature of the exports. They include as well, wool, wine and crude chemical materials largely. Their amount is about \$30,000,000, annually, and that of the imports about \$20,000,000. About three per cent. of the exports go to the United States, and about seven per cent of the imports are obtained thence. The balance of the trade is nearly all done with England and France.

Shall We Lose Our Tea Trade.

A serious danger now threatens the tea trade of this city. The Isthmus of Suez shortening by more than one-half the length of the passage from India to Western Europe and America, and allowing of the passage of ships of burthen, has been made use of to send cargoes of tea from China to New York by swiftly sailing steamers. The result is that the merchants of New York have been enabled to have cargoes landed at the doors of their warehouses without breakage and in prime condition at a less cost than they could obtain the same teas by way of San Francisco. It is said, also, that in consequence of the cargoes being unbroken during the voyage, that there is far less risk of accident, and that the teas arrived in far superior condition. It is evident that we have been relying supinely on the hope that our natural position placing us in the commercial

centre of the shortest route from Chinato New York, would suffice to secure to us the tea trade of a continent for all time coming. The awaking from this delusion is sufficiently unpleasant; let us hope that it will stir our merchants up to the necessity of adopting some means of securing cheaper transit. If not, they will be left only the local tea trade of the coast, and it is doubtful if they will be able to keep that entirely, for those who handle large quantities of goods can always handle them cheaply, and there is little doubt that the business men of New York would be content to lose a little on the Pacific Coast consignments of tea for a couple of years, to drive the San Francisco dealers from the market. And though by far the greater part of the tea im-

ported by way of this city for the last two or three years has merely passed through, our merchants were beginning to take their share of it, and in a dozen years would have monopolized it. Such houses as those of Castle Bros.; Adolphe Low & Co.; Macondray, etc., etc., were gradually feeling their way further East every day with the commodities imported from the Pacific Coasts and Islands, and were building up for the city a grand trade in the future.

Its Principal Ports

Are, first, that of Copisipo, which is as yet but small, but is the centre of the important copper trade of Chili.

We next meet with Coquimbo, which is connected by rail with Las Garcas. It is well built and has a large trade in exporting copper, equalling three quarters of a million dollars yearly. Its population is about 10,000.

Valparaiso, the principal seaport, is next met with. It is the largest and most important commercial city on the west coast of America, excepting only San Francisco. Its harbor is fine and spacious, semi-circular in form, but is exposed from the north. The growth of Valparaiso has been very rapid, and its population cannot now be much less than 100,000. It is connected with Santiago, the capital, by a railroad about one hundred miles long, and will doubtless within the next decade be united to Buenos Ayres on the Atlantic by a transcontinental railroad, girdling that part of the continent. This railroad has been long in inception, and in fact the road from Buenos Ayres westward may be considered but its commencement. Valparaiso exports largely wheat, hides and other agricultural and mining productions. The completion of the transcontinental line of telegraph puts it in connection with Buenos Ayres on the East, and with the completion of the projected line between Liebon, Rio de Janeiro and Buenos Ayres, its newspapers will be enabled to give their readers all the news of the world as quickly and as rapidly as do those of San Francisco its citizens now.

We next meet Concepcion, with a population of about 14,000, situated on a large square inlet looking to the north and the mouth of which is divided into two channels by an island. Concepcion has a good chance of being the western termination of the proposed transcontinental railroad, one of the lowest passes of the Andes lying east of it.

Valdivia, situated in the latitude of San Francisco, is like it also in having one of the finest ports in the South Pacific. It is as yet but small, but is rapidly growing in importance, inasmuch

as it is the centre of a large district now open to settlement, in consequence of the cessation of the incursions of the Amacainam Indians.

The *Chronicle* of this city has been proposing the building of a freight railroad, to cost \$100,000,000, and to pass south of the line of the Colorado. This is just what we want for the future, but how about the present. During the five years in which such a railroad would be building, we would, with things as they are now, have totally lost the trade, nay, Eastern merchants would have encroached on our own peculiar domain, and it would require ten years to recover the ground we had lost during the preceding five. We want to take action at once. And that action must be such as shall persuade the Central Pacific Railway Company, the China Mail Steamship Line, and the Union Pacific R. R. Co., that it is to their interest equally with ours to establish such a scale of freight charges for teas as shall render competition, via Suez, impossible. The majority of our business men not being in the tea line, may think that it is none of their business, but they should consider that the losing of the tea trade of the future will necessitate the loss of many other branches of trade which we are now endeavoring to grasp, but which will elude us as surely as the tea trade. We want immediate action on this matter.

BRITISH COLUMBIA MINES.—The *Standard* of the 28th says: The Seymour Narrows and Bute Inlet Railway parties have discovered iron and coal beds, rich in quality and of large extent. Application has been made to the Lands and Works for mining leases of the same. The discoveries will prove most valuable in connection with the building of the line of the Central Pacific.

Useful Information.

The Cause of Paint Cracking

One says because there is too much oil in it; another not oil enough; another thinks because it has dried too quick and soon. The fact is, says the *Coachmakers' Journal*, that more paint cracks from the use of oil, and hasty work than anything else. Some, in fact a good many painters persist in mixing their paint very elastic although, thinking that they will have a tough elastic coat like rubber, that will give to the swelling and shrinking of the wood, without cracking, and scarcely break apart, if the panel of a buggy were split in two. Well we will admit that in that way they can get a very elastic coat, and if it would remain that way and never dry, it would be the thing, but the paint will dry sometimes. Any material will contract in drying. Their elastic body of paint will continue to dry and contract until its elasticity gets to its utmost limits, then it will give way and spread apart in great gaping cracks.

To paint up a job with elastic coats of paint, it should go through a very long process, and the different coats be put on thin and not put on one coat of paint until the previous coat is perfectly dry. Putting on a number of heavy coats of paint or rough stuff as fast as they are fairly set will cause cracking of the worst kind either before or after varnishing. Paint is too often supposed to be dry, when it is really not half dry. Six months of good drying weather would be a short time to get a coach body ready for the varnish on the elastic or tacky principle, and that is not all there is to contend with; in the oil process, the oil will sweat through the varnish and cause it to lose its brilliancy or luster.

The quick process, or flat coating, can be hurried so that it will crack, and crack badly. Our few limited ideas about obviating cracking are all summed up in a few words, viz: let every part of the wood be thoroughly primed with a good fresh priming; prime inside and out, so the weather cannot act on the wood; let the priming get perfectly dry; then mix every coat of lead and rough stuff with japsans and varnishes that will dry firm and hard; put enough in to bind the paint well and no more; have every coat dead color; do not put on the coats too heavy; let every coat be bone dry before putting on another; put on enough of coats to fill the grain of the wood, and make a perfect surface, and no more, then you will have a body of paint that is firmly bound together, and thoroughly dry, and when paint is thoroughly dry it can shrink no more (it only shrinks when drying) and if it don't shrink it cannot crack, and in this kind of a body of paint there is no moisture or oil to sweat out and destroy the luster of the varnish. Painting of this description will not crack until the joints of the wood begin to give away and let the water and damp atmosphere in and swell the wood along the edges of the joints and cause the paint to crack from the swelling and shrinking of the wood. Varnish may crack on the top of the best painting.

If the paint is not well protected by varnish it will perish in time, sooner or later, owing to how well it is protected. The ravages of time will destroy anything that is temporal. Now-a-days, painters will paint jobs in two weeks, and wonder why it cracks; the blame is generally laid on the material or anything else but the right cause.

CURIOUS CASE OF SPONTANEOUS COMBUSTION.—We have from France a well-attested case of spontaneous combustion, the particulars of which are thus given in the "Comptes Rendus" of the Academy of Sciences. On one of the hottest days of last summer, M. Wattier-Guérin, a manufacturer of Rihemont, happened to observe a light smoke rising from an oaken beam which had for a considerable time stood in the courtyard of his premises, one end leaning against a wall. This beam was some twenty feet in length and six by nine inches square, and stood perfectly isolated, with the exception that an old well-cover made of boards, sheath-iron, and slates, leaned against it. On coming nearer, M. Wattier saw that the beam was on fire, but gave out no flame, the surface presenting the appearance of an extinguished coal fire. By blowing upon it, it was found to be burning vigorously. This fire did not commence at the lower extremity of the beam, but at the point where it came in contact with the well-cover. Thence it spread upwards, advancing in the form of a V, and finally involved the entire thickness of the beam, extending over ten feet in length.

ARTIFICIAL VOLCANOES.—A Viennese chemist, Hochstetter, has been experimenting upon the artificial production of volcanic eruptions in miniature. His process is based upon a certain property possessed by sulphur, in virtue of which that substance, when melted under the vapor of water having a pressure of three atmospheres, absorbs a certain amount of the water, and then the latter, as the sulphur cools, escapes in shape of steam. Thus, if you take a hundred weight of sulphur, and subject it to the above treatment, when cooling begins a superficial crust is formed; if then you make an opening in this crust, there will be a succession of explosions and emissions of steam and sulphur. In the course of an hour a cone will be formed, having a diameter of ten or twelve inches at its base, and two or three inches in height, closely resembling the cone of a volcano, formed by the successive currents of lava.

MIRROR PHOTOGRAPHS. as they are called, are silvered glass with a picture pasted on the back. There is no silver where the picture is seen, but on the sides there is enough metal to give the effect of a mirror. A person could have his photograph taken and so placed upon silvered glass as to enable himself to see what the camera had made of him and what reflected light disclosed. If platinum were to be employed in place of silver, the thin film would show no picture by transmitted light, but by reflected light the image would appear. Such a device as this would be capable of extensive application in show windows and interior counting rooms. Glass partitions could be so arranged that persons sitting behind them could see all that was going on in a store while they would themselves be invisible. It is thought that if a thin gelatin print were to be pasted upon the glass, an engraved picture could be produced by means of the sand blast, which could be subsequently silvered or not, according to the purposes to which it is to be applied. Elegant results could be obtained in this way for many ornamental purposes.

THE GREAT WALL IN CHINA.—Mr. Seward, in speaking of the great wall in China, which he examined during his late trip at the East, says: "The Chinese have been for the past two or three thousand years a wall-making people. It would bankrupt New York or Paris to build the walls of the city of Pekin. The great wall of China is the wall of the world. It is forty feet high. The lower thirty feet is of hewn limestone or granite. Two modern carriages may pass each other on the summit. It has a parapet throughout its whole length, with convenient staircases, buttresses, and garrison-houses at every quarter of a mile, and it runs, not by cutting down hills and building up valleys, but over the uneven crests of the mountains, and down through their gorges a distance of a thousand miles. Admiral Rodgers and I calculated that it would cost more now to build the great wall of China through its extent of one thousand miles than it has cost to build fifty-five thousand miles of railroad in the United States. What a commentary it is upon the ephemeral range of the human intellect to see this great utilitarian enterprise, so necessary and effective two thousand years ago, now not merely useless, but an incubrance and an obstruction."

TO MAKE COURT PLASTER.—To make court plaster, soak isinglass in a little warm water for twenty-four hours; then evaporate nearly all the water by a gentle heat, dissolve the residue in a little proof spirits of wine, and strain the whole through a piece of open linen. The strained mass should be a stiff jelly when cool. Now, extend a piece of silk on a wooden frame, and fit it tight with tacks and thread. Melt this jelly and apply it to the silk thinly and evenly with a hair brush. A second coating must be applied when the first has dried. When both are dry, cover the whole surface with two or three coatings of Balsam of Peru, applied in the same way. Plaster thus made is very pliable, and never breaks.—*Rural New Yorker.*

ORNAMENTING LAMPS.—I wonder if many readers are aware what a pretty effect may be produced by pasting with mucilage autumn leaves and ferns on the inside of porcelain shades. I refer particularly to the student lamp. Of course they should be the brightest, smallest specimens, and may be arranged either in clusters or a wreath all the way around. They should be prepared in the usual way, pressed or ironed. I brush mine with linseed oil, but I am not sure that is essential. They will remain bright two or three months, and when faded can be easily soaked off with warm water and replaced with others.—*Rural New Yorker.*

WETTING COAL FOR HEATING BOILERS.—M. Seidler refutes the opinion, so generally prevailing that wet coals burn better or produce more heat than dry ones. If the blacksmiths sprinkle their coal dust near the blast pipe with water, they merely do it to keep the top layer in shape. Wet coal burns as slowly as green wood, evidently from the fact that the water must evaporate before the fuel will burst out in flames. The author always obtained more steam by employing dry coal, and in a comparative trial, extending over a week, he saved fourteen tons of coal by not wetting it.

A BEAUTIFUL EXPERIMENT.—When fifteen to twenty grammes of granulated silver is introduced into a perfectly dry tube of hard white glass, with from thirty to forty grammes of bisulphide of carbon, and then hermetically sealed, on warming gently and then shaking in the dark, sparks are observed in the liquid, which by continued shaking may be rendered quite luminous. Pouring water on the tube causes the luminosity to disappear, but on shaking it becomes visible. This is a beautiful experiment. Iron and aluminum produce similar effects, while platinum, copper and zinc do not.

ARTIFICIAL SKINS FOR SAUSAGES.—In Wurtemberg there has been started a new industry, which consists in the manufacture of skins of parchment paper for sausages. This artificial product is considerably cheaper than the natural one; it is not subject to fermentation, and is distinguished for its cleanliness. It is made by means of machines, in the thickness of ordinary writing paper, and sent to any address through the Post Office.

Good Health.

CUNDURANGO AND SARSAPARILLA.—The famous cundurango, from which so much was expected in the cure of cancer, is said to have derived its name from the circumstance that the condor, (cundur) when bitten by poisonous snakes, eats its leaves as an antidote to their poison; hence *cundurango*, signifying condor vine. Its use in Europe as a remedy for cancer appears to have been attended with very doubtful success.

The *Philadelphical Medical Times* in speaking of this plant remarks that "It was not the curing of cancer, but it was the obtaining of a profit of somebats about 1900 per cent. (\$38 per pound on an article costing not \$2 per pound), that animated the advocates of cundurango. The bubble has, however, been pricked; and we presume that Messrs. Bliss & Keene, more in sorrow than in anger, watch the fading glories of their great specific. They are making a feeble stand, or some one is trying to do so for them, on its anti-syphilitic powers; this will perhaps work off this stock they have on hand, but it will hardly do more.

One point of curious dissimilarity may be noticed between the medical history of this article and that of its analogue, sarsaparilla; namely, the comparatively short time required for the explosion of the claims of the former. The explanation is undoubtedly to be found in the free and constant reports of the results of experiments all over the world, which modern means of communication alone could render possible. Sarsaparilla held its own in country neighborhoods, retired towns, and remote places, long after it had been tried and found wanting at the great centres of medical science. Cundurango is known as a stupendous failure wherever it is known at all."

PHENOMENA OF THE BRAIN.—One of the most inconceivable things in the nature of the brain is that, although the organ of sensation, it should itself be insensible. To cut the brain gives no pain; yet in the brain resides the power of feeling pain in any part of the body. If the nerve which leads to it from the injured part be divided, we become instantly unconscious of suffering. It is only by communication with the brain that any kind of sensation is produced; yet the organ is itself insensible. But there is a circumstance more wonderful still. A certain portion of the brain itself may be removed without destroying life. The animal lives and performs all those functions which are necessary to simple vitality, but it has no longer a mind. It cannot think or feel. It requires that the food should be pushed into its stomach; once there it is digested, and the animal will even thrive and grow fat. We infer, therefore, that a part of the brain is simply intended for the exercise of the intellectual faculties, whether of the lower degree, called instinct, or of that exalted kind bestowed on man, called reason.

NOW AND THEN.—The *Pulse of Health* says, in relation to, and deprecation of, what it calls "Sensational Hygiene": Certain facts are so patent—as for instance, that the present cookery is far better than that of twenty years ago; our clothing warmer in winter, cooler in summer, and every way more sensible than that of the last generation; our modern houses incomparably more convenient and comfortable than those they replace; our habits of life, in every essential respect, more healthy, cleanly, and refined than those of any other nation or age; and, finally, as the direct outcome of these improved conditions, the average of life is so steadily increasing—these facts are so obvious and pertinent that the necessity for exaggeration, dogmatism, and sensational half-truths concerning hygiene, if such necessity ever did exist, certainly exists no longer.

PHOSPHATED CANDY is the latest novelty in the medicated line. It is based on this popular, though not yet well established idea, that there is a brain waste of phosphorus which ought to be made good by some special or medicated food. Phosphoric acid, associated with iron, is sometimes prescribed by physicians; and the idea of disguising the unpleasant nature of phosphoric acid by administering it in candy is certainly ingenious and may be advantageous. We are a nation of candy eaters and as bonbons are popular everywhere, perhaps we may as well employ them as an agreeable vehicle for taking disagreeable medicine, as indeed is already done to a considerable extent.

ACTIVITY AND HEALTH.—Men who have half a dozen irons in the fire are not the ones to go crazy. It is the man of voluntary or compelled leisure, who mopes and pines and thinks himself into the mad-house or grave. Motion is all nature's law. Action is man's salvation, physical and mental; and yet nine out of ten are wistfully looking forward to the coveted hour when they shall have leisure to do nothing—the very siren that has lured to death many a "successful" man. He only is truly wise who lays himself out to work till life's latest hour, and that is the man who will live the longest, and will live to most purpose.

HOW TO WALK.—A smooth, long step, the weight of the body on the loins, where nature intended it should be, and the legs propelled from thence, without either stiffness at the knee or obtrusive motion of the hips, is, probably, the ideal of walking, and such one finds both in a highly trained woman and the untutored perfection of a South Sea Islander.

A STRANGE DISEASE.—Intense radiation of heat in the great desert of Sahara produces extraordinary effects on insects as well as animals and men. When a caravan starts out to traverse that wide waste of desolation, flies follow on in prodigious multitudes, attracted, no doubt, by odor from the camels, but they soon drop dead by the intensified heat. Fleas, burrowing in hair, straw, or sacks, are killed off rapidly. But the most singular of all is the malady to which men are incident after being exposed a short time to burning sands and a vertical sun on that arid and life-forsaken region. It is called *ragle*—a kind of brain fever. The stricken traveller is delighted, amused, and made extensively happy by exhibitions of fantastic forms. He sees mirages, palm-trees, groups of tents, shady mountains, sparkling cascades, and misty forms dancing delightfully before his entranced vision. From all that can be gathered upon the subject, it appears that a certain condition of atmosphere, wholly free from moisture, with intense solar heat, produces effects on the brain similar to hashish. Both exalt the nervous system, and speedily destroy all desire to exist, deprived of that unnatural excitation of the brain.

TAKING COLD.—If a cold settles on the outer covering of the lungs, it becomes pneumonia, inflammation of the lungs, or lungfever and in many cases carries off the strongest man to the grave within a week. If cold falls upon the inner covering of the lungs, it is pleurisy, with its knife-like pains and its slow, very slow recoveries. If a cold settles in the joints, there is rheumatism with its agonies of pain, and rheumatism of the heart, which in an instant sometimes snaps asunder the cords of life with no friendly warning. It is of the utmost practical importance, then, in the winter weather, to know not so much how to cure a cold as how to avoid it.

Colds always come from one cause, some part of this body being colder than natural for a time. If a person will keep his or her feet warm always, and never allow himself or herself to be chilled, he or she will never take cold in a lifetime; and this can only be accomplished by due care in warm clothing and avoidance of drafts and exposure. While multitudes of colds come from cold feet, perhaps, the majority arise from cooling off too quickly after becoming a little warmer than is natural from exercise or work, or from confinement to a warm apartment.—*Sci. Am.*

INDIA-RUBBER CLOTH IN SKIN DISEASES.—From a note translated by *The Doctor*, we learn that since 1868, M. Hardy, of Paris, has been employing india-rubber cloth in place of poultices or local baths. He employs pieces of cotton, covered with a layer of caoutchouc, and forming an impermeable tissue. This is only applicable to the extremities and to the head; and for the latter region he makes use of vulcanized india-rubber caps. After a certain time, the part enveloped becomes not disagreeably warm, and then an abundant sweating takes place, under the influence of which the crusts, and the squames which cover the skin are removed, the epidermis spreads over the ulcers, and the skin becomes softened.

The results obtained are similar to those obtained by poultices, but preferable for many reasons. Daily experience of the Hospital St. Louis shows a great rapidity in the modification of the skin; two or three days of application suffices completely to cleanse the scalp when covered with abundant scales of eczema, etc. After forty-eight hours' application of the india-rubber cloth upon hauds attacked with chronic eczema, with fissures and cracks in all directions, the wound becomes cicatrized, and the skin recovers its suppleness.

NEW CURE FOR RHEUMATISM.—There are a thousand pretended cures for rheumatic and neuralgic affections, not one of which is found to effectually eradicate them. If a remedy could be devised to answer that end, its discoverer would be entitled to the thanks of the world, and might amass for himself a colossal fortune. A therapist of London thinks he has hit upon it, in the administration of hot sand baths. He claims that its advantage consists in the fact that it does not suppress perspiration like the hot water bath, but rather increases it, and does not interfere with the respiration like the steam bath or Turkish bath. The body can endure its influence for a much longer time, and a much higher temperature can be applied. It can be used for infants, and permits of easy application to a part or to the whole body. Sufferers who are willing to resort to almost any expedient to relieve the intense pain of these diseases, will ascertain the efficacy of the recommended cure by giving it a trial.

IS CARBOLIC ACID POISON WHEN PURE.—Hamberger has ventured to assert that pure carbolie acid is not a poison, and that the poisonous properties of ordinary commercial acid is due to impurities in it. To this view Hnemann takes exception, and publishes the results of a series of experiments made with rabbits, in which all specimens of carbolie acid acted as poison, whether taken into the stomach or injected into the circulation.

LAXATIVE MIXTURE.—Prof. Lindley says the best remedy he has ever tried in habitual constipation, is to take a half drachm of Epsom salts, dissolved in half a pint of water—adding ten drops of Elixir of Vitriol—one hour before breakfast. The smaller the dose the better, provided it will operate. It may be taken for weeks till a cure is effected.



B. EWER..... SENIOR EDITOR.

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San Francisco:

Saturday Morning, Jan. 11, 1873.

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MINING STOCK MARKET.—Table of Daily Sales and Prices and Comparative Prices for the Week; Notices of Assessments; Meetings and Dividends; Review of Stock Market for the Week, 20.

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UTAH SILVER MINING CO., BINGHAM CANON, UTAH.—Professor Clayton who has just inspected this property, concludes an exhaustive report as follows: "I have no doubt about the extent, value and permanency of your mines. The report made to you by Mr. Henry Sewell, as to the extent and value of your mines, I believe to be correct in every essential particular; and if the mines have been worked at a loss the fault is more with the management than with the mines. It is true the ores are of low grade, but they are also abundant and easily mined. The fault is not with the mines; an ample working capital and proper skill to use it all that is required to place your property on the list of dividend-paying mines."

TOPOGRAPHICAL PLASTER MODEL.—Mr. C. W. Hendel, County Surveyor of Sierra county, has shown us at the Swiss hotel, Commercial street, a very finely executed model, in plaster, of the topography of State Creek and adjoining country, bordering upon the county lines of Sierra and Plumas. This model is the same that was exhibited at the late State Fair, and is a very fine and quite artistic piece of work. Such models are very valuable for reference and study. Every important mining section in the State should be thus represented.

MINERALS AND MINING IN JAPAN.—We have received a communication from Mr. Kaderly in relation to our recent notice of his collection of minerals from Japan, and also furnishing some further important facts with regard to mines and mining in Japan. The communication will appear next week.

CLEAN UP.—The Eureka, at Grass Valley, after a run of five days, with ten attempts, cleaned up, January 4th, from the amalgamators alone, without touching the battery, the sum of \$11,830 in gold coin.

ON FILE.—Query, from M. C., Little Lake Mendocino Co.; Letter from J. W., San Mateo.

The Mining Interest in 1872.

The year which has just closed has been a very prosperous one to the mining community, although it is more remarkable for steady, general and uniform progress than any marked and particular success. The quartz interests of the hulkion-producing States and Territories are in a flourishing condition and p'acer mining, particularly in California, is making rapid strides. We hear from all parts of California of large ditch enterprises, reservoirs for preserving surplus water, etc., which are to assist that particular branch of industry, and there is a growing confidence among capitalists to invest in gravel claims, which will encourage others to do likewise. The manner in which this work is carried on at present requires a considerable outlay of time and money to inaugurate it but when once in running condition the income is correspondingly great. The mining towns of the coast are improving in character and our miners are no longer considered a nomadic race, but seem content to settle down to business like people of other trades. This encourages industrious habits and gives permanent value to property in the mining towns which hitherto they up and fosters other industries. We have had no "excitements" or stampedes for some time and people really begin to look upon mining more as a legitimate business than as a venture.

Railroads are exercising their potent influence throughout the coast, and now, many mines which were previously thought unprofitable, are worked with success through having facilities for transportation. Many narrow-gauge roads are in process of construction or contemplated, Utah leading us in this respect. We have had few disturbances to chronicle among miners this year and few "strikes" or coercive measures. Accidents have been numerous but not out of proportion to the increase of quartz mining; but with improved appliances and more care we hope to have less the coming year.

Fluctuations of mining stocks in this city during the year have been great. In the earlier part everything was high and the community in a fever of excitement. The last eight months, however, stocks have been generally depressed, with a few exceptions, but business is expected to be better in the spring. The merits of the "diamond awindle" have been discussed at length in these columns, so it is unnecessary for us now to go into particulars concerning it. Large numbers of new quartz claims have been opened during the year and in Utah particularly, the increase in this respect has been wonderful. The foreign capital invested in the mines of this coast is a gratifying evidence of the estimation in which they are held abroad, and exercise also a beneficial influence on the localities where the investments are made. More care is now taken in buying mining properties and we are glad to see, in managing them also. A radical change is being effected in this last particular, stockholders having come to the conclusion that they have rights which trustees are bound to respect. There is still room, however, for improvement.

Bullion Product of 1872.

The profits of the year are naturally of much interest to us all, as showing material advancement and success. It is rather early as yet to give full returns from all localities and it may be mentioned that the yield of California has been lessened from want of water to work the placers, which will not occur this year; measures are now being taken to store up surplus water for use at the proper time.

J. J. Valentine, General Superintendent of the Bullion Department of Wells, Fargo & Co.'s Express, has prepared a statement of the production of precious metals west of the Missouri River for the year 1872. The total exceeds \$62,000,000, most of which passed through the Express Company as carriers, and may therefore be relied upon as essentially correct. We condense as follows:

Gold by Express.....	\$27,352,968
Gold by other conveyances.....	3,076,801
Silver by Express.....	24,196,719
Ores and base Bullion.....	7,610,436
Total.....	\$62,236,914

The sources of the above treasure are given in the annexed table:

California.....	\$19,049,098
Nevada.....	25,648,811
Oregon.....	1,905,035
Washington.....	226,051
Idaho.....	2,514,900
Montana.....	4,442,135
Utah.....	3,521,020
Arizona.....	143,777
Colorado.....	3,001,751
Mexico.....	535,072
British Columbia.....	1,350,074
Total.....	\$62,236,914

The product for the year shows an increase over 1871 of \$3,952,884, chiefly due to gains from Nevada and Utah.

Mr. Valentine says that he has used great care in ascertaining the amount of ore and base bullion, carried by freight and the percentage allowed for gold dust carried by U. S. mail, travelers, etc., is considered liberal. Express communication in Arizona being so limited, the figures concerning the product of that Territory may be incorrect.

The Nevada Yield.

Complete returns of the State have not as yet been received at the State Controller's office but the *Territorial Enterprise* places the gold and silver product of Nevada at between \$22,000,000 and \$23,000,000, which is two or three millions less than the figures given by Wells, Fargo & Co.

The following statement from the assessment rolls of the different counties of the State for the first nine months of the year will be interesting. We omit fractions of tone:

COUNTIES.	TONS EXTRACTED.	GROSS YIELD.	NET YIELD.
Elko.....	6,073	\$ 343,487.87	\$ 137,113.64
Esmeralda.....	3,406	74,165.56	19,809.49
Humboldt.....	6,233	254,618.07	81,653.56
Lander.....	40,895	1,871,378.43	687,889.31
Lincoln.....	37,776	4,001,788.39	2,270,897.36
Nye.....	2,152	327,734.06	144,485.36
Storey.....	293,717	9,337,378.05	4,105,190.02
White Pine.....	18,415	155,303.41	22,523.68
Total.....	407,670	\$16,825,851.86	\$7,673,563.42

COUNTIES.	TONS EXTRACTED.	GROSS YIELD.	NET YIELD.
Elko.....	2,444	\$ 17,208.90	\$ 1,763.07
Humboldt.....	9,150	96,921.86	9,692.18
Lyon.....	187,364	628,116.54	74,718.66
Lincoln.....	904	17,770.91	4,689.20
Storey.....	124,691	225,532.17	38,829.30
Washoe.....	6,521	36,610.00	9,591.00
White Pine.....	4,270	14,396.39	1,439.64
Totals.....	335,352	\$963,556.77	\$140,613.55

Total amount of ore was 407,670, the gross yield of which was \$16,825,851.86, and the net yield on which taxes are levied, was \$7,673,563.42.

The total amount of tailings was 335,352 tons, the gross yield of which was \$963,556.39, and the net yield on which taxes were levied, was \$140,613.55.

Total number of tons of ore and tailings was 743,023; gross yield, \$17,789,408.25; total net yield on which taxes are levied, \$7,814,176.97.

This exhibit for nine months is larger than the entire product of 1871. The *Enterprise* says:

Assuming that the last quarter of the year has given a yield equal to the average of the preceding three quarters, and the aggregate gold and silver product of the State reaches \$22,236,760.31. For a State with a population of but 50,000, this is doing well. The product is at the rate of \$444 for every man, woman and child in the State. The yield in 1871 was about \$1,000,000, which has been increased over \$4,000,000 in 1872. At the same rate of increase, the product of 1873 will be over \$26,000,000. This will place Nevada in the front rank of bullion-producing States.

The returns from Nevada for 1871 as prepared by Mr. Valentine, of Wells, Fargo & Co., amounted to \$21,177,046 in bullion; the product of 1872 from the same source, is set at \$25,548,821. As will be seen from the exhaustive report on the Washoe mines, from the *Gold Hill News*, in our "Mining Summary," everything in that locality is in a flourishing condition, and the production for the coming year promises to be immense. The lower levels of the prominent mines show large and rich deposits of ore. The ore developments in the Crown Point and Belcher are extensive, and seem to grow richer and larger as sunk upon. This being the case, all the other mines on the lode have good prospects of striking the same body. The Crown Point ore body which was found two years ago, is 120 feet wide on the 13th level, and its assaya average about \$150 per ton. It has been followed north and south in the two mines mentioned between 600 and 700 feet. The Crown Point mine paid in dividends this year, \$1,860,000, while the Belcher paid \$2,184,000, though the Crown Point ore body is the richest. Transportation and milling facilities have been temporarily interrupted at the Washoe mines, but now everything is running smoothly. Professor Clayton, a competent authority, estimates that the bullion yield of the Comstock lode this year will be not less than \$16,000,000.

Ely District

Is now only second to Washoe in bullion production on this Coast. The prominent mines and their characteristics are too well known to need much mention at this time, though it may be stated that it is estimated that the bullion yield of the Raymond & Ely alone will exceed \$4,000,000. It has paid about seven per cent. per month to its shareholders for some time past. Some considerable trouble is experienced in this district from bad titles and serious disputes have arisen from this cause. The hulkion shipments from the district are steady and heavy, principally from the Raymond & Ely and Meadow Valley mines. The *Pioche Record* has figured up the yield of the district at \$5,359,409.73, estimating the product of the last quarter at \$1,339,852.43. The gross yield of the mine for January 1st, 1871 to September 30th, 1872—21 months, is \$7,606,885.45. The figures compare as follows, the yield and increase for last quarter of the year being estimated:

	1871.	1872.	INCREASE.
1st. quarter.....	\$ 696,918.20	\$1,143,515.21	\$446,597.01
2d. ".....	615,316.55	1,459,353.93	844,037.38
3d. ".....	1,000,427.44	1,416,678.16	416,250.72
4th. ".....	1,276,065.96	1,339,852.43	64,786.47
Total.....	\$3,588,728.15	\$6,359,409.73	\$2,770,681.58

This shows an increase of nearly 50 per cent. on 1872 over previous year. The official figures show that the yield for the first nine months of the year 1872, exceed the total yield of 1870 by \$432,229.15. The *Record* makes the following peculiar estimate of the hulkion product.

Yield for 1872.....	\$5,359,409.73
" per month.....	446,617.47
" per week.....	103,065.57
" per day.....	14,723.65
" per hour.....	613.48
" per minute.....	10.22
" per second.....	.17

This is a very healthy showing, and the people of the district have cause for self-congratulation.

California Mines.

Without particularizing the districts in California, it may be said that they have enjoyed a season of prosperity, scarcity of water being the only drawback to our gravel mines, which has prevented a greater increase. The yield, as computed by Wells, Fargo & Co., is \$19,049,098. The placer mines are now reaping their harvest in this State, the late rains giving them the opportunity. As mentioned before, extensive hydraulic mines have been opened this year, which will help swell the product of the coming one. We will mention one quartz district alone for an example, and if each a showing can be made for this, many others are equally favored. The Grass Valley Union gives the following list of quartz mines actually at work in that district: Idaho, Coe, Eureka, Howard Hill, Empire, Greenhorn, Daisy Hill, Green Mountain, Jones, Slate Ledge (Perrin's), North Star, Independence Tunnel, Hunt & Talbot, Never Sweat, Knight of Malta, Sappho, Grass Valley Mining Company, Gahewill, Reese, Schuykill, Cedar, and others. In the way of gravel mines they have Town Talk, Independent, Enterprise, Phil Roberts & Co., Hope, Reuben Thomas, Dartmouth, Picayune, and others.

Utah

Has advanced this year more than any of the Territories. Her mines are doing well and large numbers of new ones have been found. Smelting furnaces and mills are being erected in every direction and thousands of tons of ore are being shipped away for reduction. She is wisely bringing her mining districts nearer to centers of population by a system of railroads and facilities for transportation are becoming greater every day. The amount of ore shipped from the Territory during the year 1872 was 10,347 tons and the amount of base bullion 5,653 tons. Value of silver bars \$6,000,000. This is what we learn by telegraph. Mr. Valentine estimates the yield of the Territory at \$3,521,020. Utah is fast taking a place in the front rank of bullion-producing regions and her prosperity is greatly increasing. The mining interests of

Colorado, Idaho and Arizona

Are prospering. In the latter place the Indian question being as yet unsettled, the mining districts are not so populous as they would otherwise be. Her ores are rich and abundant, and it has even been found profitable to ship them in considerable quantities all the way to this city for reduction. This is sufficient evidence of their value. The Indians being cared for as they should be, and Arizona becoming in that case a civilized place, we predict for her a most glorious future, as her mineral resources are known to be rich and varied.

The bullion yield of Idaho is set at \$2,514,090, and according to the Mint Director's annual report she has produced in all, exclusive of the latter part of last year the sum of \$17,141,523 in gold, since her mine was first opened. Colorado produced last year \$3,001,751. This Territory has suffered much for want of means of reduction and transportation, which, having been partially supplied, her prosperity is on the increase. We hear of new mines being opened, old ones more systematically developed, smelting works and mills being erected, and railroads built. This is sufficient indication of her prosperity without going into detail.

Mining Dividends for 1872.

During the year which has just closed thirteen mining companies paid dividends amounting in the aggregate to \$6,731,100. Belcher paid \$2,184,000; in January, \$104,000; in February and March, \$156,000; in April, \$208,000; and in May, June, July, August and September, \$312,000 each month.

The Cederberg mine paid three dividends: of \$12,000, or \$36,000 in all during the months of October, November and December.

The Chollar Potosi paid \$28,000 in January, and \$28,000 in February—\$56,000 in all.

The Crown Point paid \$1,860,000 in all; \$120,000 in January; \$180,000 in February and in March; \$300,000 in April; \$480,000 in May and \$300,000 in both June and July.

The Eureka paid \$40,000, of which \$20,000 was paid in January, and \$20,000 in December.

The Keystone Quartz paid \$30,000 during the year—\$7,500 in February; \$10,000 in March; \$7,500 in April, and \$5,000 in July.

The Mahogany paid \$15,000 in August.

The Meadow Valley mine paid \$360,000. Of this \$90,000 was paid in March and April, and \$60,000 in May, June and December.

The North Star mine paid \$27,000 in three dividends of \$6,000 each, during the first three months of the year.

The Pioche paid \$40,000 in two dividends of \$20,000 each—paid in July and August.

The Providence paid one dividend of \$3,100 in November.

The Raymond and Ely paid a total of

2,070,000 in eleven dividends—\$30,000 in January; \$150,000 in March; \$210,000 in April, May, June, July, August, September, October and November; and \$150,000 in December.

The Yale Gravel mine paid two dividends of \$5,000 each in April and May.

In 1871 there were dividends from eighteen Mining Companies. The amounts disbursed each month compare as follows:

	1871.	1872.
January.....	\$537,000	\$371,000
February.....	587,000	387,000
March.....	554,500	595,000
April.....	517,000	820,500
May.....	407,500	1,067,000
June.....	308,500	882,000
July.....	363,300	817,000
August.....	353,300	557,000
September.....	344,400	572,000
October.....	298,000	222,000
November.....	280,500	225,100
December.....	289,500	212,000
Totals.....	\$4,837,950	\$6,731,100

San Francisco University College.

This well-known institution, one of whose buildings is represented in the accompanying cut, is located on the corner of Geary and Stockton streets, in this city. The College was organized in 1859, in the basement of the old Calvary Church, which stood on Bush street, opposite the Cosmopolitan Hotel. It soon outgrew its accommodations there, and the present site on the corner of Geary and Stockton streets was secured. That part of the city was then in the "sand-hills," and the lot on which the College stands had a sand-bill on it nearly as high as the present college building.

The institution was for a long time known as the City College, and to many of the old patrons this is still the most familiar designation. In 1863, the charter of the institution was enlarged and its name changed to that of University College, probably after the example of University College of London. Its prosperity, from the first, has been one of the pleasant features of its history. It has not been without the trials and temporary reverses incident to similar institutions everywhere; but it has shown a vitality and vigor which entitles it to rank among the permanent institutions of the city and of the country. It possesses accommodations for at least five hundred students; is furnished with a laboratory and valuable philosophical and chemical apparatus, and an excellent telescope. It has a spacious yard in the rear, and an open-air gymnasium, for the exercise of students. There is no place in the city, or anywhere else on the Coast, where the mental, moral and physical welfare of boys and young men can be better promoted.

Under the Presidency of Rev. W. Alexander, aided by his efficient colleagues, the institution is rapidly attaining a high degree of prosperity in all its departments. It has extended its facilities so as to be in fact a University. It is the design of its Boards, both of Direction and of Instruction, to make it in all respects a first-class institution. Its plan is broad and comprehensive, providing for the entire education of youth, from the primary school up to the professional schools for Commerce, Medicine and Law. These various departments have been organized, and are now in successful operation.

The Pacific Medical College constitutes the Medical Department of the University. All information relative thereto will be furnished by Dr. Henry Gibbons, Jr., Dean of the Medical Faculty.

The City College—the Literary and Scientific Department, is under the more immediate supervision of the President, Prof. Alexander. He is aided by Professors Kirkland, Robinson,

Price and others of experience and high reputation. It is open to students of all grades, from boys of eight or ten years of age to young men in College. The new session commenced on Monday last, January 6th.

The Pacific Business College constitutes the Commercial Department, to which the whole east end of the building is devoted. This is the oldest and best Commercial School on the Coast, and the only one in which a thorough knowledge of business is taught. Business Colleges were for a long time regarded as a humbug; and it must be confessed that the prejudice was not without foundation. At first most of them were, and many of them still are, exceedingly superficial. Business-men found that young men who had passed through those Colleges had nearly everything yet to learn, while they sometimes had much to unlearn. Still, a want was felt for some means by which young men could be fitted for business pursuits, as they were for the so-called learned professions. By degrees the course of study was enlarged and made more practical and thorough, until now business-men can find in the halls of University College young men fitted for the store, the mill, the bank, the railroad or telegraph office, or any

business training. Such an institution is of great benefit to young men desirous of gaining speedy admission to business circles and promotion to responsible and lucrative positions; and the business men of San Francisco show that they feel an interest in the welfare of the young men of the Pacific Coast by affording them facilities for acquiring a knowledge of the customs and laws of trade and commerce under their own immediate sanction.

The Commercial Department enjoys the personal supervision of Prof. M. K. Lauden, who has had a large and successful experience in the management of business colleges, and as an expert accountant probably has no superior in the city. None but the most experienced and thorough instructors are employed, and young men who wish to acquire a thorough knowledge of business, will always find it for their interest to take a full course in the Pacific Business College. So little do most young men know of practical affairs who have even graduated from almost any of the colleges of the land, that they often find it necessary to take the business course afterwards.

For the convenience of those young men in the city who find it necessary to earn their own living, the college is open in the evening

Popular Lectures.

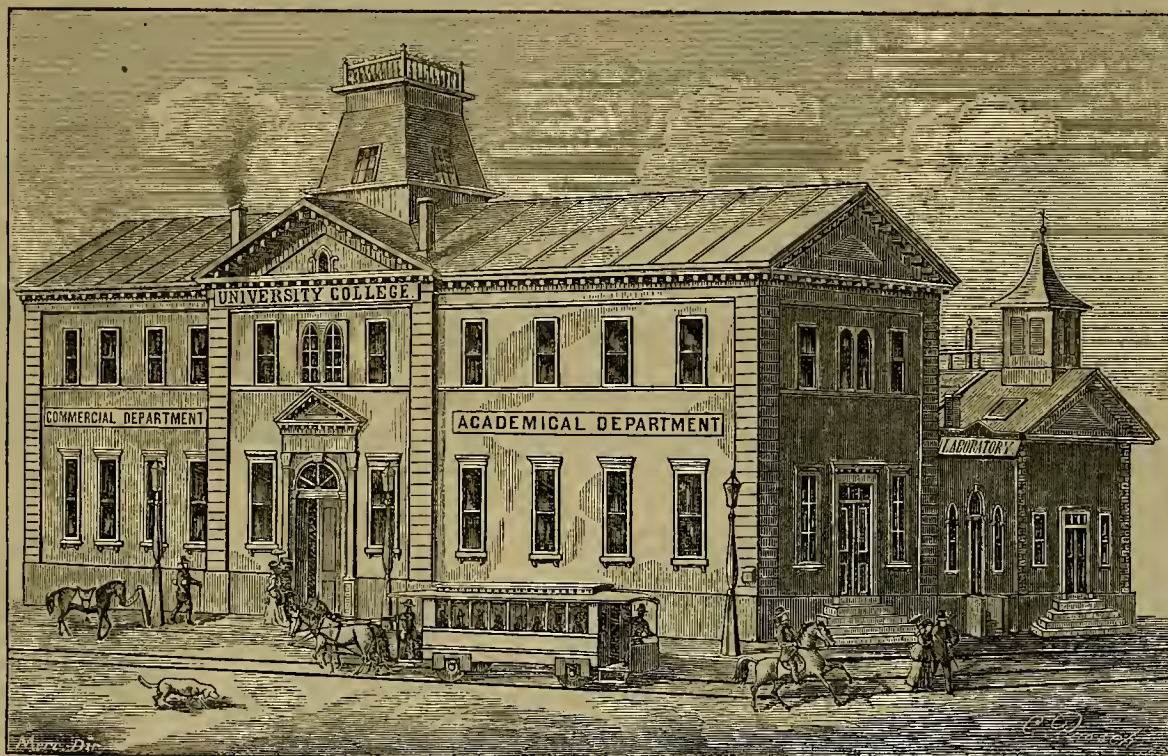
In another column will be found a synopsis of the first of the lectures which are to be delivered before the Mechanic Arts College, by the Professors of the State University. The President of the University, Prof. Gilman, seems already to be better posted on the requirements of the State, in an educational point of view, than many who have long resided here. His remarks possessed a local interest hardly to be expected from one comparatively a stranger in our city, for not only were the "Polytechnic schools of America and Europe compared," as was announced, but the special wants of California were considered. The choice of Professor Gilman as President of the University, we always thought a happy one, and he is fast proving his worth to the general community by his unceasing labors and interest in local affairs.

The lecture course of the past two years were eminently successful, and this one opens in a manner to leave no doubt but that the efforts of the Professors of the University and the Trustees of the Mechanics' Institute, to afford instruction in a popular manner, will be fully appreciated. The attendance was good,

and the audience attentive, the size of the hall alone preventing a great distribution of tickets.

A series of Thursday evening polytechnic lectures are to be delivered at the Mechanics' Institute Hall, in this city, this winter, the first of which will be given on Thursday, the 16th inst. The lectures are all upon matters of local interest. These lectures, in connection with the others now being delivered on Saturday evenings, by the Professors of the State University, will do a great deal of good in our community.

Popular lectures are doing much towards increasing the intelligence of the masses throughout the Union. Whatever affords means of instruction to any portion of a community benefits all the race.



UNIVERSITY COLLEGE, SAN FRANCISCO.

other department of practical business.

Among the men who are interested, as Trustees or patrons of this enterprise, and who recognize the importance of providing for the training of the future business men, merchants, and bankers of the country, no less than of the lawyers, doctors and clergymen, may be named, Hon. Thos. H. Selby, President of the Board of Trustees and Ex-Mayor of the city; Hon. H. P. Coon, an Ex-Mayor; Hon. H. H. Haight, Ex-Governor of the State; J. D. Thornton, Esq., of the law firm of Thornton & Williams; D. O. Mille, Esq., and W. C. Ralston, Esq., of the Bank of California; Rev. W. A. Scott, D. D. LL. D., of St. John's Church; Rev. John Hemphill, of Calvary Church; Rev. T. M. Cunningham, D. D., of the new Central Church Tabernacle; N. G. Kittle, Esq., of the firm of Kittle & Co.; A. Hemme, of Hemme & Rhein; Louis Sachse, of L. & M. Sachs, importers, etc., and many others of the most prominent men in the State and county.

The illustration herewith presented gives an accurate representation of the buildings, which occupy an entire 50-vara lot. The main building fronts upon Geary street, the left wing being appropriated to the Commercial and the right to the Academic department. Following the perspective down Stockton street, the laboratory is seen, which is a substantial brick building well-fitted for its purposes. Beyond that in the building surmounted by the smaller cupola is the Medical department.

Young men will here find a place where they may be sure that they will receive a proper

from seven till nine o'clock. Many young men complete the course in a few months by devoting their evenings to study. Boys who are too young for business, or who need some further instruction in English studies, or Modern Languages, can enter the Academic Department first and then take the business course when they are properly prepared for it. This is a practical age and country, and the place for obtaining a good practical education is in the Business Department of University College.

The College is without doubt one of the leading educational institutions of the city, and is deserving of the generous patronage it receives. Its Faculty and Trustees embrace in their numbers some of the ablest men in California; and its patrons include among them many of our most prominent and wealthy citizens. Prof. Alexander, the President, will be pleased to give any information that may be desired in relation to any of the departments. Persons wishing further information about the Business College can apply to the Superintendent, Prof. M. K. Lauden.

PLACER MINES.—We intend shortly publishing a series of very exhaustive articles on placer mines, from the pen of one fully competent to handle the subject well. The illustrations are now being prepared and we advise all interested to save copies of the papers containing the article, as it will be valuable for future reference.

THE Naval bill, as reported, appropriates \$18,884,993.

In this connection it may be mentioned that Dr. E. S. Carr, Professor of Agriculture in the State University, who has proved a versatile and popular lecturer, has received a call from a number of persons engaged in mercantile and industrial pursuits, through the columns of the *Oakland News*, to deliver a series of lectures in that city, on appropriate subjects. Professor Carr's activity in lecturing has already been productive of much good, creating a taste for such instructive amusement. We are sure he will deliver an interesting course of lectures which will be fully attended and appreciated.

SILVER COINAGE.—The Finance Committee of the Senate propose an important amendment to the bill "revising and amending the law relative to the mints and assay-offices and coinage of the United States," as it came from the House. This proposed amendment provides for a trade silver dollar of the weight of 420 grains troy; a silver dollar weighing 12½ grains, and a quarter dollar and dime respectively, one-half ounce and one-fifth the weight of the 50 cent coin. A correspondent of the *Bulletin* has been informed by the Comptroller of the Currency that this increases the weight of the existing coinage one-half of one per cent. The present silver dollar is abolished and the "trade dollar" of 240 grains is authorized, and is slightly in excess in weight of the Mexican dollar.

SAN DIEGO FOUNDRY.—The first run of metal at the new foundry at San Diego, was made on the 8th, very successfully.

DOMESTIC ECONOMY

Table Use of Oatmeal.

Oatmeal Breakfast Cake.

This is made of No. 2 oatmeal, with water enough to saturate it, and little or no salt. Pour it into a baking tin half an inch or three-quarters deep, shake it down level, and when this is done it should be so wet that two or three spoonfuls of water should run freely on the surface. Put it in a quick oven and bake twenty minutes. Eat warm. It will be as light and tender as the best "Johnny cake," or else you have wet it too much or baked it too long. This is one of the most accommodating baked dishes that can be made. It will do very nicely with a little longer time if the oven is not quite hot. If it will not bake there at all, pour it into a frying pan, cover it close and set it on the top of the stove where it will even bake in fifteen minutes.

For a hurried breakfast and a slow coal fire it is invaluable. Scarcely any wholesome thing in the whole bread line can be prepared more readily. It can be made still thinner and baked quicker. It is good either crisp or moist. For emergencies alone every housekeeper will find it convenient to be able to make the breakfast cake. Many use oatmeal mixed with buckwheat, wheat or corn for griddle cakes. For this use I prefer it cooked first. Take say one-half pint of the porridge or the mush, diffuse it in one quart of water and add the wheat meal, sifting it in and stirring slowly.

Oatmeal Pie Crust.

A long trial proves the thorough adaptability of oat meal for that purpose. Take No. 1 meal, if possible, wet with half its measure of hot water. It can be easily rolled thin enough; it will swell but little in baking. It is not so white as those pie crusts made of white flour, and to the unaccustomed eye not so attractive, though that is a matter of taste. To my notion they are far preferable, even in appearance to the crusts soaked in hog's lard, which here in the city have earned themselves the suggestive sobriquet of "scabs," and they are certainly far more wholesome than any shortened pie crusts whatever.

To avoid the unaccustomed appearance, however, tarts, pies, and fruit and berry pies of many kinds can be without the upper crust or the upper crust can be removed after baking. Blackberry, raspberry, plum, peach, grape and many other kinds of pies can be made in this way. The crust bakes very quickly, so that any kind of fruit that requires much cooking should be cooked before it is put in. It also makes very pretty ornaments cut in various shapes with cake cutters, and laid upon the surface of tart pies; is agreeable to the taste, and very few persons would notice the difference when made without an upper crust. As people come to recognize its wholesomeness they will probably be brave enough to eat it openly.—*Science of Health.*

Beef Soup.

A correspondent of the *American Rural Home*, says: "I have eaten beef soup at some houses where it would be watery and tasteless, evidently containing no vegetable but potatoes, and with little seasoning, which mixture I never could relish. But this is only a counterfeit of the genuine beef soup which is a delight to the epicurean. The way to make it is thus:

"Take a small joint of beef, (one which can be purchased for a shilling or fifteen cents is large enough,) and put in a kettle containing about four quarts of water—rain water is best if it can be obtained pure. Be sure to put it in while the water is cold, then put it over the fire, and let it boil for three or four hours. Then take about eight good sized potatoes, four parsnips, two carrots, six or eight onions, and a small cabbage; after paring the potatoes and onions, and scraping the parsnips and carrots, chop the whole together, adding a little summer savory if it suits the taste, and put it in the kettle to cook. If rice is preferred for thickening it must be boiled by itself and then added to the soup; but instead of rice, the white of an egg rubbed in flour until it crumbles into small pieces, is thought best by some; either is good. Soon after the vegetables are put in, add the salt and pepper, and let it all cook an hour longer, when it will be ready to serve. If any of the vegetables mentioned should be distasteful to one of the family it can be omitted, putting in more of another kind, if thick soup is desired."

IRONING WITHOUT HEAT.—A lady of experience says that much time and trouble may be saved by "ironing" without heat and flatirons. When rinsing the cloths, fold coarse sheets, towels and table cloths in the shape they are wanted, and pass them through the wringer as tight as possible. Unfold and hang to dry where the wind does not blow very hard. They will need little or no ironing. The table cloths should be dipped in old, sweet, skimmed milk; this gives them a luster, and they need no starch.

CUCUMBER SAUCE.—An excellent sauce may be made by cutting a cucumber and onion as small as millet seed, and adding a teaspoonful of cayenne pepper, a wine-glass of Madeira, the same of vinegar, and a little salt.

Resources of Utah.

The following is the first installment of a valuable series of articles, from the Salt Lake Tribune, which our readers would do well to preserve to mail to their friends. It will shortly be followed by others, which will extend through several numbers of the Tribune:

FURNACES, SMELTING WORKS AND STAMP MILLS.

BADGER STATE WORKS,

On State Road, south of Salt Lake City, built in the spring of 1871; one blast; capacity, fifteen tons per day; ores treated from Little Cottonwood, Parley's Park and Bingham cañon; A. Robinson, proprietor.

WASATCH SMELTING WORKS,

On the U. S. R. R., seven miles south of Salt Lake City; incorporated in New York; capital, \$100,000; two blasts and one reverberatory; capacity, forty-five tons per day, to work custom ore; R. P. Lounsbury, Treasurer.

W. & M. ROBINS' SMELTING WORKS,

On State Road, seven and a half miles south of Salt Lake City, at Little Cottonwood creek completed May, 1871; has one calciner; capacity fifty tons per day for high grade ores; also one reverberatory.

SATURIN MINING COMPANY,

(Limited.) Sandy Station, on U. S. R. R., fifteen miles south of Salt Lake City; incorporated in England; capital, £75,000; has three cupola blast furnaces, six feet Sturtevant blower, No. 9; thirty horse power engine; capacity, twenty tons per day each furnace; two in constant operation; engine and furnaces under one roof; cost of furnaces and buildings, \$20,000; location admirable; all ores smelted are purchased in market; have lately been working ores from the Emma, Vallejo and Winsor Mining Companies. In twenty-six days immediately preceding the 18th of December, 1872, the works turned out 365 tons of bullion, equal to fourteen tons per diem. The average quantity of silver to the ton in the above batch was 160 ounces. G. M. Gerrish, Superintendent.

FLAGSTAFF SILVER MINING COMPANY,

(Limited.) incorporated in London, capital, £300,000; two furnaces, capacity, ten tons each per day. Situated at mouth of Little Cottonwood Cañon; built by Buel & Bateman in 1870; a third furnace building; working Flagstaff ores. J. A. H. Patrick, Superintendent.

WELLINGTON MINING AND SMELTING COMPANY,

Little Cottonwood; one furnace, capacity, eight tons per day; built by Jones & Pardee, sold to Wellington Co., incorporated in San Francisco, January, 1872; ore worked, Wellington mine and custom; approximate production by company, 110 tons of bullion; value, 225 ounces, of silver, gold and lead, \$350 per ton. R. Y. Andersou, Superintendent.

MONITOR FURNACE,

Union Fort, mouth of Little Cottonwood; built in 1871; T. R. Scheuner, proprietor; patent force blast smelting furnace, capacity, 10 to 15 tons per day.

UTAH SILVER MINING COMPANY,

(Limited.) Bingham Cañon; incorporated in London; two furnaces, one of the capacity, of 15 tons per day, the other 30 tons per day, and two roasters each 35 feet long; ore worked from the Red Warrior, Portland and other mines. J. R. Murphy, Superintendent.

WINAMUCK COMPANY,

Bingham Cañon; two furnaces, capacity, eight tons per day each; erected by a company from New Haven, Connecticut; Daggett and Bristol, Superintendents.

SULTANA SMELTING WORKS,

American Fork Cañon; three furnaces, two built in 1871. Ore worked from the "Miller" mine; bullion at first, sixty-seven ounces per ton; later, one to one and a half ounces gold in addition; lead pure; Edmund Wilkes, Manager.

UTAH SMELTING AND MINING COMPANY,

Homansville, Tintic District; incorporated in Utah; capital, \$30,000; completed June, 1871; two furnaces; capacity, twenty tons per day each; working ore of Scotia mine, West camp, Tintic District; production, 1,200 tons of bullion; average, 125 ounces silver and one and a half ounces gold per ton; Joah Lawrence, President; T. S. Clarkson, Treasurer.

TINTIO SMELTING COMPANY,

Diamond City; completed October, 1871; built by Hopkins, Parsons & Co.; two furnaces; capacity, twenty tons per day; treating ore from the Shower mine; Charles Pointer, Superintendent.

WATERMAN SMELTING WORKS,

Stockton; two cupolas and blast, completed May, 1871; work ore from Hidden Treasure, (St. Louis) from Dry Cañon, and St. Patrick, Grand Cross and Metropolitan, Stockton mines; about 330 tons of bullion, average 120 oz. silver per ton. Superior lead. Isaac S. Waterman, Philadelphia, proprietor; Henry Simmons, manager.

OPHIR UPPER SMELTING WORKS,

East Cañon; built by Mr. Raymond in the fall

of 1870; two cupola blast, capacity twenty-five tons per day; ore worked from Sevier, Last Chances and other mines in Ophir district; about 200 tons of bullion in the last six months. Isaac S. Waterman, of Philadelphia, proprietor.

OPHIR MINING AND SMELTING WORKS,

East Cañon; incorporated in Utah; one furnace completed July 4th, 1871; one building; capacity, fifteen to twenty tons per day; working Fairview and other mines; one run of forty tons of bullion averaged \$165 to the ton; E. J. Ryan, superintendent.

UTAH MINING AND SMELTING COMPANY,

East Cañon, incorporated in London, England; capital stock \$500,000; steam jet furnace, completed June, 1872; capacity, fifteen tons. Intention to build large mill, reduction and smelting works. Mines to be worked: Miner's Delight and other claims. E. S. Blackwell, manager.

H. S. JACOBS & CO.,

Stockton, Tooele County; three blast furnaces; engines forty-horse power; capital \$200,000; to work ores from Dry Cañon and Stockton mines, Rush Valley District. H. S. Jacobs, manager, and H. S. Durkse, assistant.

GILBERTSON & BERRY'S,

Deep Creek, built 1872; one furnace; thirty tons bullion sent to Salt Lake City averaged \$93 silver per ton.

WARM SPRINGS SMELTING WORKS,

Salt Lake City, built in 1870; one blast and reverberatory; capacity, twenty tons per day; ores worked from Little Cottonwood, East Cañon, Parley's Park and Bingham Cañon; F. J. P. Pincose, proprietor.

REGISTER SMELTING AND REFINING CO.,

Ogden; one furnace; built in fall of 1871; ore worked from East Cañon mines; Mr. Purnall, manager.

ALGER REDUCTION WORKS,

Corrinne; built in 1871; Henry Sanger, proprietor.

STAMP MILLS.

PIONEER MILL, WALKER BROS.,

East Cañon, fifteen stamps, power for twenty-five; capacity, twenty-five tons per day, dry crushing; erected July, 1871; Aiken furnace just completed, same capacity; ore chloridized to 86½ per cent.; first run Tiger ore, thirty days produced \$33,000; silver bars, .991 to .997 fine. Working ore from Tiger, Zella, Rockwell and other mines. Lion Hill cost about \$60,000. Lathrop Dunn, Superintendent.

EUREKA MINING COMPANY OF UTAH,

Homansville, Tintic District; incorporated in Utah, capital \$500,000; twelve stamp; capacity, twenty-four tons per day. Working ores from the company's mines, Eureka Hill. Joab Lawrence, President.

BREVORT MILL,

East Cañon; steam battery; capacity ten to twelve tons per day, custom ore.

CHICAGO COMPANY'S MILL,

Ohio District, near Sevier river; steam battery, capacity six to eight tons per day; working ores from the company's mines.

CAMP FLOYD SILVER MINING COMPANY, (LIMITED.)

Incorporated in London, England; capital, £120,000; twenty-stamp mill, thirty tons per day capacity; power and machinery for thirty stamps; a forty ton Aiken roasting furnace; treat ores from Sparrow Hawk, Last chance and Marion mines belonging to the company. E. H. Shaw, Managing Agent; E. B. Wilder, Superintendent.

MINERAL RESOURCES.

The mineral resources of Utah are extraordinary in their diversity and extent, and afford an inexhaustible field for enterprise worthy the attention of science and capital. Among them are the ores of all the principal metals, together with many of the rarer minerals.

GOLD

Is found in several districts, both in the form of gold quartz, in placer mines, at Bingham Cañon, and more or less associated with the argentiferous galena of the Territory, especially in the ferruginous ores of Big and Little Cottonwood and Bingham Cañons.

SILVER

Is found in the native state, but not in large quantity. In its various ores, however, it occurs almost all over the Territory, associated with other ores, such as those of copper, lead, antimony, arsenic, etc. It occurs in small quantity in the form of dark ruby silver, (antimonial sulphuret) and light ruby silver, (arsenical sulphuret) at Butterfield and Black Jack Cañons in the Oquirrh range of mountains; as horn silver, chlorobromides and iodides, in East Cañon, Dry Cañon, Tintic and in the Star, Sevier and other districts in Southern Utah. In combination with lead it is broadly distributed over the Territory, especially in the Cottonwood and Stockton Districts. It is found with copper at Tintic, Star District and the northern part of the Territory

LEAD

Is widely disseminated, being found in the form of argentiferous galena and carbonate of lead in nearly all the mining districts of the Territory, and occurring in large bodies in the Cottonwood, Bingham, Stockton and Lake Side Districts, notable in the celebrated Emma, Wellington, Flagstaff and other mines in Cottonwood, and in immense bodies, though en-

riching less silver in Bingham Cañon and Rush Valley. It occurs chiefly as carbonate of lead, as sulphate of lead (antimonial, arsenical, cupiferous, and argentiferous). In small quantities as sulphate, sulphate-carbonate, chloro-arsenate and chloro-phosphate of lead.

COPPER.

Ores of copper, though hitherto not much sought after, are abundant throughout the Territory. Copper is found in the native state in small quantities at Ophir, Tintic, and in Southern Utah, but it occurs chiefly as malachite, azurite (green and blue carbonates) silicate of copper, vitreous copper ore (sulphuret) and peacock ore. Ruby copper (sub-oxide) is found at Bingham Cañon whence also a considerable quantity of native copper has been panned from the creek. Most of these ores contain silver in variable proportions and some also carry gold; the ore from the Mammoth Copperopolis mine at Tintic containing considerable gold. Some of the specimens of azurite and malachite constitute the most beautiful of Utah's minerals, some of the pieces of malachite comparing favorably with that found in the Ural mountains in beauty and only wanting in size.

IRON ORES

Are very plentiful and of excellent quality, covering a large portion of the Territory. Excellent hematites are found in the South, also in Cottonwood cañon, and Skull and Rush valleys; good iron ores are also found in Weber and Cache valleys, and Iron and Washington counties. Magnetic iron ore is found in the Cottonwoods and also associated with Spathe iron in Rush valley. Smelting operations, on a limited scale, were about four years ago commenced in Iron county, but owing to the want of superior fuel, reduction was discontinued, but has since resumed. A fine quality of micaceous iron ore is found in Cache county.

BISMUTH ORE

Is found in Beaver District, but not sufficiently rich to pay for reduction with previous concentration. Sulphide of cadmium also occurs with it.

CINNABAR

Is found at Camp Floyd, and realgar and orpiment in a very pure form in Black Jack Cañon in the Oquirrh Range. The sulphuret of antimony, which is the principal ore from which the metal is extracted, is found here in considerable quantity.

PYROLUSITE

(Peroxide of manganese) is associated with several different minerals in Provo, Snake Creek, etc., while graphite, black lead, native sulphur, and especially iron pyrites, alum, borax, nitrate of potash, sal ammonia, carbonate of soda and gypsum are disseminated over the Territory.

COMMON SALT

Exists in enormous quantities, the lake itself being an immense reservoir from whence very large crystals can be had, and large bodies of rock salt are found in the south, one variety being tolerably pure and available for diathermal purposes.

MARBLE.

Fossiliferous lime stones (bird's eye and figured marbles), from Provo Valley, and other parts of the Territory have been worked to a limited extent. Quartz crystals occur, frequently in clusters, both colorless, amethystine and different shades of brown.

OF VOLCANIC PRODUCTIONS

There are nimple remains, as witnessed by the porphyry, trachyte, lava, pumice, and obsidian contained in Utah. Some beautiful specimens of obsidian have been found which might almost rank with gems, and among them might be placed chrysocolla, opals, chalcedony, onyx, and a host of other beautiful minerals too numerous to mention. Asbestos, fuller's earth, and petroleum have also been discovered. Among gems proper, have been found rubies, (the large ones inferior to the smaller,) beryl, and white topaz.

With the continued development of the resources of the Territory, new treasures will doubtless be discovered in Utah. The foregoing statement is of itself sufficient to prove how seemingly inexhaustible is the hidden wealth of this country.

COAL,

Said to be of good quality, is found in various parts of the Territory, and has been worked for some time past in Weber Cañon. It is generally lignite, but the coal found at San Pete is bituminous, and yields a superior quality of coke. From recent developments, the southern portion of Utah appears to be well supplied with coal—a most important item in a smelting and manufacturing district.

FIRE CLAY

Of a superior description is raised a short distance north of Salt Lake City; Mr. Pincose being the proprietor of the bed, while in Bingham cañon are large deposits of fire-clay, owned by Mr. Cotton, Messrs. Morris & Evans and others. A species of quartzite or sandstone, found in Red Butte cañon, near Camp Douglas, within a few miles of Salt Lake City, is also owned by the last-named firm, who supply for the erection of blast furnaces; and from competitive trials of well-selected stones, with the firebrick used in Utah, it bears a good comparison. Clays, suitable for pottery-ware, abound, and in the neighborhood of Ogden and of San Pete; Kaolin, for china-ware is plentiful; building

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—AND—
Chemical Apparatus,
Having been engaged in furnishing these supplies since
the first discovery of mines on the Pacific Coast.
Our Gold and Silver Tables, showing the value
per ounce Troy at different degrees of fineness, and val-
uable tables for computation of assays in Grains a
Grammes, will be sent free upon application.
7v25-1f JOHN TAYLOR & CO.

To Mill Men and Miners.
I am now manufacturing
CYANIDE OF POTASSIUM,
Which I can sell upon better terms than any other
dealer on the Pacific Coast.
I make three grades or qualities to suit the require-
ments of different consumers.
I will be glad to furnish prices to any person ad-
dressing me on the subject.
HENRY G. HANKS,
Manufacturing Chemist,
PACIFIC CHEMICAL WORKS, SAN FRANCISCO
24v25-1f

LEA & PERRINS'
CELEBRATED
Worcestershire Sauce.
Declared by Connois-
seurs to be the only good
SAUCE
Caution Against Fraud.
The success of this most
delicious and unrivalled
Condiment having caused certain dealers to
apply the name of "Worcestershire Sauce"
to their own inferior compounds, the public
is hereby informed that the only way
to secure the genuine is to ask for LEA &
PERRINS' SAUCE, and see that their names
are upon the wrapper, labels, stopper and
bottle.
Some of the foreign markets having been
supplied with a spurious Worcestershire
sauce, upon the wrapper and labels of which the names
of Lea and Perrins have been forged, L. and P. give
notice that they have furnished their correspondents
with power of attorney to take instant proceedings
against manufacturers and vendors of such, or any
other imitations by which their right may be infringed.
Ask for LEA & PERRINS' Sauce, and see name on
wrapper, label, bottle and stopper.
Wholesale and for export by the Proprietors, Worces-
ter; Cross & Blackwell, London, &c., &c., and by
Grocers and Oilmen universally. 15v24-1f

L. SCHUMANN,
PIONEER
Meerschium Pipe Manufacturer,

No. 341 KEARNY STREET,
Between Bush and Pine streets, San Francisco
The first and only Manufactory on the Pacific Coast.
MEERSCHAUM MOUNTED WITH SILVER. Meerschium
Pipes Bored and Repaired. Amber Mouth-pieces Fitted.
Betts's Capsule Patents.
To prevent infringements, notice is hereby given, that
Betts's name is on every Capsule he makes for the principal mer-
chants in England and France,
thus enabling vendor, purchaser, and consumer not only to
identify the genuineness of the article, but also to know
the contents of the vessel to which it is applied.
The LORD CHANCELLOR, in his judgment, said that the
capsules are not used merely for the purpose of the con-
tents, but that they are serviceable in protecting the wine
from injury, and insuring its genuineness.
MANUFACTURERS:—1, WHARF-ROAD, CITY-ROAD, LON-
DON, AND BORDEAUX, FRANCE.
SELL YOUR PATENTS
Through WEBSTER & Co., 17 New Montgomery street,
SAN FRANCISCO, CAL.

PATENTS & INVENTIONS.

Telegraphic List of U. S. Patents Issued to Pacific Coast Inventors.

REPORTED OFFICIALLY FOR THE MINING AND SCIENTIFIC PRESS, DEWEY & CO., PUBLISHERS AND U. S. AND FOREIGN PATENT AGENTS.]

By Special Dispatch, Dated Washington, D. C., Jan. 7th, 1872.

SEWING-MACHINE.—John H. Mooney, S. F., Cal.

ORE-CRUSHER.—William P. Hemmond, as signor to himself and Henry Mygett, Napa, Cal.

LOADING AND UNLOADING WAGONS.—Richard Threlfall, Centerville, Cal.

STEAM BOILER.—Frank A. Huntington, S. F., Cal.

CUTTING TOOL FOR TURNING LATHES.—Charles Rahskopf, S. F., Cal.

FEATHERING PADDLE WHEELS.—John Ch. H. Stut, S. F., Cal.

DEVICE FOR LUBRICATING SHAFT BEARINGS.—Jerome Haas, Stockton, Cal.

The patents are not ready for delivery by the Patent Office until some 14 days after the date of issue. Note.—Copies of U. S. and Foreign Patents furnished by DEWEY & CO., in the shortest time possible (by telegraph or otherwise) at the lowest rates. All patent business for Pacific coast inventors transacted with greater security and in much less time than by any other agency.

California Academy of Sciences.

The annual meeting of the Academy was held on the 6th inst., President George Davidson in the Chair. The attendance was large and considerable interest was manifested in the affairs of the Association. The membership of the Academy is now larger than it has been since its foundation, and the financial affairs are in a more prosperous condition. The only drawback at present is the impossibility of displaying the extensive collections, on account of want of space. More room is necessary but at present the Academy is not able to change its quarters.

The following new members were elected: S. B. Boswell, C. P. Morgan, Theodore A. P. Brown, Dr. P. Hatch and Robert M. Brereton (life member.)

Annual Reports.

The report of the Curator of the Museum, Mr. H. G. Bloomer, was read and contained a full list of the donations received during the year, with the names of the donors.

The report of the Treasurer, Elishe Brooke, showed the total income of the year to be \$2,702.35; expenditures, \$1,133.90; balance on hand \$1,568.45.

The report of the Curator of Entomology, Harry Edwards, was an elaborate document, and contained an account of the progress made in entomological research on the Pacific Coast, and what was being done elsewhere.

Dr. C. N. Ellinwood, the Librarian, made a few remarks on the condition of the library.

The President's Address.

Professor Davidson then delivered his annual address, from which we make a few extracts, as want of space forbids our giving it in full:

In the last few years our balance sheet, at the annual meeting, generally showed a minus quantity, even after the most rigid economy and self-denial. If a few dollars surplus was discovered, the members indulged in sanguine congratulations and bright visions of the future. But for the last twelve months our financial exhibit is more favorable than we dared hope, the Treasurer's account showing a balance of over \$1,500 in our favor.

Excellent Influence of Agassiz.

A livelier interest has been awakened among our citizens having scientific instincts, and willing to aid us by their membership and encourage us by their attendance. This healthy manifestation was very notably developed by the presence of Professor Agassiz, who arrived from his natural history voyage around the Americas, and exhibited, as he felt, the liveliest interest in our efforts. That he fully appreciated the labors of the Academy is shown by the fact that he had the whole of one volume of our proceedings transcribed because there was but a single copy of that volume belonging to the library.

His stirring appeal in behalf of science at the reception given to him by the Academy, aroused the dormant desire for scientific study and investigations, and we trust that our efforts will steadily maintain it. In the last twelve months, 78 resident and corresponding members, and eleven life members, have joined the Academy; and by death, resignation and non-payment of dues we have lost 29. But of those dropped for non-payment of dues, so many date back for three years that only one-third of the above can really be charged to this year.

Suggested Change in the Library.

In one respect the Academy is sadly deficient. Its library is small, very far from full, not well arranged, and requires systematic cataloguing. Much material collected on the Coast cannot be described for want of works of reference,

end of necessity must wait description or identification, or, as I have said, when the credit comes to others. Where we cannot secure books by exchange, it is indispensable to our success that we purchase, and yet the means at our disposal will not permit this beyond the most restricted limits.

How to Maintain the Reputation of the Academy.

But we are now in a condition where success seems assured, if we but continue our efforts. To maintain our claim as a scientific body, I earnestly appeal to each and every one in his specialty to make a resolution unto himself, that he will furnish not less than two papers of original investigations during each year. This will insure more than one paper of interest at each meeting, besides the usual verbal and short communications. Many of these papers will necessarily have important bearings upon the material interests of the Pacific States. The forests, the fisheries, the mines, the agriculture, the manufacture and commerce of the country afford ample fields for technical investigation, leading to the best practical methods of production and development. In no department of art and manufacture, agriculture and commerce, can the most profitable results be obtained except through purely scientific investigations and deductions, and it is our duty, as it is our pleasure, to demonstrate its ultimate practical money value, if we seek support from those who reap the rewards without the labor. The enormous waste of material, of labor and of time seen in nearly every workshop and manufactory, in every locomotive and steamship, in every mine and work of improvement, prove that scientific knowledge and method are lacking. When the valleys have been overtaxed and the impoverished soil yields a bare livelihood, the teachings of chemistry will be sought and must be heeded to make them again remunerative; when the forests have been depleted—as they are being at the rate of hundreds of square miles per year on this coast—the botanist will be asked to designate the best trees to replace those destroyed. With proper methods we need not ship any of our ores to the East or to Europe for reduction.

It is gratifying to the Academy to know that some of the papers read during the year have been largely copied abroad in advance of our regular publication not only for their scientific but for their practical value. And we may be proud that two of our active members are editing such works as *Stretche's Illustrations of the Zygocida and Bombycidae of North America*, and *Scammon's Natural History of the Cetaceans and other Marine Mammals of the Pacific Coast of America*.

Question of Finance.

But a practical question stares us broadly in the face—the financial success of the Academy. We need room to properly exhibit to the members and to the public our present collection and its prospective additions; we need a larger number of scientific works and the proper means of keeping them; a good supply of the current literature of Europe and the East; means and facilities for investigations.

We need funds sufficient to make some remuneration for the services of Curator of the Museum, Librarian, Secretary, Janitor, etc., and for the publication of our proceedings. Our present receipts will warrant us in seeking more commodious quarters, but nothing more. The Trustees have had these matters seriously at heart, and have received the opinions of many of the members. For some months they have been engaged in seeking for a larger and better building, but thus far with no success. To merit the confidence and an increased liberal support of our friends outside the Academy, the members must make the proceedings of each meeting instructive, and therefore interesting and attractive.

Election of Officers.

The Academy then proceeded to the election of officers for the coming year, the result being virtually unanimous. President, Prof. George Davidson; Vice-President, John Heuston, Jr.; Treasurer, Elishe Brooke; Corresponding Secretary, Henry G. Hanks; Recording Secretary, Charles G. Yele (of the MINING AND SCIENTIFIC PRESS); Curator of the Museum, H. G. Bloomer; Trustees, Robert E. C. Stearns, D. D. Colton, T. P. Madden and Oliver Eldridge; Librarian Dr. C. N. Ellinwood. Messrs. Davidson, Brooks and Yale are ex-officio Trustees.

Dr. Stont presented an interesting paper on the chemistry of great fires, which want of space prevents our publishing.

Meetings and Elections.

THE MINERS' PROTECTIVE ASSOCIATION have elected the following officers for the ensuing six months: President, A. N. Nelson; Vice-President, Wm. Sievers; Treasurer, Henry Meyers; Recording Secretary, Jason D. Wheeler; Financial Secretary, H. H. Subling; Trustees—Henry Scherling, Wm. O'Brien and Robert Parks.

GOLD & CURRY M. Co., Trustees—James G. Fair, Wm. S. Lyle, L. S. Rose, Geo. Congdon, Robert Sherwood, Edward Barron and J. C. Flood (President); Robert N. Graves, Superintendent; A. K. Durbrow, Secretary. The stock of this Company has been increased from \$2,400,000, in 4,800 shares, to \$4,800,000, in 9,600 shares, of \$100 each. The Secretary's report for the past year showed the receipts of the Company to have been \$378,644, mainly from assessments and the disbursements, \$342,795. Total assets, \$150,947, against \$706 liabilities. CAMERON OLD M. Co.—Dec. 26th. Trustees—A. W. Whitney, J. Clem Uhler, Samuel D. Kreider, Wm. H. Ashton and Alex. Cameron. President, J. Clem Uhler was elected President; Alexander Cameron, Superintendent, and Frank L. Kreider, Secretary.

COE M. Co.—William Blanding, President; J. H. Stevens, Vice-President; O. A. Treadwell, Treasurer; A. Treadwell, Secretary, and J. L. Hull, Superintendent. ANGELO M. Co.—Jan. 3. William Blanding, President; C. J. Alex. Cameron, Vice-President; G. A. Treadwell, Treasurer; A. Treadwell, Secretary.

Alta White Lead Works.

New Process for the Manufacture of White Lead.

Last week, by the kind invitation of the President of the above works, Mr. Otto Kloppenburg, we accompanied him on a visit to the extensive manufactory which this Company has just erected in the Visitacion Valley, on the shore of San Francisco bay, and nearly opposite the Six Mile House, on the San Bruno road.

The building is large and evidently well adapted for the purpose for which it was intended. The size of the main structure is 150 feet in length by 50 feet in width, besides which, there are other sheds connecting with the larger edifice.

Mr. C. C. Rueger, the Superintendent, took us over the premises and explained the different uses of the machinery employed in the manufacture of white lead.

One of the most novel features in this establishment is the furnace, which is on an entirely new principle, and is so constructed that it consumes the greater portion of its own smoke, while the residue and the gases from the other furnaces are conveyed by underground pipes to the smoke stack which is on the outside of the building.

The drying rooms are two in number, and consist of two systems of endless bands running over rollers so arranged as to carry the material from the washing tanks, and after discharging it from one set of hands to the other, finally empties it into a conveyer which then carries it into the mill, where it is ground with oil and rendered fit for market. Between the endless hands a system of steam pipes are introduced which gradually dry the lead. The water of condensation is then carried back into the boiler, thus saving considerable fuel and labor of pumping.

In one portion of the building is erected a smelting stove, which is capable of granulating 16 tons of lead daily. This lead is then placed in earthen towers, filled from the top of the building. The acid (nitric) is then poured on the mess, and passing down collects in tanks, where it is precipitated, then washed, and finally run off into the drying rooms.

The soda room adjoins this portion of the establishment, and in this department the soda used for precipitating the white lead is dissolved and cleaned.

This factory (the first of its kind in the world, the principle on which the white lead is produced having been invented by Mr. Frederick Victor) has been built by an enterprising and sanguine company of five gentlemen who are persuaded that they will succeed in their project, which is nothing less than to produce white lead for the whole Pacific Coast at a cost greatly below that now ruling, for an inferior article in New York. They state they are able to manufacture (with the machinery now in use) from 5 to 7 tons of white lead per diem. If they can do this (and there seems to be little or no doubt of it) their success is an established fact. Anyhow, it is a California production, and as such, born with the New Year, we wish it joy and the compliments of the season. Below are a list of the officers.

President, Otto Kloppenburg; Secretary and Treasurer, C. M. Gerichten; Superintendents, C. C. Rueger and Frederick Victor; Trustees, Otto Kloppenburg, Joseph Fredericks, C. C. Rueger, Frederick Victor and C. M. Gerichten.

Silk at Calistoga.

Mr. R. Bonhomme the lessee of the fine mulberry plantation of Sam. Brannen, Esq., at Calistoga, is making all needful additions, alterations and improvements to the buildings to be used the coming spring for the growing of silkworms. It is the intention of Mr. Bonhomme, to demonstrate the entire practicability of silk growing in that locality as a paying industry, and we believe if any man can do it he will.

We hope, however, as the surest guaranty of success, that he will commence the feeding as early in the spring as it will be possible for him to obtain leaves; for we have no faith in attempting to grow silkworms successfully in the low, hot valleys of the State after the middle of May. In no country in the world is the growing of the silkworm made successful through the entire season, and why it was over conceived that California could be made an exception to the rule, and grow worms in the heat of summer, we never could understand. We wish Mr. B. complete success.

ROSS BROWNE BEFORE THE FARMERS.—Mr. J. Ross Browne will address the Oakland Farming Club, Friday evening, January 10th, on the Agricultural Interest of California, including Irrigation and Swamp land Reclamation. The annual election of officers of the Club also occurs on the same evening. All lectures and meetings are free in this Club.

Leather Market Report.

[Reported for the Press by Bulliver & Co.]

SAN FRANCISCO, Tuesday, Jan. 8, 1873.
Shipments of Sole Leather to the East are quite heavy, and prices are firm, though there has been no advance. Domestic Calf Skin has advanced 10 per cent., in consequence of the large amount destroyed, and French Skins are firm with an upward tendency.

City Tanned Leather, 3 B.	28 00	29
Santa Cruz Leather, 3 B.	28 00	29
Country Leather, 3 B.	28 00	29
Stockton Leather, 3 B.	28 00	29
Jefferies 8 Kill, per doz.	60 00	85 00
Jefferies 11 to 15 Kil, per doz.	55 00	70 00
Lemoine, 12 to 15 Kil, per doz.	75 00	77 50
Levin, 12 and 13 Kil, per doz.	83 00	70 00
Cornellian, 16 to 19 Kil, per doz.	63 00	65 00
Cornellian, 12 to 14 Kil, per doz.	58 00	60 00
Cornellian 16 females, 14 to 16 Kil.	60 00	70 00
Oscar Alf, 3 doz.	44 00	00
Simon, 18 Kil, 3 doz.	60 00	00
Simon, 20 Kil, 3 doz.	65 00	00
Simon, 24 Kil, 3 doz.	72 00	00
Robert Quil, 7 and 8 Kil.	55 00	40 00
French Kips, 3 B.	1 00	1 20
California Kip, 3 doz.	55 00	70 00
French Kips, all colors, 3 doz.	8 00	15 00
Eastern Calf for Backs, 3 B.	0 00	1 25
Sheep Roofs for Topping, all colors, 3 doz.	9 00	13 00
Sheep Roofs for Linings, 3 doz.	5 50	10 50
Clifford, Sheep Linings, 3 doz.	5 00	5 50
Best Jodot Calf Boot Legs, 3 pair.	4 50	5 00
Good French Calf Boot Legs, 3 pair.	4 50	5 00
Harmon Calf Boot Legs, 3 pair.	3 00	3 75
Fair Bridle Leather, 3 doz.	45 00	72 00
Skirting Leather, 3 B.	34 00	37 50
Welt Leather, 3 doz.	30 00	50 00
Buff Leather, 3 foot.	18 00	23 00
Wax Side Leather, 3 foot.	20 00	22 00
Eastern Wax Leather.	25 00	25 00

San Francisco Metal Market.

PRICES FOR INVOICES.

Todding prices rule from ten to fifteen per cent. higher than the following quotations.

TUESDAY, Jan. 7, 1873.

IRON.—		
Scotch Pig Iron, 3 ton.	\$50 00	@ 55 00
White Pig, 3 ton.	50 00	@ 55 00
Sheffield Pig, assortment, 3 B.	—	@ 55 00
Refined Bar, good assortment, 3 B.	—	@ 06 50
Boiler, No. 1 to 4.	—	@ 05 00
Plate, No. 5 to 9.	—	@ 06 00
Sheet, No. 10 to 12.	—	@ 07 00
Sheet, No. 14 to 20.	—	@ 07 00
Sheet, No. 24 to 27.	—	@ 08 00
Horse Shoes.	—	@ 09 00
Nail Rods.	—	@ 09 00
Norway Iron.	—	@ 09 00
Roller Iron.	—	@ 09 00
Other Irons for Blacksmiths, Miners, etc.	5 1/2	@ 6 1/2
COPPER.—		
Sheathing, 3 B.	—	@ 45 00
Sheathing, Yellow.	—	@ 45 00
Sheathing, Old Yellow.	—	@ 45 00
Composition Nails.	—	@ 25 00
Composition Bolts.	—	@ 25 00
TIN PLATES.—		
Sheet, Charcoal, 18 1/2 box.	18 00	@ —
Plate, 10 Charcoal.	14 00	@ —
Roofing Plates.	18 50	@ —
Banco Tin, Slabs, 3 B.	—	@ 50 00
Sheet, English Cast, 3 B.	—	@ 20 00
Drill.	—	@ 20 00
Flat Bar.	—	@ 20 00
Plough Points.	—	@ 15 00
Russia (for mould boards).	12 1/2	@ 15 00

A Splendid Paper.

Messrs. EDITORS.—Your RURAL PRESS is a splendid paper. I am very much pleased with it.

L. S. PRESTON.

PACIFIC MINERAL LAND OFFICE—HOYT, SEARS & McKEE—MERCHANTS' EXCHANGE, CALIFORNIA STREET, SAN FRANCISCO, CAL.—Mining Patents obtained for claims in California, Nevada, Utah, Arizona, and elsewhere. Plans and papers prepared for adverse claimants, as required by the new law, re-locations effected. All claims have lapsed under the Congressional Act of May 10, 1872; Mining Contests conducted before the Departments and Courts.

Mr. McKee's experience as Chief of the Mining Claims Division, General Land Office, Washington, D. C., will be valuable to parties desiring to properly appear either as claimants for patents or as adverse claimants. Claims are attended to in person at any of the District Land Offices, or at the Departments at Washington, where deemed necessary. JAS. T. HOYT, W. H. SEARS, O. H. MCKEE. 1726-3m

WONDERFUL CURE.—A young man, a resident of this city, gives us the facts of the following remarkable cure. He says: "I suffered with Catarrh in its worst form. Bones came from my nose; my breath became offensive; I was compelled to eat alone. I had given up all hopes of being cured. At this time met Dr. Evory, of Chicago, who had been cured by a remedy discovered by himself. I tried the remedy, with little faith; but at the end of three months found myself cured." Our informant has now associated himself with the discoverer in the manufacture of the article, which will be known under the name of the Diamond Catarrh Remedy. Price 50 cts.; sent by mail for 60 cts. A. F. EVORY & CO., No. 9 Post street, San Francisco. Sold by all druggists. 26725-3m

NO LIFE INSURANCE COMPANY has a better record or more permanently popular reputation than the CONNECTICUT MUTUAL LIFE INSURANCE CO., J. R. Roberts, 315 California street, San Francisco. It is recommended by all the best. Send him for circular and information of this reliable, first-class company.

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The Illustrated Press, SAN FRANCISCO.

A NEW JOURNAL OF FINE ILLUSTRATIONS, Choice Literature, Art and Refined Amusements. Sold by subscription, \$1.50 a year. Samples, 15 cents.

Contents for Jan. 1873.

ILLUSTRATIONS.—The Polar Bear, Pioneer's First View of the Sierras, The Little Col. A. Evans, Will it be "Yes" or "No," Horace B. Cladin, The Attack on Place Vendome, A Christmas Carol, "A Merry Christmas," A the end of the Year, "St. Nicholas on His Travels, An Ice Country Dance, Cape Horn—On the Columbia River, How to make Wax Flowers, Old Dog Tray.

EDITORIALS.—Here We Are—Introductory, California, Letter from President Gilman, The Literary Journal of the Day, Now and Then, "Turned Out to Die," Art Etchings, Studio Notes, Music, The Drama, List of members of S. F. Art Association, Our Young Folks' Corner, Old Fashioned Games, Unlabeled.

POETRY.—Colima, The Lark, A Dream of Home, Christmas on the Street Cars, Alphabet of Short Rules, The Poem on the West, Sir Beulah's children, The Poem.

MISCELLANEOUS.—A Candidate for the Rope, The First American Ship, Conversation in Society, A Legend of the Mohawk Valley, Saved in Mid Air, Miss Pert, I Thought it My Duty, The Science of Leaching, A Beautiful Point in, What is Insanity, What is Dirt, Too Late, Iron and Coal in the U. S., The Origin of Alphabets, The Bell, Getting Married, About Dogs, A Christmas Amusement, Witicism, The Housekeeper, Guess of Thought.

Just issued. Canvassers wanted. Address MURRAY, DEWEY & CO., Publishers, 214 Clay St., S. F. W. H. MURRAY.

Technical Education.

Prof. D. C. Gilman, before the Mechanic Arts College, Mechanics' Institute Hall, S. F.: **Lecture 1. Jan. 4.**—The first lecture of the course to be delivered before the Mechanic Arts College, by the provisions of the State University, was given by Professor D. C. Gilman, President of the University, on Saturday evening last. The subject was "Polytechnic Schools at Home and Abroad." The lecture was opened under the head of "the relation of knowledge to wealth," the speaker stating that the subject to be considered is of vital importance. It involved two questions: "How can we grow wiser?" and "How can we grow richer?" In one of these questions he said we are all interested; in the other we ought to be. In communities wisdom and wealth walk hand in hand. Individuals do not always find this true in their own experience; there may be the exceptions to the rule, but the progress of nations and States is almost always in direct relation to their intelligence and education.

Respecting Education, Great Changes of Opinion Have come about during the last twenty-five years, since the time, we will say, when men who are still fresh and young, the men of forty-five and fifty years of age, completed their schooling. This change requires far more attention than has hitherto been given to theoretical and applied science. The tendency toward the study of mathematical, physical and natural sciences shows itself in all the older colleges, in Cambridge, New Haven, and Princeton and Dartmouth. It has secured from Congress a grant for the establishment of a scientific college in every State of the Union. It has entered the old English universities and modified their traditional courses. It is unexpectedly becoming the entering wedge by which modern ideas are to make their way to Turkey, Syria, India, China and Japan, in every one of which countries modern science, taught by American teachers, is already speaking to those who have hitherto been in darkness. What is this movement, which is so universally recognized as important? It is a recognition of the fact that

A Study of the Laws of Nature, Of the principles by which the universe is shaped and governed; that investigation of the rocks, the stones, the seas, the winds, the climate, the vegetation, the animal life, the human frame, the origin of man, the occult forces of light and heat and magnetism, the laws of motion and force, in all their intricate correlations, is fruitful of good to individuals and to nations.

When this general principle comes to be recognized in the school-room or the college, it is quickly analyzed into subordinate propositions like these: 1st—Everybody should learn something of natural science. 2d—Nobody can learn everything. 3d—In making the selection the practical needs of our circumstances, of our own times and their surroundings, should not be forgotten; in other words, utility or practical advantage should be sought. 4th—We must equally plan for the higher wants of our higher nature; the development of all our intellectual and moral powers, that our infinite as well as finite wants may be supplied; in other words, to practical skill culture must be added.

Coming among you as a stranger, it has given me the greatest pleasure to recognize in California the hearty and healthy acceptance of these principles; and to find that not only in the acts by which the University of California were created, and in the doings of the Regents and the Faculty, but also in the sentiments of the people—educated men and practical men alike—there is a manifest determination to secure for this State a system of education, from the common school to the university, which shall be in harmony with the most enlightened spirit of the age, and which shall thus be worthy of the extraordinary gifts here bestowed by Nature, and of the equally extraordinary opportunities here opened to civilized mankind.

The Whole State of California Needs Scientific Education, Your mines, your agriculture, your manufactures and your transportation cry for schools and colleges in which the young may be trained in those branches of sciences which underlie these modern callings. Elsewhere, and under other auspices, I shall endeavor to uphold the interest of the State in technical education. The point of view to be taken this evening is that of San Francisco. In every community a great city is a miniature State; here are crowded together representatives of callings; here in the school-house where they prepare for life; the market where they sell; the manufactory where they produce; and the refuge to which they flock in poverty and in wealth; here in a compact, accessible mass of busy workers, we may study most of the wants of the State at large.

San Francisco. The lecturer at this point went into a study of San Francisco—its population, its harbor, its commerce, and the occupations of the people, dividing the occupations of the latter into six groups, namely: Agriculture, including market gardeners and nurserymen; Trade, including both wholesale and retail traders, shopkeepers and merchants; Transportation—rail-

road men, horse-car men, expressmen, sailors and carmen; Manufacturers—mining and mechanical; Arts; Personal service—household domestics, unskilled day laborers, barbers, etc.; Professional life—clergymen, lawyers, physicians, journalists and teachers. He then glanced at the statistical information current in regard to those employed in what are designated

The Mechanic Arts. There are, he said, 22,000 persons in this group—how are they employed? Nearly 5,000 (4,917) are men engaged in building and furnishing and repairing the houses in which we dwell, that is to say, are carpenters, masons, painters, plumbers and cabinet-makers. Nearly 4,000 (3,563) are engaged in making the clothes we wear—the tailors, the milliners, the shoemakers and the hatters, pursuits in which the needle and the sewing-machine are controlling forces. Somewhat more than 2,000 (2,012) persons are engaged in preparing food and drink for us to consume—not counting the market men who sell it or the hotel keepers who dispense it, but including bakers, butchers, brewers, fishermen, confectioners and distillers. Almost 2,000 persons, chiefly Chinese, are making up cigars and tobacco for us or for themselves to consume. This accounts for 13,000 of our 22,000. Among the blacksmiths and iron and steel workers we shall find more than 1,500, besides 600 tanners. The miners here resident are more than 1,000. Printers, book-binders and paper mill operatives count nearly 700. Over 400 persons are enrolled as machinists; nearly 400 are operatives in cotton and woolen mills; nearly 400 are ship riggers and carpenters. The remaining 4,500 are distributed in minor groups, too numerous to mention. San Francisco does not differ materially from Boston in respect to the mechanic arts, and although Boston is larger and older, and her wants are more diversified, still the difference in each of the divisions named is slight—the great difference being in mechanical labor and manufacturing interests being exceeded by that city.

Analysis of What is Required Educationally. Now let us sum this up in a few general propositions. It is an acknowledged fact, an axiom of political science, that every nation which would continue in these days to flourish must encourage liberal and systematic instruction in the modern arts and sciences. It is possible in these respects for California to be the equal, if not the superior, of every other American State—because she is free from the overpowering pressure of other traditions and influences, her educational affairs being still in the formative age; because her population is largely made up of intelligent men whose pursuits have made them eager to favor for their boys this sort of training; and because the State within its own territory possesses on an enlarged scale opportunities for fostering the four great branches of modern industry—agriculture, mining, the mechanic arts, and transportation (foreign and domestic). Two distinct wants are to be supplied—the wants of such persons (chiefly mature men) who desire to supplement what knowledge they have already acquired from books, or from life, by more definite, more modern or more advanced instruction in applied science, having reference to technical and industrial callings; the wants of those persons (chiefly young men of the college age) who wish to pursue a long and systematic course of study, with reference to the modern professions (as distinguished from the ancient), and who wish to be thoroughly fitted for the highest duties of scientific men. These two wants are not antagonistic, but are simply different phases of the same social requirement. These two wants are to be met by two distinct efforts. The ordinary

Scientific Classes of the University (Which are its first care), are designed to train up young men to be thorough and well-disciplined experts in the various modern sciences—that they in their turn, may be teachers, advisers and helpers of those who are less favored. This instruction in California must chiefly begin in Oakland or Berkeley. The polytechnic classes, on the other hand, designed for such shorter courses as men already at work desire, may chiefly be taught in San Francisco, during the evenings, in connection with the Mechanics' Institute or otherwise; and in giving this instruction, it will be imperative to supplement the efforts of the scientific faculty of the University with the assistance of other teachers, temporary or permanent. Great advantages (and not those of economy alone) will come from keeping the scientific and polytechnic instructions under one control. The attempt to satisfy these wants in a half-way and incomplete style, will be damaging to industry, science, education and the good name of California. It will be better to wait one year, or five years, until the community can be thoroughly enlightened and aroused as to their own best good, than to go forward at once in a slipshod and haphazard effort. It must be distinctly understood that good

Scientific Instruction Is costly to somebody; like everything else worth having—a good railroad or steamship, a good building or a well-organized city—it takes money. Other callings pay much better than education, and able men of science do not beg for employment. The supply is not equal to the demand. Moreover, the various branches of science require men whose are specialists. An admirable engineer may be a very poor agriculturist; an excellent geologist and mineralogist may be a very poor mining engineer; the accomplished hotanist may be an incompetent adviser in the use of the turbine or steam en-

gine. It is high special attainments which society calls for. These studies are never hostile or prejudicial to literary or classical pursuits; they are simply the additional means of culture which our age possesses. They are not hostile or prejudicial to the everlasting principles of religion, for they are based upon the laws of nature, which are the laws of truth. There is a three-fold application to these principles: The authorities of the University should strive, as they are now doing, to promote both the regular, prolonged and systematic study of science, and also the polytechnic classes which shall give briefer, more practical and more popular instruction, especially in those branches which have a practical bearing upon the pursuits of California.

The Public Must Provide the Means Of giving this instruction on a scale worthy of the names of the Golden State and the Golden Gate. The State must increase its allowance or the city must be encouraged to help this branch of the school system; or far better yet, those who have been prospered in the acquisition of wealth must endow the chairs and provide the apparatus and the materials by which this instruction can be given. The young men of California must prepare themselves for and must enter upon these modern scientific pursuits, if they would guide the future industries of this State and build it up in wealth and prosperity. Their own enjoyment in life, their daily comfort, and their appreciation of all that is good will be thus quickened; and so also the influence of California, throughout the nation and the world, will be honorably and permanently augmented.

Mining and Other Companies.

Outing to the time necessary to mail the present large edition of the M. & S. Press, we are obliged to go to press on Thursday evening—which is the very latest hour we can receive advertisements.

Amazon Silver Mining Company—Location of works, Ely District, Lincoln County, Nevada. Notice is hereby given, that at a meeting of the Board of Trustees of said Company, held on the Twenty-second day of October, 1872, an assessment of ten cents per share was levied upon the capital stock of said Company, payable immediately in United States gold and silver coin, to the Secretary of the Company, at his office, No. 609 Sacramento street, San Francisco, Cal. Any stock upon which said assessment shall remain unpaid on the sixth day of January, 1873, shall be deemed delinquent, and will be duly advertised for sale at public auction, and unless payment shall be made before, will be sold on Wednesday, the 22d day of January, 1873, to pay the delinquent assessment, together with costs of advertising and expenses of sale. By order of the Board of Trustees.

M. J. McMANUS, Secretary pro tem.
Office, 609 Sacramento street, San Francisco, Cal.

Amazon Silver Mining Company—POSTPONEMENT. The day for assessing stock delinquent on the above Assessment is hereby postponed until Thursday, the 22d of January, 1873, and those thereof until Friday, the fourteenth day of February, 1873. By order of the Board of Trustees. J. H. McMANUS, Secretary pro tem.

Cordillera Gold and Silver Mining Company—Location of property, Morelos Mining District, Chihuahua, Mexico. At a meeting of the Board of Trustees held at the office of the Company, December 21st, 1872, a special assessment of fifteen cents (15 cts.), was levied on each and every share of the capital stock of the Company, payable immediately in coin, to the Secretary of the Company, No. 321 Washington street, San Francisco, Cal. Any stock upon which said assessment shall remain unpaid on Tuesday, the 21st day of January, 1873, shall be deemed delinquent, and will be duly advertised for sale at public auction, and unless payment shall be made before, will be sold on Monday, the 14th day of February, 1873, to pay the delinquent assessment, together with the costs of advertising and expenses of sale.

W. F. REED, Secretary.
Office, 321 Washington street, San Francisco, Cal. December 25th, 1872.

Gold Run Mining Company—Location of works, Nevada County, Cal. Notice is hereby given, that at a meeting of the Board of Trustees of said Company, held on the 30th day of December, 1872, an assessment of ten (10) cents per share was levied upon the capital stock of said Company, payable immediately in United States gold coin, to the Secretary, at his office, corner of Market and Spear streets, San Francisco. Any stock upon which said assessment shall remain unpaid on Tuesday, February 4th, 1873, shall be deemed delinquent, and will be duly advertised for sale at public auction, and unless payment shall be made before, will be sold on Tuesday, February 25th, 1873, to pay the delinquent assessment, together with costs of advertising and expenses of sale.

C. C. PALMER, Secretary.
Office, corner Market and Spear streets, S. F. Jan 1st

A Special Meeting of the Stockholders of the Gold Run Mining Co., for the election of a new Board of Trustees, and for the transaction of such other business as may properly come before the meeting, will be held at the office of the Secretary, corner of Market and Spear streets, on Tuesday, February 4th, at 12 o'clock M. By order of Board of Trustees.

C. C. PALMER, Secretary.

Great Blue Gravel Range Company—Location of works, Blue Gravel Range, Placer County, California. Notice.—There are delinquent upon the following described stock, on account of assessment levied on the 16th day of November, 1872, the several amounts set opposite the names of the respective shareholders as follows:

Names.	No. Certificate.	No. Shares.	Amount.
Babcock, T. J.	145	25	\$2 50
Babcock, T. J.	147	25	2 50
Babcock, T. J.	148	25	2 50
Babcock, T. J.	153	100	10 00
Babcock, T. J.	156	100	10 00
Babcock, T. J.	158	50	5 00
Babcock, T. J.	159	50	5 00
Babcock, T. J.	199	50	5 00
Babcock, T. J.	200	50	5 00
Babcock, T. J.	201	50	5 00
Babcock, T. J.	202	50	5 00
Babcock, T. J.	203	50	5 00
Babcock, T. J.	204	50	5 00
Babcock, T. J.	205	50	5 00
Babcock, T. J.	206	50	5 00
Babcock, T. J.	207	50	5 00
Babcock, T. J., Trustee	94	100	10 00
Babcock, T. J., Trustee	111	5	50
Babcock, T. J., Trustee	112	5	50
Babcock, T. J., Trustee	113	25	2 50
Babcock, T. J., Trustee	119	25	2 50
Babcock, T. J., Trustee	116	200	20 00
Babcock, T. J., Trustee	117	100	10 00
Babcock, T. J., Trustee	118	100	10 00
Baillie, Margaret	1	5	50
Berry, Mrs. Julia A.	1	40	4 00
Brown, C. E., Mrs.	215	25	2 50
Brown, C. E., Mrs.	216	25	2 50
Cummings, Wm. H.	59	100	10 00
Dewey, O. H.	39	100	10 00
Hunt, C. A.	161	55	5 50

Names.	No. Certificate.	No. Shares.	Amount.
Hunt, E. T., Trustee	10	50	5 00
Horn, Eliza, Mrs.	167	20	2 00
Horn, Eliza, Mrs.	170	20	2 00
Horn, Eliza, Mrs.	196	25	2 50
Murphy, M. A.	163	20	2 00
Murphy, M. A.	223	100	10 00
Murray, E. B.	102	5	50
Marshall, Ann.	103	5	50
Murphy, M. A., Mrs.	163	5	50
Peck, E. S. (unissued)		2252	225 20
Peck, E. S.	43	20	2 00
Thompson, M. D.	268	125	12 50
Peck, T. E.	47	200	20 00
Reed, S. B.	46	50	5 00
Russell, Geo. T.	48	200	20 00
Janell, Geo. T. (unissued)		845	84 50
Russell, Geo. T.	217	153	15 30
Rose, Mary E.	162	20	2 00
Snell, Geo. P.	184	50	5 00
Thompson, J. M.	55	50	5 00
Thompson, J. M.	66	50	5 00
Thompson, J. M.	67	50	5 00
Thompson, J. M.	68	50	5 00
Thompson, J. M. (unissued)		4583	458 30

And in accordance with law, and an order of the Board of Trustees, made on the 16th day of November, 1872, so many shares of each parcel of said stock as may be necessary, will be sold at public auction, at the office of the Company, Room 5 and 6, No. 302 Montgomery street, San Francisco, Cal., on Tuesday, the 28th day of January, 1873, at the hour of 1 o'clock p. m. of said day, to pay said delinquent assessment thereon, together with costs of advertising and expenses of sale.

WM. H. WATSON, Secretary.
Office, Room 5 and 6, No. 302 Montgomery street, San Francisco, Cal. Jan 1st

Hudson Gold Mining Company—Location of works, Cherokee Mining District, Plumas County, State of California. Notice.—There are delinquent upon the following described stock, on account of assessment (No. 2) levied on the 11th day of November, 1872, the several amounts set opposite the names of the respective shareholders as follows:

Names.	No. Certificate.	No. Shares.	Amount.
Curtis, J. P.	43	500	\$37 50
Fassett, N. H.	9	100	7 50
Hansen, George.	36	100	7 50
Konny, O. A., Trustee	27	275	20 62
McClellan, H. H.	28	500	37 50
McClellan, H. H.	32	100	7 50
Mack, Julius.	39	100	7 50
Olmedo, S. E.	40	375	28 13
Olmedo, S. E.	41	1200	90 00
Olmedo, S. E.	42	800	60 00
Olmedo, S. E.	44	100	7 50
Rowe, Robt.	55	250	18 75
Smith, F. A.	16	2000	150 00
Smith, F. A.	16	475	35 62
Ubler, J. Clem, Trustee	26	200	15 00
Warner, Charles H.	34	250	18 75

And in accordance with law, and an order of the Board of Trustees, made on the eleventh day of November, A. D. 1872, so many shares of each parcel of said stock as may be necessary, will be sold at public auction, at the office of the Company, No. 411 California street, San Francisco, California, on Monday, the 6th day of January, A. D. 1873, at the hour of 1 o'clock p. m. of said day, to pay said delinquent assessments thereon, together with costs of advertising and expenses of sale.

JOS. L. KING, Secretary.
Office, 411 California street, San Francisco, California. Jan 1st

Hardy Coal Mining Company—Location of works, Coosue County, Oregon. Notice.—There are delinquent upon the following described stock, on account of assessment levied on the 15th day of November, 1872, the several amounts set opposite the names of the respective shareholders, as follows:

Names.	No. Certificate.	No. Shares.	Amount.
Thomas Hardy	7 (New)	75	\$37 50
Thomas Hardy	8 (New)	19	9 50
Thomas Hardy	18 (New)	155	77 50
Thomas Hardy	34 (New)	29	14 50
Thomas Hardy	34 (Old)	31	15 50

And in accordance with law, and an order of the Board of Trustees, made on the 15th day of November, 1872, so many shares of each parcel of said stock as may be necessary, will be sold at public auction, at the office of the Company, Room 5, No. 338 Montgomery street, San Francisco, California, on Saturday, the 18th day of January, 1873, at 11 o'clock A. M. of said day, to pay said delinquent assessment thereon, together with costs of advertising and expenses of sale.

JACOB HARDY, Secretary.
Office, Room 5, No. 338 Montgomery street, San Francisco, California. Jan 1st

The above sale is postponed till Wednesday, January 15th, 1873, at the same hour and place. By order of Board of Trustees.

JOSEPH L. KINO, Secretary.
San Francisco, Jan. 6th, 1873.

Ivanhoe Silver Mining Company—Location of works: Ely District, Lincoln County, State of Nevada. Notice is hereby given, that at a meeting of the Board of Trustees of said Company, held on the 12th day of December, 1872, an assessment of three dollars per share was levied upon the capital stock of said Company, payable immediately in United States gold coin, to the Secretary, at his office, 220 Clay street, San Francisco. Any stock upon which said assessment shall remain unpaid on Tuesday, the 8th day of January, 1873, shall be deemed delinquent, and will be duly advertised for sale at public auction, and unless payment shall be made before, will be sold on Thursday, the 8th day of February, 1873, to pay the delinquent assessment, together with costs of advertising and expenses of sale. By order of the Board of Trustees.

DANIEL BUCK, Secretary.
Office, 14 Stevenson Building, No. 351 Montgomery street, San Francisco. Jan 1st

Kincaid Flat Mining Company—Location of works: Tuolumne County, State of California. Notice is hereby given, that at a meeting of the Board of Trustees of said Company, held on the 8th day of December, 1872, an assessment of three dollars per share was levied upon the capital stock of said Company, payable immediately in United States gold coin, to the Secretary, at his office, 220 Clay street, San Francisco. Any stock upon which said assessment shall remain unpaid on Tuesday, the 8th day of January, 1873, shall be deemed delinquent, and will be duly advertised for sale at public auction, and unless payment shall be made before, will be sold on Thursday, the 8th day of February, 1873, to pay the delinquent assessment, together with costs of advertising and expenses of sale. By order of the Board of Trustees.

R. H. CORRELL, Secretary.
Office, 220 Clay street, San Francisco. Jan 1st

Mount Jefferson Milling and Mining Company, Location of works: First Oarote, Tuolumne County, California. Notice is hereby given, that at a meeting of the Board of Trustees of said Company, held on the eleventh day of December, A. D. 1872, an assessment of fifteen cents per share was levied upon the capital stock of said Company, payable immediately in United States gold coin, to the Secretary, at his office, 415 California street, San Francisco, Cal. Any stock upon which said assessment shall remain unpaid on Monday, the 27th day of January, A. D. 1873, shall be deemed delinquent, and will be duly advertised for sale at public auction, and unless payment shall be made before, will be sold on Monday, the 11th day of February, 1873, at the hour of 2 o'clock P. M. to pay the delinquent assessment, together with costs of advertising and expenses of sale. By order of the Board of Trustees.

J. W. CLARK, Secretary.
Jan 1st

Other Mining Advertisements on page 32.

Machinists and Foundries.

ESTABLISHED 1851.

PACIFIC IRON WORKS,

First and Fremont streets,

SAN FRANCISCO

J. P. RANKIN, A. P. BRAYTON,
GEO. W. FOGG, Superintendent.**Steam Engines and Boilers,**

MARINE AND STATIONARY,

IRON AND BRASS CASTINGS

Mining Machinery of Every Description,

And all other classes of work generally done at first-class establishments, manufactured by us at the lowest price, and of the best quality.

Particular attention paid to Jobbing Work and Repairs.

N. B.—Sole Agents for sale of HUNTOON'S OLEBRATED PATENT GOVERNOR.
18720-3m GODDARD & CO.**FULTON****Foundry and Iron Works.**

HINCKLEY & CO.,

MANUFACTURERS OF

TEAM ENGINES,**Quartz, Flour and Saw Mills,**

Wheeler's Improved Steam Pump, Brodie's Improved Crusher, Mining Pumps, Amalgamators, and all kinds of Machinery.

N. E. corner of Tehama and Fremont streets, above How street, San Francisco. 3-47

GEORGE T. PRACY, MACHINE WORKS,109 and 111 Mission Street,
SAN FRANCISCO.

These Works have lately been increased, by additional Tools, and we are now able to turn out any kind of work, equal to and cheaper than any establishment in the State; that is to say:—

STEAM ENGINES,
Flour and Saw Mills,
QUARTZ MACHINERY
Printing Presses,

AND MACHINERY MADE OF EVERY DESCRIPTION.

Improved Safety Store Hoists,

Fitted with Cutting's Patent Came, unequalled for safety, convenience and cheapness. This Hoist can be built for about half the price of any other in use. To be seen at HAWLEY & CO.'S.

ALSO, MANUFACTURER AND SOLE AGENT FOR
Pracy's Celebrated Governor.TURNING LATHES, Etc., constantly on hand.
4v23lf**UNION IRON WORKS,**
Sacramento.**ROOT, NEILSON & CO.,**

MANUFACTURERS OF

STEAM ENGINES, BOILERS,

CROSS' PATENT BOILER FEEDER AND SEDIMENT COLLECTOR

Dunbar's Patent Self-Adjusting Steam Piston

PACKING, for new and old Cylinders.

And all kinds of Mining Machinery.

Front Street, between N and O streets,
SACRAMENTO CITY.**PACIFIC****Rolling Mill Company,**
SAN FRANCISCO, CAL.

Established for the Manufacture of

RAILROAD AND OTHER IRON**Every Variety of Shafting,**

Embracing ALL SIZES of

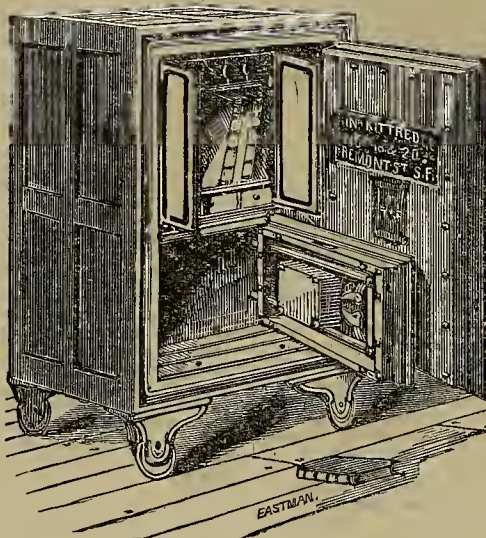
Steamboat Shafts, Cranks, Piston and Connecting Rods, Car and Locomotive Axles and Frames

—ALSO—
HAMMERED IRON

Of every description and size.

Orders addressed to PACIFIC ROLLING MILL COMPANY Post Office, San Francisco, Cal., will receive prompt attention.

The highest price paid for Scrap Iron. 9v143

PHENIX IRON WORKS.

MANUFACTORY OF

Iron Doors and Shutters,

Wrought Iron Girders,

Prison Cells,

Bank Vaults, and

Bank Locks.

A LARGE ASSORTMENT OF SAFES OF ALL KINDS CONSTANTLY ON HAND.

ALL KINDS OF HOUSE SMITH WORK, FIRE-PROOF SAFES, MONITOR SAFES, FIRE AND BURGLAR-PROOF SAFES.

JONATHAN KITTREDGE,

Nos. 18 and 20 Fremont Street, Near Market, SAN FRANCISCO.

Send for Descriptive Circulars and Price List.

7v4-1am5mhp

H. J. BOOTH & CO.,
UNION IRON WORKS,

(The Oldest and most Extensive Foundry on the Pacific Coast).

Cor. First and Mission Sts.,
SAN FRANCISCO.Marine, Locomotive and Stationary Engines
Quartz Crushing and Amalgamating Machines, Mill Irons and Brass and Iron Castings, of every description, made to order.Steamboat Repairing, Boiler Making, Turning and Finishing,
EXECUTED WITH DISPATCH.

Best Sugar Machinery complete in every part—made specially.

OIL MACHINERY.

A complete set of Machinery of our own design and patent for extracting oil from Castor Bean, dispensing with Hair Cloth. Also Machinery for Flax Seed Oil, Mustard Seed Oil, and Sun Flower Seed Oil.

MARBLE MACHINERY

For sawing Marble of any thickness or size.

Irrigating Pumps. Steam Pumps.

Plane, Estimatee, and Advice promptly supplied.

H. J. BOOTH, GEO. W. PRESCOTT, IRVING M. SCOTT
4v24-1yslamr**A. HANKE'S**
IRON FOUNDRY,

CORNER MAIN AND HARRISON STREETS,

Entrance on Main Street.....San Francisco.

Every Description of Ornamental Work,
Stove and French Range Work, grate and fender work, small machines of all descriptions, house work, etc., promptly attended to.
25v25-3m**THOMPSON BROTHERS,**
EUREKA FOUNDRY,129 and 131 Beale street, between Mission and Howard,
San Francisco.**LIGHT AND HEAVY CASTINGS,**
of every description, manufactured. 24v16qr**THEODORE KALLENBERG,****MACHINIST,**and Maker of Models for Inventors. All kinds of Dies
Stamps and Punches made. Also, all kinds of
Small Gear Cut.

Repairing done on very Reasonable Terms and in the best manner. No. 32 Fremont street, S. F. 19v23-3m

GEO. W. PRESCOTT, G. W. SCHEIDEL, W. N. BOKART
PRESCOTT, SCHEIDELL & CO.,
MARYSVILLE FOUNDRY.

Corner of B and Fourth streets, Marysville, Cal.

MANUFACTURERS OF

STEAM ENGINES,

STATIONARY AND PORTABLE

SAW AND GRIST MILLS,

Hydraulic Machinery,

Quartz Crushing and Amalgamating Machinery

Of every description, constantly on hand.

Plane and estimatee furnished upon application. Repairs upon all kinds of Machinery promptly made, and at moderate charges.

Having unrivalled facilities, we are prepared to make to order, at short notice, anything required in our line. Specimens of our work may be seen in all the mining regions on this coast.

THE RISDON
Iron and Locomotive Works.

INCORPORATED.....APRIL 30, 1868.

CAPITAL.....\$1,000,000.

LOCATION OF WORKS:
Corner of Beale and Howard Streets,
SAN FRANCISCO.

Manufacturers of Steam Engines, Quartz and Flour Mill Machinery, Steam Boilers (Marine, Locomotive and Stationary), Marine Engines (High and Low Pressure). All kinds of light and heavy Castings at lowest prices. Cams and Tappets, with chilled faces, guaranteed 40 per cent. more durable than ordinary iron.

Directors:
Joseph Moore, O. J. Brenham, O. E. McLane,
Wm. Norris, Wm. H. Taylor, Lloyd Tevis,
James D. Walker.WM. H. TAYLOR.....President
JOSEPH MOORE.....Vice-President and Superintendent
LEWIS R. MEAD.....Secretary
24v17-qr**Miners' Foundry and Machine Works,**

CO-OPERATIVE,

First Street, bet. Howard and Folsom, SAN FRANCISCO

Machinery and Castings of all kinds.

OCCIDENTAL FOUNDRY,

137 and 139 First et., near the Gas Works, San Francisco.

STEIGER & BOLAND,**IRON FOUNDERS.**

IRON CASTINGS of all descriptions at short notice

All orders punctually executed in time agreed on. Particular attention paid to making superior Shoes and Dies. Among the special castings of this Foundry are the well known CALLAHAN GRATE BAR, of superior merit for burning screenings—all size Bars. STRATTON'S JACK SOREWS, all sizes. Superior, compact and effective Horse Powers, Pumps, Agricultural Castings, Ingot Moulds, Assaying and Refining Retorts and Kettles, and a great variety of other and special castings.

STEIGER & BOLAND Proprietors.

Steiger & Boland are the sole Manufacturers of the Improved Hepburn Roller Pan. The patterns having all the improvements to these Pans, are at the Occidental Foundry, enabling the Establishment to deliver all pans and parts thereof with uniformity, finished in the best style, and at the lowest possible price. Pan Castings furnished the trade, with liberal facilities for erection, &c. All persons are cautioned against making, selling or using these Pans, except through the authorized agents and manufacturers, viz., Steiger & Boland, of the Occidental Foundry, S. F.

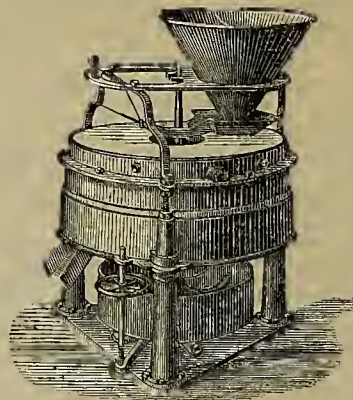
22v25-3m

WM. H. HEPBURN.**CALIFORNIA BRASS FOUNDRY,**

No. 125 First street, opposite Minna,

SAN FRANCISCO.

ALL KINDS OF Brass, Composition, Zinc, and Babbitt Metal Castings, Brass Ship Work of all kinds, Spikes, Sheathing Nails, Rudder Braces, Hinges, Ship and Steamboat Belts and Gongs of superlative. All kinds of Cocks and Valves, Hydraulic Pipes and Nozzles, and Hose Couplings and Connections of all sizes and patterns, furnished with dispatch. PRICES MODERATE. J. H. WEED, Y. KINGWELL

Machinery.**FOR SALE.—A FOUNDRY AND MACHINE**
Shop, in a business country town; terms, half cash—balance on time. Apply at 129 and 131 Beale street. To be sold on account of death of one of the partners. 3t**MILL STONES.**Portable Mills, Eureka Smmt Machines
Bran Dusters, Dufour & Co.'s Celebrated Dutch Anchor
Bolting Cloths, and General Mill Furnishing.**TRAVIS & WAGNER,**
18v24-3m 41 First street, San Francisco.**POWER, TANTER & CO.,**

MANUFACTURERS OF

**WOOD-WORKING MACHINERY.**

3003 Chestnut street, (West end Chestnut street Bridge)

PHILADELPHIA.

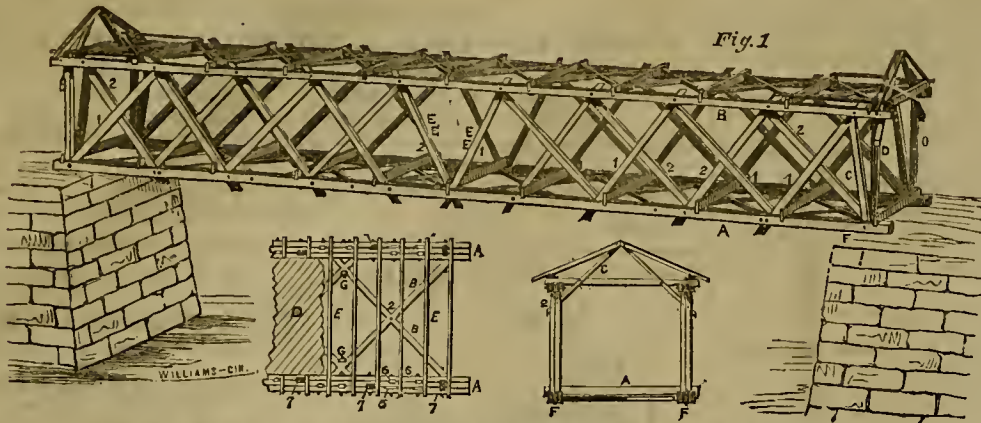
Woodworth Planers a Specialty. 4v25-3m

Notice is hereby given, that the copartnership heretofore existing between A. J. Severance, Charles W. Randall and J. Gus. Burt, under the firm name of "Severance, Holt & Co.," is this day dissolved by mutual consent. A. J. Severance, having purchased all the interest of his late partners, will continue the business of manufacturing and selling Diamond Drills as before, under the style of A. J. Severance & Co. Dated San Francisco, Nov. 24, 1871. Office, 315 California street. A. J. SEVERANCE, CHAS. W. RANDALL, J. GUS. BURT.**FARCIOT & VANDRAKE,**
GENERAL MACHINISTS.
No. 13 Fremont Street (Nelson & Doble's Building),
San Francisco, Cal.**NOTICE.—Special attention called to our new STEAM PUNCHING PRESS, which we have on hand for use of customers. Capacity, 1800 per hour. All kinds of Dies and Punches made to order. 23v25-3m****FOR SALE.****LENOIR GAS ENGINE,**

French Half Horse Power,

Equal to English Full One Horse Power, with Battery and everything complete. Price \$800. Inquire at GUIDE OFFICE, 521 Clay street, third floor. d21-4t

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WORKS NEAR SOUTH POINT MILL, BERRY STREET, SAN FRANCISCO, CAL.

Are Prepared, with Superior Machinery, to Manufacture and Build all kinds of Bridges on Smith's, Howe's, and other Improved Plans. Framing of all kinds done by Machinery.

The Smith Bridges have been thoroughly tested in the East for Three Years, and wherever tried have proved superior to any other Bridge in the following points:

Being built of wood entirely, they are not affected by change of temperature.
The timber used is placed so directly in the line of strain, that less material is required to support the same load.
It is not perceptibly affected by shrinkage. It is the most Economical Bridge built. It is adapted to any practicable LENGTH OF SPAN.
Plans, Specifications and Terms will be sent to any County, Township or Person wishing to build a Bridge, and no charge made unless the Plan is used. For all Public Bridges the Plan will always be open to competition.
Smith's celebrated CAST IRON PIER, economical, and adapted to heavy currents, built at low rates.

C. H. GORRILL, Secretary.

W. H. GORRILL, President.

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ALL KINDS
Hydraulic
ELEVATORS,
REVERSIBLE
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STEAM AND HYDRAULIC ENGINES
Power Pumps and Pressure Rams,
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18v25-tf

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—OF—

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(Successor to D. McDonald.)

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ALL SORTS OF STEAM BOILERS
Made to order and repaired.

Also all kinds of Sheet Iron Work done promptly,
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AGENTS FOR

Thomas Firth & Sons' Cast Steel.



MANUFACTURERS OF
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Cutters', Blacksmiths'
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Tools.

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SHEET IRON PIPE.

THE

Risdon Iron and Locomotive Works

Corner Howard and Beale Streets,

Are prepared to make SHEET IRON AND ASPHALTUM
PIPE, of any size and for any pressure, and contract to
lay the same where wanted, guaranteeing a perfect
working pipe with the least amount of material.

Standard sizes of railroad Car Wheels, with special
patterns for Mining Cars. These small wheels are made
of the best Car Wheel Iron, properly chilled, and can be
fitted up with the improved axle and box—introduced by
this company, and guaranteed to outlast any other
wheels made in this State.

All kinds of Machinery made and repaired.
24v23-3m JOSEPH MOORE, Superintendent.

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Machine Bolts, Bridge Bolts, and Ship or
Band Bolts.

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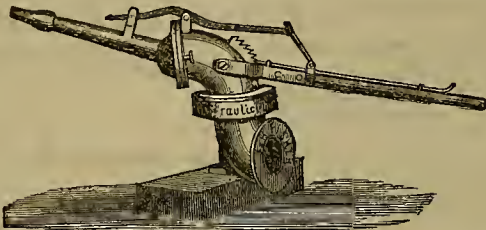
PATTERNS AND MODELS,
(Over W. T. Garratt's Brass Foundry).

N. W. corner Natoma and Fremont streets, S. F. En-
trance on Natoma street. 6v23-3m

HYDRAULIC CHIEF.

FISHER'S
KNUCKLE
JOINT
AND
NOZZLE

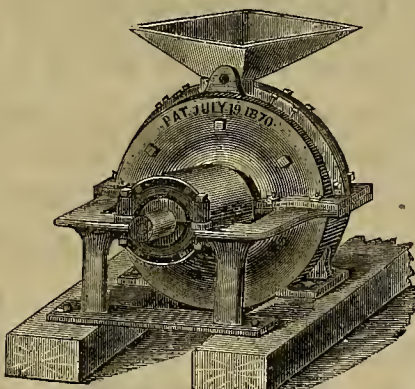
IS THE
Cheapest and Best
Hydraulic Machine
in use.



The only reliable party in this Hydraulic business who protects his patrons.
9v23-tf Address F. H. FISHER, Nevada, Cal.

HYDRAULIC MINERS, TAKE NOTICE—I hereby caution Miners and Manufacturers against making, buy-
ing, selling or using a Hydraulic Machine or Joint known as the Little Giant, manufactured and sold by R. R. &
J. Craig and Richard Hoskin, as the same is an infringement upon the invention of the machine known as FISHER'S
HYDRAULIC CHIEF, secured by Letters Patent, No. 110,222, dated Dec. 20, 1870. All parties participating
in such infringements will be rigorously prosecuted. Nevada, Jan. 13th. F. H. FISHER.

THE LIGHTNING MILL.

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LIGHTNING MILL

For Pulverizing Quartz,

"Charleston Rock," and all Natives Phosphates,
Flint, Feldspar, Iron Ore, Manganese, Antimony,
Carbon, Corundum, Old Crucibles, Barytes, Brim-
stone, Slate, Soapstone, Graphite, Glass, Marble,
Plaster, Anthracite and Bituminous Coals, etc.

WM. STEWART'S

Patent Bone Mills and
Crushers.

For Grinding Bones, Rock, Quartz, and all hard
substances; also, Corn, Wheat, Oats, Barley, Coffee,
Spices, etc.

WALKER BROS. & CO., Twenty-third and Wood Streets, Philadelphia, Sole Manufacturers of Stewart's
Celebrated Patent Bone Mills and Crushers, A. W. Straub & Co.'s Patent Revolution French Burr Mill and A.
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Improved Stop Governor,

Manufactured at the CYCLOPS MACHINE WORKS, 113
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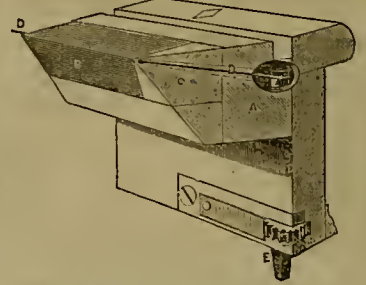
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BOILER MAKERS

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Sketch of Delaney's New Patent Cushion.



DESCRIPTION OF ENGRAVING.

E, pin or regulator, extending into rail; D, steel wire,
tending from pin into and through rubber cushion; B, rub-
ber cushion; C, is end of rubber cushion; A, lining.
Their construction is of the simplest kind, thus making
no heavy expense for apparatus or labor. The im-
provement is a steel wire running lengthwise, and commu-
nicating with a pin at each end and inside of the rail;
the wire is imbedded in the rubber cushion, near its edge or
surface. The pin mentioned is controlled and operated
upon by a key, regulating the tension of the wire, accord-
ing to the necessities of the case. It keeps the edge of the
cushion straight and sharp. It prevents the rubber hard-
ening from the impingement of the ball; and, above all
other considerations, the angles are bound to be perfectly
correct.

The ball never jumps from the table, however severe the
stroke. It makes no noise when leaving the cushion.
Nine cushions are made upon our tables with the same
degree of force requisite to make six up a any other.

These unrivalled cushions are self-protective, and will re-
tain their elasticity either in hot, cold, dry, or damp weather,
almost forever.

Thousands of Delaney's cushions have been introduced
throughout California and the Great West, where the
largest billiard manufacturers now make exclusive use of
them, to the eminent satisfaction of their patrons.

Sole Agents for the Pacific States, China, Japan, Sand-
wich Islands, and Australia.

JACOB STRAHLER & CO.,

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Manufacturers and have constantly on hand

SPORTING,
MINING,
And BLASTING
POWDER,

OF SUPERIOR QUALITY, FRESH FROM THE
MILLS. It being constantly received and transported
into the interior, is delivered to the consumer within a
few days of the time of its manufacture, and is in every
way superior to any other Powder in Market.
We have been awarded successively

Three Gold Medals

By the MECHANICS' INSTITUTE and the STATE AG-
RICULTURAL SOCIETY for this superiority of our
products over all others.

We also call attention to our

HERCULES POWDER.

Which combines all the force of other strong explosive
now in use, and the lifting force of the best blasting
powder, thus making it vastly superior to any other
compound now in use.
A circular containing a full description of this Pow-
der can be obtained on application to our Office.

16v20-3m JOHN F. LOHSE, Secretary.

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G. & H. BARNETT,

Manufacturers of Files of every Description

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California File Manuf'g Co.

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Old Files re-cut and warranted equal to new.

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MANUFACTURER OF TOOLS

—FOR—

Molding, Turning, Carving, Etc
Mortise Chisels, Blind Chisels, Crotch-
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on hand and made
to order.

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CHEMICAL PAINT,

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It is Cheaper, Handsomer, more Durable and Elastic
than the best of any other Paint.
Office, corner Fourth and Townsend streets, San
Francisco. Send for sample card and price list.
15v23-3m ELY & JEWELL, Agents.

Mining Companies.

Mammoth Blue Gravel Company—Location of works, Nevada County, California.

Norror.—There are delinquent upon the following described stock, on account of assessment (No. 1) levied on the 18th day of November, 1872, the several amounts set opposite the names of the respective shareholders as follows:

Names.	No. Certificate.	No. Shares.	Amount.
G W Frasier (Bal).....	9	872	\$39 75
H S Warren.....	12	1742	169 36
S B Whipple (Bal).....	7	1730	138 45
Jae T Dean.....	8	2130	170 40
Mrs S W Croninger.....	13	159	12 72
John Williams (Bal).....	3	238	19 05
Peter Cook.....	14	387	30 96

And in accordance with law, and an order of the Board of Trustees, made on the 18th day of November, 1872, so many shares of each parcel of said stock as may be necessary, will be sold at public auction, at the office of the Company, Room 37, New Merchants' Exchange, on the 13th day of January, 1873, at the hour of 12 o'clock m. of said day, to pay said delinquent assessment thereon, together with costs of advertising and expenses of sale.

J. M. BUFFINGTON, Secretary.
Office, Room 37, New Merchants' Exchange, California street, San Francisco, California. de28-30

Norman Gold Mining Company—Location of works, Aqueduct Mining District, Amador County, California.

Norror.—There are delinquent upon the following described stock, on account of assessment levied on the 11th day of November, 1872, the several amounts set opposite the names of the respective shareholders as follows:

Names.	No. Certificate.	No. Shares.	Amount.
Allen, W. Trustee.....	30	100	\$5 00
Boynston, J.....	162	100	5 00
Boynston, U.....	163	100	5 00
Childs, Geo E.....	29	100	5 00
Dore, B. Trustee.....	119	50	2 50
Dore, B. Trustee.....	120	50	2 50
Dore, B. Trustee.....	139	100	5 00
Dore, B. Trustee.....	141	100	5 00
Dore, B. Trustee.....	145	100	5 00
Duane, W R. Mre.....	117	100	5 00
Eldridge, G C. Trustee.....	163	300	15 00
Eldridge, G C. Trustee.....	17	100	5 00
Eldridge, G C. Trustee.....	18	100	5 00
Humphreys, W T.....	26	100	5 00
Humphreys, W T.....	27	100	5 00
Hymann, S.....	55	100	5 00
Hymann, S.....	57	50	2 50
Mieh, I.....	159	300	15 00
Moon, E J. Trustee.....	68	100	5 00
Plummer, M D. Trustee.....	2	600	25 00
Plummer, M D. Trustee.....	34	300	15 00
Plummer, M D. Trustee.....	33	80	4 00
Ridley, A D. Trustee.....	113	100	5 00
Sheppard, J. L.....	54	100	5 00
Thompson, J M. Trustee.....	9	100	5 00
Thompson, J M. Trustee.....	10	100	5 00
Thompson, J M. Trustee.....	11	100	5 00
Thompson, J M. Trustee.....	12	100	5 00
Thompson, J M. Trustee.....	61	100	5 00
Thompson, J M. Trustee.....	62	100	5 00
Trask, J A.....	20	50	2 50
Trask, J A.....	114	20	1 00
Trask, J A.....	115	20	1 00
Trask, J A.....	116	10	50
Truworthy, T M.....	112	20	10 00
Wayman, W G. Trustee.....	48	100	5 00
Watson, Wm H. Trustee.....	60	1167	58 35
Watson, Wm H. Trustee.....	75	100	5 00
Watson, Wm H. Trustee.....	76	100	5 00
Watson, Wm H. Trustee.....	85	50	2 50
Watson, Wm H. Trustee.....	93	20	1 00
Watson, Wm H. Trustee.....	94	20	1 00
Watson, Wm H. Trustee.....	95	20	1 00
Watson, Wm H. Trustee.....	98	20	1 00
Watson, Wm H. Trustee.....	121	50	2 50
Watson, Wm H. Trustee.....	122	50	2 50
Watson, Wm H. Trustee.....	123	100	5 00
Watson, Wm H. Trustee.....	124	100	5 00
Watson, Wm H. Trustee.....	125	100	5 00
Watson, Wm H. Trustee.....	126	100	5 00
Watson, Wm H. Trustee.....	127	100	5 00
Watson, Wm H. Trustee.....	128	100	5 00
Watson, Wm H. Trustee.....	129	100	5 00
Williams, W J.....	157	100	5 00
Williams, W J.....	158	100	5 00

And in accordance with law, and an order of the Board of Trustees, made on the 11th day of November, 1872, so many shares of each parcel of said stock as may be necessary, will be sold at public auction, at the office of the Company, Room 5 and 5, No. 302 Montgomery street, San Francisco, California, on Thursday, the 23d day of January, 1873, at the hour of 2 o'clock p. m. of said day, to pay said delinquent assessment thereon, together with costs of advertising and expenses of sale.

WM. H. WATSON, Secretary.
Office, Room 5 and 5, No. 302 Montgomery street, San Francisco, Cal. Jan-31

Ophir Copper, Silver and Gold Mining Company of Placer County, California. Location of works: Ophir, Placer County, California.

Notice is hereby given that at a meeting of the Board of Trustees of said Company, held on the 19th day of Dec. 1872, an assessment of ten (10) cents per share was levied upon the capital stock of said Company, payable immediately in United States gold coin, to the Secretary, at the office of the Company, Room 2, Express Building, at 402 Montgomery street, San Francisco, Cal.

Any stock upon which said assessment shall remain unpaid on the 24th day of January, 1873, shall be deemed delinquent, and will be duly advertised for sale at public auction, and unless payment shall be made before, will be sold on Monday, the 30th day of February, 1873, to pay the delinquent assessment, together with costs of advertising and expenses of sale. By order of the Board of Trustees.

O. H. BOGART, Secretary.
Office—No. 402 Montgomery street, San Francisco, Cal. de28

The Piedmont Land Company—Location of property, Alameda County, State of California.

Notice is hereby given, that at a meeting of the Directors of said Company, held on the 27th day of December, 1872, an assessment of seven dollars, gold coin, per share was levied upon the capital stock of said Company, payable immediately to the Secretary of said Company, at his office, No. 522 California street, San Francisco, Cal. Any stock upon which said assessment shall remain unpaid on the 27th day of January, 1873, shall be deemed delinquent, and will be duly advertised for sale at public auction, and unless payment shall be made before, will be sold on the twelfth day of February, 1873, to pay the delinquent assessment, together with costs of advertising and expenses of sale.

FRANK J. VAN DYKE, Secretary.
No. 522 California Street, San Francisco, Cal., Dec. 29, 1872. Jan-31

Rail Road Consolidated Mining Company—Location of works, Railroad District, Elko County, State of Nevada.

Notice is hereby given, that at a meeting of the Board of Trustees of said Company, held on the 7th day of January, 1873, an assessment of fifteen (15) cents per share was levied upon the capital stock of said Company, payable immediately in United States gold and silver coin, to the Secretary, at the office of the Company, No. 323 Montgomery street, Room No. 10.

Any stock upon which said assessment shall remain unpaid on the 13th day of February, 1873, shall be deemed delinquent, and will be duly advertised for sale at public auction, and unless payment shall be made before, will be sold on Thursday, the 24th day of March, 1873, to pay the delinquent assessment, together with costs of advertising and expenses of sale. By order of the Board of Trustees.

JOSEPH P. MURSE, Secretary.
Office, Room No. 10, No. 323 Montgomery street, San Francisco, Cal. Jan-31

Piermont Milling and Mining Company—Location of works, Piermont Mining District, White Pine County, Nevada.

Norror.—There are delinquent upon the following described stock, on account of assessment levied on the 21st day of November, 1872, the several amounts set opposite the names of the respective shareholders, as follows:

Names.	No. Certificate.	No. Shares.	Amount.
Cohen, Henry.....	37	50	\$25 00
Cohen, Henry.....	51	10	125 00
Dickinson, E B.....	63	250	125 00
Fousier, Henry.....	24	750	375 00
Fousier, Henry.....	46	143	71 50

And in accordance with law, and an order of the Board of Trustees, made on the 21st day of November, 1872, so many shares of each parcel of said stock as may be necessary will be sold at public auction, at the office of said Company, on the 24th day of January, 1873, at the hour of 2 o'clock p. m. of said day, to pay said delinquent assessment thereon, together with costs of advertising and expenses of sale.

J. W. CLARK, Secretary.
Office, 418 California street, San Francisco, Cal. Jan-31

Quail Hill Mining and Water Company—Location of works, Calaveras County, California.

Notice is hereby given that at a meeting of the Board of Trustees of said Company, held on the 4th day of December, 1872, an assessment of ten dollars per share was levied upon the capital stock of said Company, payable immediately in United States gold coin, to the Secretary, at the office of the Company, No. 433 California street, San Francisco, Cal.

Any stock upon which said assessment shall remain unpaid on the 14th day of January, 1873, shall be deemed delinquent, and will be duly advertised for sale at public auction, and unless payment shall be made before, will be sold on Tuesday, the 4th day of February, 1873, to pay the delinquent assessment, together with costs of advertising and expenses of sale. By order of the Board of Trustees.

T. F. GRONISE, Secretary.
Office, 433 California street, up stairs, San Francisco, California. de 14

Sanderson Gold Mining Company—Location of works, Railroad Flat, Calaveras County, California.

Notice is hereby given, that at a meeting of the Board of Trustees of said Company, held on the 7th day of January, 1873, an assessment of ten cents per share was levied upon the capital stock of said Company, payable immediately in United States gold coin, to the Secretary of said Company. Any stock upon which said assessment shall remain unpaid on the 14th day of February, 1873, shall be deemed delinquent, and will be duly advertised for sale at public auction, and unless payment shall be made before, will be sold on Monday, the 24th day of February, 1873, to pay the delinquent assessment, together with costs of advertising and expenses of sale. By order of the Board of Trustees.

WILLIAM STUART, Secretary.
Office, 418 California street, San Francisco. Jan-31

Spring Mountain Tunnel Company—Location of works, Lincoln County, Nevada.

Notice is hereby given, that at a meeting of the Board of Trustees of said Company, held on the 17th day of December, 1872, an assessment of twenty cents per share was levied upon the capital stock of said Company, payable immediately in United States gold and silver coin, to the Secretary, at the office of the Company, No. 318 California street, San Francisco, Cal.

Any stock upon which said assessment shall remain unpaid on the 25th day of January, 1873, shall be deemed delinquent, and will be duly advertised for sale, at public auction, and unless payment shall be made before, will be sold on Monday, the 17th day of February, 1873, to pay the delinquent assessment, together with costs of advertising and expenses of sale. By order of the Board of Trustees.

J. M. BUFFINGTON, Secretary.
Office, 37 New Merchants' Exchange, California street, San Francisco, Cal. de21

Stanford Silver Mining Company—Location of works, Sierra District, Humboldt County, State of Nevada.

Notice is hereby given, that at a meeting of the Board of Trustees of said Company, held on the 3d day of December, 1872, an assessment of ten cents per share was levied upon the capital stock of said Company, payable immediately in United States gold coin, to the Secretary, at the office of the Company, No. 419 California street, San Francisco, California.

Any stock upon which said assessment shall remain unpaid on Saturday, February 8th, 1873, shall be deemed delinquent, and will be duly advertised for sale, at public auction, and unless payment shall be made before, will be sold on Monday, the 3d day of March, A. D. 1873, to pay the delinquent assessment, together with costs of advertising and expenses of sale. By order of the Board of Trustees.

CHAS. H. FISH, Secretary.
Office, Room 26, Hayward Building, 419 California street, San Francisco, California. Jan-31

Virginia Consolidated Mining Company—Location of mines: Kearsage Mining District, Inyo County, State of California.

Notice is hereby given, that at a meeting of the Board of Trustees of said Company, held on the 11th day of December, 1872, an assessment of two cents per share was levied upon the capital stock of said Company, payable immediately in United States gold coin, to the Secretary, at the office of the Company, 318 California street, San Francisco, Cal.

Any stock upon which said assessment shall remain unpaid on the 20th day of January, 1873, shall be deemed delinquent, and will be duly advertised for sale, at public auction, and unless payment shall be made before, will be sold on Monday, the 10th day of February, 1873, to pay the delinquent assessment, together with costs of advertising and expenses of sale. By order of the Board of Trustees.

T. B. WINGARD, Secretary.
Office, No. 318 California street, San Francisco, Room No. 13, third floor. de14-1m

Yule Gravel Mining Company—Location of works Viola, Claims, Township No. 3, Placer County, State of California.

Notice is hereby given, that at a meeting of the Board of Trustees of said Company, held on the 18th day of December, 1872, an assessment of twenty cents (20 c.) per share was levied upon the capital stock of said Company, payable immediately in United States gold coin, to the Secretary, at the office of the Company, Room 5 and 5, No. 302 Montgomery street, San Francisco, Cal.

Any stock upon which said assessment shall remain unpaid on Saturday, the 18th day of January, 1873, shall be deemed delinquent, and will be duly advertised for sale, at public auction, and unless payment shall be made before, will be sold on Monday, the 10th day of February, 1873, to pay the delinquent assessment, together with costs of advertising and expenses of sale. By order of the Board of Trustees.

WM. H. WATSON, Secretary.
Office, Room 5 and 5, No. 302 Montgomery street, San Francisco, Cal. de21

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Are now manufacturing besides the famous regular

GIANT POWDER, A NO. 2 GIANT POWDER,

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BANK BLASTING, COAL MINES,

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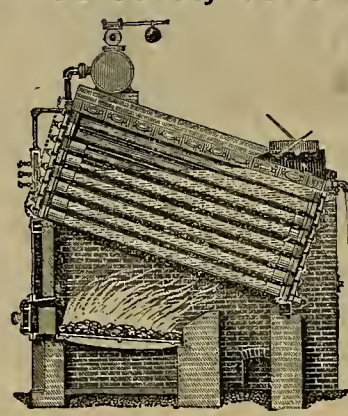
It is fully as safe as the other and evolves neither smoke nor noxious fumes when exploded.

Price. 50 Cents per Pound.

The sales of both grades increase very fast, which is the best proof of their superiority over other explosives.

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For all manner of uses.

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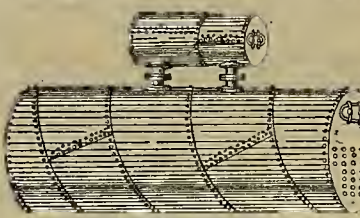
Virginia City, Nevada.

San Francisco Boiler Works,

123 and 125 Beale Street.....SAN FRANCISCO.

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High and Low Pressure Boilers of all Descriptions.

SOLE MANUFACTURERS OF THE CELEBRATED SPIRAL BOILER.

SHEET IRON WORK of every description done at the Shortest Notice.

All kinds of JOBBING and REPAIRING promptly attended to. 17v25-3m

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SPECTACLES.

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From the Mining Summary in the Gold Hill News of December 28th.

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GIANT POWDER

Circular.

GIANT POWDER has been in practical use on this coast about four years. The demand for it has increased to such an extent that it bids fair to become throughout the United States of America the universal Blasting Powder, if the enormous consumption in Europe, where it has superseded black powder nearly altogether, may be taken as a true criterion.

Since Mr. Nobel introduced his famous Dynamit, or Giant Powder, a number of different blasting materials have been brought to light; but in Europe all of these, without exception, have soon been thrown aside, not having the two great requisites combined—great power and perfect safety. It is an indisputable fact, that the mixing of two or more explosive substances, as, for instance, nitro-glycerine and black powder, increases the danger of either, if of the former enough he added to produce a powder of great strength.

Transportation of Dynamit (Giant Powder.)

For the sake of public safety, Railroad Companies in Europe have examined into the nature of these various blasting powders, and come to the conclusion to prohibit the transportation of all, with the exception of Dynamit, or Giant Powder. This powder having been pronounced perfectly safe, is now the only one allowed on railroads. As a proof, we copy the decree issued by the Austrian Government.

Decree of the Imperial Ministry of Commerce, Vienna, October 30th, 1869.

(Z. 21,371—3,767.)

To all Managers of the Railroads under this Department, relating to free Transportation of Dynamit on Railroads:

Late experiments having dispelled the fears of the Ministry of Commerce as to the explosiveness of Dynamit, which induced them to exclude this article from transportation on railroads and stages; and having conclusively proved that Dynamit (Giant Powder) is far safer than any other blasting material.

Now, therefore, the Ministry of Commerce has resolved to withdraw the decree of December 15th, 1868, (Z. 15,956) prohibiting the transportation of this blasting material known under the name of Dynamit (Giant Powder), and to allow such transportation under the following Rules and Regulations:

According to a communication to the Ministry of Finance, dangerous blasting materials, such as Dualin (a mixture of Nitro-Glycerine and Pyroxilin—i. e., Nitrate of Cellulose.) 2d. Lithofruteur (Hercules Powder, a mixture of Nitro Glycerine and black powder), have been imported into Austria under the false name of Dynamit, (a mixture of Nitro-Glycerine and non-explosives, for instance, silicate,) or as Nitrate of Salt.

The importation of dangerous blasting materials, under false names, being strictly prohibited, and Messrs. A. Nobel & Co. being the only firm entitled to make or vend Dynamit (Giant Powder) in Austria, therefore—

The Imperial Ministry, by a decree dated March 9th, 1870, calls the attention of its sub-departments at Prague, Lemberg, Innsbruck, Troppan, Linz, and Salzburg, to the fact that the above factory will attach their firm name to every package of Dynamit (Giant Powder), and that all shipments to Austria have to go through the Custom House at Zittau until further notice.

General Properties.

Giant Powder is an ungrained Powder, of a grayish brown color, with a specific gravity of about 1.

It is insoluble in water, and is not affected by time, or exposure to air or moisture.

It congeals at about forty-two degrees Fah. In the open air, or in ordinary packing, it burns without exploding.

Its combustion produces carbonic acid, oxide of carbon, hyponitrous acid and water.

Unlike gunpowder its explosion is instantaneous. The entire mass of Powder explodes as if it were a single grain. This quality, in connection with its extraordinary evolution of gases,

causes its explosive effect to be especially great in solid substances.

Its explosion produces carbonic acid, nitrogen, oxygen and water.

We beg leave to say to all those who have not yet tried or adopted the use of Giant Powder, that since its introduction in Europe, the consumption has increased so largely that the inventor and owners of this justly celebrated powder have been obliged to increase the number of their manufacturing to six or seven, which produce hardly sufficient powder to supply the ever-increasing demand. Two factories are in the north of Germany, one in Austria, one in the south of Germany, one in Italy, one in Scotland, etc. This, we believe, is the best proof we can lay before our friends of the great superiority of Giant Powder over every other explosive. This will show that it has been successfully introduced in ALL the different countries in Europe, and the increasing demand for the Giant Powder on this coast and in the Eastern States, where the company have erected extensive works, will soon make it the universal blasting powder throughout the world.

Since about two years a second grade Giant Powder, called No. 2, which is sold at one-half the price of the stronger grade, or No. 1, has been placed by the company on the market, and this also has been so favorably received by those engaged in blasting, that it is now largely used in medium and sandy rock, lime, marble, pipe-clay, and in coal, sulphur, cement, and gravel bank mines. Herein it stands as unrivalled as the stronger grade, or No. 1 Giant Powder, does in hard rock, iron, copper and submarine blasting. Its application is precisely the same as that of the stronger grade, and it is fully as safe.

In the United States the railroad companies are taking the matter in their own hands, and refuse transportation to all compounds condemned in Europe as dangerous, but transport Giant Powder.

Charging the Bore-holes.

You must bear in mind that to have satisfactory blasts it is essential that the charge is properly put in, and everything depends upon this. There is only one way, and this must be implicitly carried out, and never must any deviation be made from it.

Cartridges must be cut into 3 or 4 pieces, and each piece must be well rammed down with a wooden ramrod, so as to reach the bottom, and to be laterally spread out in the bore-hole; in order to do this thoroughly, we strongly recommend to cut the paper of each piece of cartridge lengthwise 3 or 4 times; in this way the powder can be easily spread in the bore-hole and the whole charge will form one solid mass. If this mode of charging a hole is scrupulously carried out, a satisfactory result may be relied upon. The instantaneous explosion of Giant Powder requires it to be solid in the hole and not surrounded by air, the elasticity of which would act as a cushion and weaken the effect of the powder. But when a whole cartridge is merely pushed down the bore-hole, no matter how closely it may fit in the same, experience has taught us that only a partial success can be gained. This most important procedure is often neglected, and we therefore cannot urge it too strongly on those who use this powder never to deviate from our directions herein laid down. When the Giant Powder is used in bulk or loose, only small quantities at a time must be rammed down the bore-hole to form one solid mass. To prevent the powder from adhering to the wall of the drill-hole, a tin tube with a funnel to it should be used, through which the powder is rammed down. It is maintained, with perfect truth, that Giant Powder, unlike black powder, breaks the rock below the bottom of the bore-hole, as well as at the sides. But to do this effectually, it must be brought in contact, not only with the walls of the bore-hole, but also with the bottom.

Firing the Charge.

The modes of exploding the charge are various. After the cap is put on the end of the fuse, and with a pair of nippers pressed firmly around the edge into the fuse, some grease or wax should be rubbed around the upper end of the cap to make the same air and water-tight. Now insert the fuse into the bore-hole until the cap rests on the charge; then take a small piece of a cartridge, about three-quarters of an inch, push it down with the ramrod and press it around the cap so that the latter is inserted in the powder to about half its whole length, but

never deeper, because if part of the fuse were in the powder, it would ignite the latter, and all the powder above the cap would be burnt up without exploding. Another way of exploding the powder is to cut off about an inch in length of a cartridge, smaller in dimension than the bore-hole, press into this piece of so-called priming cartridge the cap, after it is well fastened to the fuse, and with a string tie both together to prevent the cap from being withdrawn, then let this priming cartridge down the bore-hole until it rests on the charge, and fire the fuse. The object is to get the cap in some way into the charge of powder in the bore-hole. We believe tamping would be beneficial, especially in the use of No. 2 Giant Powder; but a tamping done merely with the ramrod is quite sufficient. The stronger grade Giant Powder frequently does not require any tamping, but whenever water tamping can be used, as for instance in all downward holes, it should be applied. It excludes every particle of air, and forms a solid column on the charge. This is an advantage which only Giant Powder possesses. Bear in mind this fact, the better the explosion of the cap by being tight on the fuse, the more complete is the explosion of the whole charge.

We advise all those who adopt the use of Giant Powder, to commence with large charges, and as they become more acquainted with its action to reduce the quantity at each blast, until the minimum quantity required to do the work is determined. In some kinds of rock a heavy charge is not as effective as a smaller one, but those who use this powder can best determine this themselves.

In some mines where this powder has been in successful use from the beginning, and where the monthly consumption is from 500 to 1,000 pounds, the amount for each charge has been reduced to about one and one-sixteenth ounces to each foot of hole drilled, the holes being one inch in diameter, made single-handed with three-quarter inch octagon steel and a four-pound hammer.

It is well known that black powder has but a limited power, and for this reason the bore-holes have to be so large as to require two men, and sometimes three, to drill each one. In Giant Powder you have an explosive from ten to twenty times stronger than black powder. Why then insist any longer on a large hole when a smaller hole, made with a light hammer by one man, and charged with Giant Powder, will do a much greater execution? Giant Powder explodes about twelve times quicker than ordinary powder; for this reason it works not only laterally in every direction, but also much below the bottom of the hole. As Giant Powder requires about one-half the number of men that black powder does, it meets, on account of this labor-saving quality, many enemies, especially in a country like this, where mine owners cannot always engage new men when the old refuse to adopt the new system of single hand-drilling.

That Giant Powder is superior to all other explosives, is even acknowledged by its most vehement opposers, from the simple fact that in wet ground those who still cling to the old powder use the Giant, the black powder being too troublesome, and of too little effect. For the same reason, besides others, all other lately invented explosives have been abandoned—Giant Powder stands alone as the explosive which can be used with the same facility in wet or dry ground, or under water.

If, therefore, Giant Powder is much superior in wet ground, it must be the same in dry, and only prejudice and ignorance are its enemies. If these can be overcome we can confidently leave its merits in the hands of those who have blasting work to perform.

Giant Powder is no exception to other labor-saving inventions—it has to pass through a certain ordeal, and then its full triumph will be universally acknowledged; then those who now oppose it will become its firmest friends, because they will perceive that it creates a demand for more labor, on account of its labor-saving qualities. This saving amounts to fully from 40 to 50 per cent. in all cases where this powder is exclusively used. Moreover, the hundred-fold greater safety of Giant Powder compared with black powder, as well as gun cotton and other explosives which appeared in Europe, but never came into practical use, will be fully appreciated, especially by those who handle it.

Nobody denies the enormous power which is possessed by Giant Powder. It therefore becomes the duty of every person using it to study its action and effect, and to select the proper places for bore-holes accordingly. It often requires differently located drill-holes from those for black powder, and for this reason even the most experienced black powder blaster must again study and learn, as he had to do with the ordinary powder, the correct application of this before he can expect to derive the fullest benefit. For instance, in tunnel work a horizontal hole in the middle of the face of the tunnel, in depth half its diameter, and charged with a heavy charge of Giant Powder, will clear a cone and expedite the work materially. Such hole should be at least 1½ inches in diameter.

In sinking shafts, stopping and drifting, full face single-hand drilling, as before described, should be introduced by all means. We cannot lay down positive rules for Giant Powder, nor are there such for black powder.

Temperature.

Consumers frequently forget that Giant Powder becomes hard by even moderate cold, and

when used in that condition, and the charges do not explode, the powder is blamed, while in reality the workmen are at fault. They should bear in mind the fact that below 42° Fahrenheit it congeals, and above 212° (the boiling point of water) it throws off noxious fumes. It should, therefore, be kept in some place having a temperature between these extremes. When frozen it can be easily thawed by being kept for a time in any warm place, and when it again becomes soft it is as good as before. As fire does not explode, but merely burns it, it can be kept without any danger in a house. We again repeat, never attempt to explode Giant Powder when it is hard, for you will not succeed.

Giant Powder in its Various Applications.

Giant Powder has proved as effectual and labor-saving to submarine blasting as in mines, and for railroad work. The procedure is indeed very simple. If submerged rocks are to be removed, all that is required is to take a box of Giant Powder in bulk, bore with a gimlet a hole in the box, fasten the cap well to the fuse and push the same through the hole, its length into the powder—never further—tighten the hole with wax or grease, light the fuse (which only requires sufficient length to allow the box time to reach the rock when sunk), and drop the same on the rocks to be removed. In this way the entrance to the San Francisco Dry Dock has been cleared of rocks, under the superintendence of the late efficient Engineer, Mr. Pollock. As much as 100 pounds, and even more, of black powder were lowered on those rocks and exploded, but nothing was effected except throwing up a handsome column of water. Then Giant Powder was tried, and a box of ten pounds lowered. This small quantity shattered the rock, which had withstood the ordinary powder repeatedly. Six-pound boxes were then used. These had still such enormous effect that injury to the masonry work was feared, and three-pound boxes were ordered, which in a short time successfully removed all the rocks impeding the entrance of vessels to the dry dock.

IN SULPHUR BANKS, where the black powder cannot be used, its slow explosion firing the sulphur, Giant Powder works with great success, its quick explosion preventing the ignition of the sulphur, as affidavits will show.

IN WOOD it generally works with great success. We will give the results arrived at in felling trees:

In an oak tree of from 19 to 20 inches in diameter, a horizontal hole was bored 10 inches deep and 1 inch diameter; this was charged with one-third of a pound of Giant Powder, and tamped with earth. The result was, that on the side where the hole was bored a cone was torn out nine inches deep and eight inches in diameter. The sides of the cone were crushed, and on the opposite side the tree had large cracks. If a second hole had been bored on this side about twelve to fourteen inches deep and two feet below the first hole, and charged with an equal amount of Giant Powder, the tree would have come down.

BLASTING STUMPS.—In the middle of a stump three feet in diameter, and only a few inches above the ground, a hole was bored 14 inches deep and 1 inch in diameter, charged with Giant Powder and tamped with earth. The result was, the stump was torn and rent so much that, with the assistance of a few gads, it was easily removed. On account of the toughness of the wood, a tamping is necessary, which could safely be done by a plug, through which lengthway a gimlet-hole is bored for the introduction of the cap with fuse attached.

Sinking Shafts and Wells.

Although we advise the introduction of single-hand drilling, being the means of great saving in expenses, we shall state the experience gained from parties who have successfully sunk wells and shafts by central blasts made with heavy charges of Giant Powder, proving a saving of more than 50 per cent. over the use of black powder.

In the center of the shaft or well a hole should be drilled from 50 to 70 inches deep, according to the hardness of the rock, and from 1½ to 2 inches in diameter, and charged with about 1 to 1½ pounds of Giant Powder.

The effect of such a blast will be an extraordinary one. The rock from the mouth of the bore-hole is torn like rags, and completely crushed, and can easily be taken out by hand labor. After the loose rock is removed, a few small blasts, with from ¼ to 1½ ounces Giant Powder will square the bottom again. One pound of Giant Powder breaks on an average from 130,000 to 150,000 pounds of rock.

Packing, Storage and Transportation.

The Powder may be packed, stored and conveyed in all the ordinary ways.

The fact that the Powder is explosive, naturally suggests the idea that it is dangerous; but it is in reality no more so than corn meal. Practically, it cannot be exploded by accident. It requires design and careful preparation to explode it. The only practical caution necessary is to keep other explosives away from it.

To remove all timidity, we will here state more fully the peculiar conditions for explosion.

Fire alone will not explode it, nor heat in any form—they will burn it to ashes, without exploding it.

Nor will any amount of mere weight upon it, or simple pressure of any kind, explode it. It cannot be exploded by any of the ordinary

movements, accidents, or incidents which attend its handling, transportation, or use.

The pressing it into cartridges, or ramming it into bore-holes with a wooden rod, however, hard, throwing it about, or jostling it in transportation, wagons, collisions of cars, or explosions of boilers, will never explode it.

But heat and pressure combined will explode it, provided they are of the proper kind and degree.

It is exploded by any violent explosion either in it or into it, whether of fulminate, nitroglycerine, Giant Powder, or other violent explosive. Such an explosion involves the peculiar percussive pressure and heat necessary. The burning or flashing of gunpowder unconfined is not sufficient.

Another method of exploding it is to set it on fire while under confinement in some tight and strong vessel.

The burning of the Powder produces gases which, finding no escape, at length cause a pressure so great as to produce, with the heat of the burning, an explosion of the unburned Powder.

By tight and strong vessels is meant iron retorts, quicksilver flasks, gas pipe, with caps screwed to its ends, and the like.

A vessel of the strongest tin has not the requisite strength; it, like cartridges of paper, ordinary packing boxes, barrels, casks, etc., will be burst asunder by the gases before the pressure is sufficient to cause explosion.

Important to Miners.

The Grass Valley Union of Nov. 20, 1872, states the following facts in regard to Giant Powder and single-hand drilling:

Good and honest skilled miners have been in demand, all over the State, for the last six months. The supply has not been equal to the demand. One mine in this county has advertised for men at advanced wages. We mean the North Bloomfield mine. The mine offering the advanced wages wants men who work single hand drills and with Giant Powder. It appears that single hand drills and the Giant do not knock down wages. The said drills and the said powder do not make the demand for miners any the less. On the other hand, more men are wanted now than ever before in the history of this part of the country, and better wages are offered. The usual effect of all improvements follows here, as it has always followed improvements everywhere and in every age of the world. Improvements in machinery or in material do lighten the burdens of labor and pay the laborer better for his light labor than he was paid when he had to toil the harder. The miners ought to begin to see that improved agents for production make a greater and a better demand for labor.

In Pipe-Clay Banks it is Invaluable.

A hole six inches in diameter, bored with an auger any desired depth into the face of the bank, and firmly charged with GIANT POWDER No. 2, will shatter the bank so thoroughly that no large lumps are thrown out, and again the expense of reducing these is saved.

Safety of Giant Powder in Transportation.

As neither fire nor any shock it may receive can explode it, it is as safe to carry as unexplosive merchandise. We never had any difficulty in shipping it on steamers, sailing vessels, railroads, teams, etc. Thousands of cases have been forwarded to the interior, to Nevada, Oregon, Utah, Colorado, Montana, Honolulu, Japan, Mexico and Peru, but never has a single accident happened. During nearly four years that this powder has been in market, and with the millions of blasts which have been made with it, judging from the amount of caps we have sold, we have heard of not one accident where the fault lay with the powder. Premature explosions, resulting from the powder being rammed down into the bore-holes, have never taken place. Practically, nothing but the Giant Powder Cap can explode it. It is so safe that charges of black powder placed on top of the Giant Powder in bore-holes, have never yet exploded the latter.

General Remarks.

From the resume given in the foregoing, it has been shown that Giant Powder has the following advantages over black powder:

A great economy in labor for boring.

Perfect safety in carrying, storing and handling it.

The quickness of explosion is so great that fissured rocks and clay are easily blasted with it.

Great saving in wear and tear of tools and in consumption of steel and fuse, fewer bore-holes being required.

In most cases no tamping, except with water or loose sand, is necessary. The loading is attended with no risk, but with a great saving of time.

In shouder blasting it is very superior, as a small charge of Giant Powder in a hole made with a half-inch drill will shatter the same to small fragments.

It offers an absolute security against explosions from fire, and is entirely insensible to shocks, falls and knocks, as they happen in transportation.

The gases are not injurious, and permit of much quicker work underground.

In the working of mines, quarries, open cuts, etc., it is so much superior that it must, in almost all cases, take the place of black powder.

The saving in expenses are from 30 to 60 per cent. in favor of Giant Powder, the gain in time

from 40 to 70 per cent. This last advantage in many cases is of incalculable value.

In the opening of quartz and coal mines, in running long tunnels and sinking shafts through barren rock, the saving in time must naturally be of great importance, in reaching so much quicker the fortunes to be unearthed.

For submarine blasting and wet ground work, Giant Powder has become indispensable.

It has proved of great importance and enormous advantage in warfare, removing palisades, blowing up of bridges, etc., and for many other purposes. Lastly, in many cases, where black powder is of no avail, Giant Powder will prove very effective.

Considering all these advantages, which Giant Powder possesses, we are well warranted in asserting that the speedy introduction of Giant Powder for the whole civil and military technic is much to be desired.

A fair trial never fails to prove a complete success. The first blasts are conclusive as to its enormous power, but its full economical value can only appear when experience is gained and no waste of powder is allowed.

We give below the opinion of the press, a number of testimonials from private parties, and the results of some interesting experiments made some three years ago by order of the Austrian government with Giant Powder, or Dynamit (as it is called in Europe), gun cotton, and black powder, and shall add only a few more words about the relation of Giant Powder to gun cotton, including in regard to the latter, the improvements made in England in the same.

The strength of gun cotton of equal volume with Giant Powder is, notwithstanding the great compression, very much inferior to that of Giant Powder.

In equal holes it is impossible to introduce the same power of Giant Powder and gun cotton. Giant Powder will always have the advantage of from 30 to 40 per cent. It follows, therefore, that the expenses of boring the holes for gun cotton must be much greater, the gain of time in blasting much smaller, than with Giant Powder. It is not likely that this proportion can ever be materially changed, as it is conditional on the aggregate proportion of nitro glycerine and the cotton fibre.

Gun cotton has the same disadvantages for submarine blastings as black powder, or any explosive mixed with black powder.

We respectfully subscribe ourselves your obedient servants.

NO. 2. GIANT POWDER.

A combination of Giant Powder and other substances, producing a large volume of gases when mixed and exploded, has proved it, in practical use, of so great merit that the sales of this compound are continually increasing, it being well adapted for medium hard rock, bank-blasting, coal mines, etc.

In its explosion it is slower than the regular Giant Powder, but for this reason it tears the rock more and reaches further.

This powder is as safe in every respect as the other, and nearly as strong.

It sometimes gets hard in the cartridges, when exposed to extreme heat, but this does neither injure nor weaken it. When hard, it can be very easily pulverized or softened again, by rolling the cartridge a few times with the foot, or striking it a few sharp blows with a stick. There is no danger whatever in doing this.

The Giant Powder is so safe, that without the Giant Powder Caps it is almost impossible to explode it.

Use only OUR GIANT POWDER CAPS; others are not reliable.

This grade of Giant Powder is used in the same manner as the No. 1, with the single exception (that greater care should be used in charging wet holes, the No. 2 being more susceptible to the effects of water); however if in wet holes a primer of No. 1 is used, it insures, beyond all question, the efficacy of the blast.

The strength, in both grades of Giant Powder, can never be destroyed by any atmospheric influence, and if treated as before described, it always recovers its full power. This is another advantage it has over all other explosive powders.

In bank blasting, the great crushing power of No. 2. Giant Powder renders it far superior to all others. It not only throws, but completely pulverizes the bank, rendering washing much more easy, and preventing any gold from being carried over the dump in unbroken lumps of cement or gravel.

BANDMANN, NIELSEN & CO.,

General Agents.

210 Front St., S. F.

Interesting Trials, Showing the Relative Strength of Giant Powder, Gun Cotton and Black Powder.

The most interesting and especially important trials for the Military Engineer with Giant Powder against wooden objects are those conducted by the Military Engineer Corps of the Royal Prussian Garde Pioneer Battalion against palisades. The results of these trials are taken from a certified copy of the official protocol, and comparisons of the effect of Gun Cotton in blasting, having also taken place in Vienna, conducted by the Military Corps of Engineers, returned from Schleswig-Holstein:

A.—Blasting of obstruction; palisades being twelve inches diameter; round posts, eleven feet long, three feet in the ground, and three inches apart.

1. GIANT POWDER.—FIVE pounds placed in a single bag, hung two inches above the ground.

RESULT.—Three palisades broken off close over the ground, and an opening produced of three feet eleven inches in width.

2. BLACK POWDER.—FIFTY pounds in a box, placed at the foot of the palisades.

RESULT.—Two palisades broken, one close to the ground, and the other one and one-half feet above the ground, and two palisades pushed somewhat to the side; width of opening produced, three feet two inches.

3. GUN COTTON.—A barrel with TWENTY-FIVE pounds placed against the palisades; firing by electricity.

RESULT.—Four palisades broken close to the ground; of the next two some splinters broken off; opening produced, three feet and seven inches. Hereby must be remarked that these last palisades were placed close together, with an earth-bank thrown up against the same on the other side, a circumstance favorable to the result.

B.—Blasting of a double row of palisades close together with an earth-wall thrown up against the same. Palisades pointed, twelve inches in diameter, eleven feet long, three feet in the ground; second row, or breast palisades, from six to eight inches thick.

1. GIANT POWDER.—SEVEN pounds, packed as before, simply in a bag.

RESULT.—One breast palisade broken off three and a half feet above the ground, two pointed palisades broken off two feet above the ground. Of a third pointed palisade there remained but a small piece standing; opening produced, three feet.

2. BLACK POWDER.—SEVENTY pounds in a strong box placed against the palisades on the ground.

RESULT.—One pointed palisade broken off two feet, and one breast palisade two and one-half feet above the ground, two palisades pushed to the side. The opening made was not passable, the palisade burning faintly.

3. GUN COTTON.—Pointed palisades, twelve inches diameter, twelve feet long, and three feet in the ground; breast palisades from five to six inches diameter. For blasting were taken two barrels, each containing TWENTY-FIVE pounds gun cotton, placed fifteen feet distant from each other, and separated by a two feet high earth wall; simultaneous ignition by electricity.

RESULT.—Each barrel tore away three pointed palisades behind them, which produced one opening of four feet and one of four feet six inches.

The result of these six trials is:

First.—The effect of FIVE pounds of Giant Powder, by single obstruction palisades, placed loose in single bag, is equivalent to FIVE TIMES the weight of gun cotton, and TEN TIMES the weight of black powder, provided the two latter materials are put in cases with a strong resistance.

Second.—Against defective palisade works SEVEN POUNDS of Giant Powder, in a loose inclosure (a bag) have a much stronger effect than TEN TIMES the quantity of black powder in weight enclosed in strong boxes, but a little less effect than TWENTY-FIVE POUNDS gun cotton in a package with strong resisting powers.

C.—A changed trial of the above described Prussian defensive palisade works.

The enormous but comparatively local effect on the Giant Powder proved in the former trials that a much more favorable result would be obtained by a more proper distribution of the Giant Powder to the nature of the object to be operated upon. For this reason the following trial was made:

A common gas pipe, twelve feet in length and one and a half inches in diameter, was filled with EIGHT AND A HALF POUNDS of GIANT POWDER, soldered at one end and closed with a common cork at the other. This gas pipe was hung against the palisades horizontally, two and a half feet above the ground.

The Giant Powder was exploded by a cap and fuse. The explosion was an instantaneous one, notwithstanding the considerable length it was distributed, and fired only at one end.

RESULT.—Three palisades, with the breast palisade behind them, broken off at one and a half feet above the ground; of a fourth, only a small part remained standing; three others fell over as soon as touched, and two more broke off and fell to the ground on being pushed. One breast palisade broke off one and a half feet above the ground. There remained standing in the length of twelve feet only three palisades and three breast palisades.

This trial is very convincing proof what enormous results can be arrived at when the Giant Powder is properly applied. If ten pounds had been used, very likely the whole length of twelve feet palisades would have been knocked down.

Very characteristic of the fearful effect of the Giant Powder was the circumstance that the gas pipe was broken into numerous very small pieces, and which had such enormous velocity that they penetrated the palisades like shot.

In regard to the former trials and those made afterward, a strong inclosure, in which the Giant Powder was placed, was hardly necessary. The Giant Powder distributed in a canvas hose would have been sufficient.

The probability to do away with the necessity of confining the Giant Powder in strong vessels, is of very great importance in using it for

military purposes. In this way useless weight is not alone saved, but the danger avoided to the friendly troops being wounded by flying pieces.

This danger was especially a very great obstacle in the Austrian army, from using the barrels made of Bessemer steel.

BANDMANN, NIELSEN & CO.,

General Agents

Of the Giant Powder Company.

Experiments made at the Company's Works, Showing the Relative Strength of the Two Grades Giant Powder and Black Powder.

[From the S. F. Mining and Scientific Press.]

The Giant Powder Company, of this city, instituted recently several very interesting experiments at their works (on the Treat Tract on the Central Road) at which a number of prominent citizens, gentlemen interested in mining, and members of the press were present. The object was to show clearly that the article they manufacture is greatly superior and absolutely much cheaper for blasting and like purposes than common powder, and that its use is unattended with danger when ordinary care is exercised.

To prove the first point, comparative tests were made of the force of each article in projecting shot from a mortar. The mortar was elevated 45 degrees, and a 32-pound cylindrical shot was fired by charges of blasting powder and of Giant Powder. Of this last the Company manufacture two kinds: "No. 1," the ordinary kind, according to Nobel's patent, and "No. 2," a weaker compound (whose ingredients are not given), the property of the company, much cheaper than No. 1, and intended for use in certain kinds of rock where an excess of powder is not required. No. 1 costs \$1 per pound, and No. 2, fifty cents.

In these experiments the charges were 8 grammes of each powder. The blasting powder threw the ball 17½ feet (mean of two experiments); No. 2 Giant Powder 410 feet, and No. 1 Giant Powder, 545 feet.

Next, the shot (now a 32-pound ball) was thrown vertically in the air from a mortar, whose bore was of sufficient dimensions and shape to hold only the lower half of the shot, around which a loose packing of sand was poured. The charges were now 30 grammes—about one ounce. The blasting powder merely blew out the packing; No. 2 threw the ball about 486 feet, and No. 1 about 788 feet up in the air. The time was taken by several gentlemen. The No. 1 charge also burst the band around the mortar.

The horizontal fire gave, as the comparative projecting force of the mixtures, the proportion of 1 to 23½ to 30½. From the vertical fire we can make no proportion, as the common powder did not even lift the ball out of the mortar. The distances to which the ball was thrown by No. 1 and No. 2 were as 1 to 1.6. These experiments show how much more powerful is the Giant Powder, and hence that, other things being equal, from the much greater work done, it must be a more economical agent. It seems to us that it must come into very extensive use, if the matter of attendant danger can be settled satisfactorily. The next experiment was to show that the powder cannot be exploded by fire, and that ordinary care will obviate all danger. The company claim that, in all accidents known to them, the cause has always been simply carelessness, and never attributable to the powder.

A five-pound box of the Giant Powder, out of which about half a pound had been taken and exploded by fuse on a log, which it shivered to splinters (this being done merely to satisfy all that the contents of the box actually was Giant Powder), was closed up, as when prepared for transportation, and placed in a fire of brush and twigs. When the box had been burned through, the powder caught fire and burned, like fire in pyrotechnic displays, without explosion. This proved conclusively that simple heat will not explode the mixture.

With the properties of nitro-glycerine no one is yet fully acquainted. Yet the composure with which the officers of the company stirred up the fire in the last experiment showed that they had not the slightest fear of danger from burning the Giant Powder (which they would perhaps term nitro-glycerine rendered harmless), and the result justified their confidence. In regard to accidents at factories, Mr. Bandmann said that the majority occurred by a desire to economize by saving the sulphuric acid, which, after being used, is washed out from the manufactured nitro-glycerine. This is very apt to retain some of the nitro-glycerine, and hence the accidents. On this account, this company does not use further the acid which has been once employed. The nitro-glycerine once mixed with the other ingredients to form Giant Powder, no further danger is feared. A proper degree of caution, however, is never superfluous.

Bank Blasts with No 2 Giant Powder.

On the 22d May, 1872, 2,500 pounds No. 2 Giant Powder were placed in the cemented gravel bank on the Dutch Flat Water Company's ground at Dutch Flat, Placer County, owned by Bradley & Gardner. This blast was calculated for 400 kegs of black powder. Result: More ground was moved and shattered than 1,000 kegs of black powder could have done.

The Second Great Bank Blast.

Took place on the 26th June, 1872, at Gold Run, in Messrs. Taylor & Harriman's claim. Result: A brilliant success; 3,500 pounds of No. 2 Giant Powder were used, and swept out the bottom and threw and broke the bank back of the claim line. Amount of bank broken and thrown, 200,000 cubic yards.

Giant Powder at the Sandwich Islands.

In Honolulu harbor a large rock had to be removed from the boat landing of the Kohala Plantation, which common powder failed to remove. We insert a letter received from there, which speaks for itself:

HONOLULU, March 31, 1869.

I have tried two or three blasts with the Giant Powder upon the rock at Kohala Plantation Landing, with wonderful success. It is a very powerful agent, and we shall soon have the whole rock removed.

In practice, particularly under water, it is a hundred fold better than common powder.]

Respectfully,

(Signed), SAMUEL N. CASTLE,
For Kohala Sugar Co.

We will state that in blasting under water, the cartridges as they are used in mines, can be taken, a cap with fuse attached inserted in the powder, a little weight attached to the same and laid on the rock. Such a cartridge with Giant Powder, can lay for hours under water, and remain effective, as the water does not injure the powder.

The bottom of the Stockton channel, consisting of hard and tough pipe-clay, covered with some feet of mud, was ordered to be deepened. Holes were bored into the clay, and with a great deal of trouble black powder introduced, but it had little or no effect, it being too weak for this purpose, and could not break the tough pipe-clay or cement. Giant Powder was then ordered, and the manner in which it was applied is as follows: After the dredging machine had scraped off the mud, a hole of about three feet in depth was bored with an auger into the pipe-clay, and a tin tube put down into the bore-hole, a common paper cartridge of Giant Powder pushed through the tube to the bottom of the hole, then a priming cartridge, with a cap and fuse inserted, until it rested on the charge. The tube was then withdrawn and the fuse ignited. Each blast did its work effectually. In this way the channel was soon lowered to its required depth. The clay, which was all crumbled and broken into small pieces, was afterwards removed by the dredging machine.

Testimonials.

RATTLESNAKE CANYON, August 26, 1869.

GIANT POWDER COMPANY:

Dear Sirs:—At the request of C. W. Gilbert, agent of Giant Powder at Downieville, we cheerfully answer certain questions propounded by you. The bank in our claim is composed of hard cement for the depth of about seventy feet, and then comes hard pipe clay, into which we bore horizontally a six-inch hole, the distance of twenty-six feet, requiring two men three days to bore and blast, into which we put 100 pounds of your powder, which cost (laid down here) \$129; wages, \$18—total, \$147. It seemed to raise the mountain about one foot, and it then settled back again. It did more execution than we could expect—far, far beyond what we thought it could, and far beyond our most sanguine expectations. It tore the ground in all directions for a space of seventy-five feet on each side of the blast, and broke large boulders into numerous pieces. One boulder in particular, that was twelve feet through, which was in sight on the face of the bank, and at least thirty from the powder, was crumbled into pieces; in fact, the whole bank is crumbled. We do not want the bank down, it would be in the way; but we are satisfied that when we get water out this winter, it will wash down with ease, as it is now one mass of crumbled matter. The blast did a great deal more benefit than one we put off last fall, requiring four men six weeks, day and night, and fifty kegs of black powder, costing nearly \$600. In fact, it is impossible for us to describe the great result of this 100-pound blast; a person must see it in order to realize the great action caused by your powder. We intend, in three or four weeks, to put off three more blasts this fall; two of 100 pounds and one of 200 pounds, and will expect great results. If they do as the last did, it will be the greatest invention of the age in blasting pipe clay, and will make our mines worth thousands; with black powder they are worthless.

Yours truly, HUGHES & FLINT.

DOWNIEVILLE, August 27, 1869.

MESSRS. BANDMANN, NIELSEN & Co:

Gents—I send an elaborate report from Messrs. Hughes & Flint, which you can rely on as correct, and, as they say, it is impossible to tell the great result. Persons not interested say that to step on the top of the bank it seems that you would go down. I hope the next blast will prove a success; if they do, it will make a great change in blasting. That was the great

reason for parties selling out there—there was no way to get the pipe clay out of the way. Messrs. Hughes & Flint bought a good deal more ground.

In haste,

C. W. GILBERT.

(From the Mining and Scientific Press, January 16, 1869.)

SAN FRANCISCO, January 16, 1869.

EDS. PRESS:—As a matter of some interest to the owners of mines, I beg to lay before your readers some facts connected with the use of Giant Powder in the Oakes and Reese mine, in Hunter's Valley, Mariposa County, belonging to Messrs. Robinson & McAllister.

We have used the powder entirely since last April. In its use the steel consumed is of uniform size—three-quarter inch octagon. Hammers (short handles) weighing three and a half pounds. The country rock is hard and tenacious. The veins of quartz are narrow, varying from ten inches to three feet, generally running from one foot to twenty inches in width, with little or no gouge.

The system which Mr. Cassel, superintendent of the mine, has introduced (and which can only be used to advantage with Giant Powder), is to pay the miners by the foot in depth of hole drilled; the miner doing no blasting, nor does he handle any rock, his simple duty being to drill holes where instructed.

The underground superintendent, or head blaster—one for each shift—instructs the miner where to drill a hole. When the hole is drilled to the depth required, the superintendent measures it and takes a memorandum of the same and sets the miner at work elsewhere. As soon as the hole is measured the blaster loads it with from 2 to 2½ ounces of loose powder, fills the hole with water, covers it, and leaves it until the men leave it at the time of shift. As soon as the men have left the mine, this blaster with his fuses, with cap or exploder attached, makes his round, and removing the cover from the hole, drops the fuse into the hole, works the exploder into the powder, which is quite soft, fires the fuse, and in a very few minutes will explode all the holes drilled during the working shift. As soon as the explosions are made, the rock men and skip men clear away the debris which may be in the way of drilling new holes, and when the men again come into the mine there is work for them ahead in drilling. A blast is only fired when the men are at work on the mine when it becomes necessary to remove material. Thus it will be seen that no time is lost in blasting.

My experience since April last leads me to know the following facts in the use of Giant Powder as against gunpowder:

FIRST—The amount of work which can be performed in a given space in a mine is nearly double.

SECOND—The consumption of steel is about one-half.

THIRD—The consumption of hammers is about one-half.

FOURTH—The consumption of candles is about one-half.

FIFTH—The width of the drifts or stopes is only about one-half, requiring so much less material to be removed or hoisted from the mine.

SIXTH—The mining timbers are of shorter length.

SEVENTH—The ore raised from the mine is broken by the force of the powder, so as to require less spalling for this mill.

EIGHTH—The progress of the work in the mine is expedited a least 40 per cent., and in wet mines (the progress is increased full 50 per cent., if not more).

The miner's pay roll for the mine during October was only \$2,429.03, and during this time this force not only kept the 12-stamp mill busy day and night, but the yield of ore from the mine has so increased that another battery is now being erected of four stamps more—sixteen stamps in all. These sixteen stamps could not be kept employed from the mine, with common powder, short of a pay roll of \$8,500 to \$9,000 per month. Thus much for the use of Giant Powder for the owners of the mines. Now comes the advantage to the miner.

The miner never incurs any danger from the use of the powder, as we have never met with an accident in its use, and is never injured in the hands from a careless striker, and when the miner is used to this powder, and understands its peculiarity and great safety, he returns to the use of gunpowder with reluctance. It may be as well to state that I never heard of any trouble caused by sickness or disease in the use of this powder in the mine.

So far as the miner is concerned, he can earn more money with a three-quarter inch steel and small hammer than in any other way. It is true he must earn his money, and is not paid by the day. The price paid in the Oakes and Reese mine is 37½ cents per foot of hole drilled. In October there was drilled 6,476½ feet of hole, costing \$2,429.03. The following list will exhibit the amounts earned by miners most expert in the use of single-hammer drills in October—27 working days:

P. Belci.....	\$130 20
L. Bolvia.....	124 33
J. A. Wilson.....	131 77
B. Kendall.....	163 77
S. Cox.....	122 25
S. Uran.....	130 74
B. Picard.....	104 56
H. Laffy.....	\$97 30
F. Gill.....	94 66
F. Lastrade.....	90 72
J. Fortuna.....	84 50
H. Boyle.....	81 77
J. Martin.....	90 49
L. Battola.....	84 93

and many others ranging below the above amounts, falling short either because not work-

ing full time, or from not being expert in the use of the single hammer. Still, any system of mining where a miner willing to work can earn as high as \$131.77 per month, of twenty-seven working days, must insure to the benefit of the miner, and particularly so when the mine owner is willing to pay such wages. One thing is certain, that with Giant Powder and the use of small steel and hammers, the miner must earn his money, and cannot shirk his work, as is too often the case under the old system of mining.

(From the Mining and Scientific Press, January 20, 1869.)

Additional Facts.

SAN FRANCISCO, Jan. 25, 1869.

EDITORS PRESS:—Noticing in your paper of the 16th, a communication having reference to the use of Giant Powder in the Oakes and Reese mine, belonging to Mr. McAllister and myself, I beg to state that during the past week our superintendent, Mr. Cassel, has let the following contracts for work on the mine:

1. Sinking the main shaft 50 feet from the 278-foot level, at \$60 per foot—contracting parties furnishing everything.
2. Drift west, on Oakes and Reese vein 50 feet, at \$13 per foot—contractors furnishing everything.
3. Drift south, 50 feet, at \$10.75 per foot.

The same work has heretofore cost us, with the use of black powder, as follows:

1. Sinking main shaft, \$90 per foot.
2. Drift west, Oakes and Reese vein, \$30 per foot.
3. Drift south, Blue Lead, \$25 per foot.

Thus it will be seen that in these three contracts the mine owners save as follows:

1. Sinking 50-foot shaft \$30.....	\$1,500 00
2. West drift, 50 feet, at \$17.....	850 00
3. South drift, 50 feet, at \$14.25.....	712 50
Total saving.....	\$3,062 50

In addition to the saving in dollars and cents, it is also the important item of saving in time, as the time occupied in finishing contracts with Giant Powder is only about one-half the time required with use of ordinary powder.

The contractors, even at these low rates, are better satisfied with the prices than under the old prices with the common powder.

Very respectfully,

L. L. ROBINSON.

Here is a testimonial from a Cornish gentleman:

Having for eighteen months used Giant Powder in the Dana Tunnel, near Dayton, State of Nevada, I take pleasure in saying that I never, in all my experience as a miner (of twenty-six years standing), used a more effective or cheaper blasting agent, for the amount of work done, nor do I recollect experiencing the least ill-effects from its use. I heartily recommend its use.

SAMUEL RICHARDS.

SUTTER CREEK, Cal.

SMARTSVILLE, April 14, 1869.

MESSRS. BANDMANN, NIELSEN & Co., San Francisco.

Gents—The steel has got here and stands the rock first rate. I have got eighteen men on Giant Powder, on the hardest face, where they made 10 feet in a month with black powder, working six men. We made 9½ feet in thirteen full days with six men. That shows some improvement. Will probably make 16 feet in a month when the men get used to the single hand drilling.

It has been hard to get men to drill single handed; it makes their arm sore at first, and they have to lay off some.

R. L. CRARY, Superintendent.

[Extracts from some few newspapers.]

CORRESPONDENCE.

The weekly Colorado Herald, of December 31, 1870, has the following:

Economy of Giant Powder.

Some time since, in an article upon this powder, we mentioned our desire to give any facts that could be furnished by those using Giant Powder, that would tend to show its value in comparison with ordinary black powder. Mr. Womack has furnished us a statement which comes to the point exactly. There are probably not many mines in the country where the difference would be equally great. The Seaton is particularly adapted to the use of the single-hand drill. The work spoken of in the following statement, was foot, or under-hand stoping. One man worked with single hand drill, and two other good miners worked opposite to him. The result was as follows:

FIRST DAY'S WORK.

One man fired five charges of Giant Powder, bored eight feet of ground in soft rock, and used four cartridges. The cost of each cartridge was 30 cents. Total cost of powder first day, \$1.20. Cost of labor first day, \$3.50; cost of labor and powder, \$4.70; the cost of double-hand drilling, two men, \$7.00; powder, 60 cents; total \$7.60. Amount of work performed by one hand hammer equal to same work previously performed in the same time by two men with large drills, using black powder, in the same kind of rock of the same drift, saving \$2.90. Gain, 38 per cent.

SECOND DAY'S WORK.

One man fired five charges of Giant Powder, bored eight feet of ground in ordinary rock,

used two and one-half cartridges. Cost of powder 75 cents; cost of labor and powder, \$4.25. The cost of double hand work, \$7.60. Amount of work performed equal to double hand work; saving, \$3.35. Gain, 44 per cent.

THIRD DAY'S WORK.

One man fired seven charges of Giant Powder, bored thirteen feet of ground in ordinary rock, and used eight cartridges. Cost of powder, \$2.40; cost of labor and powder, \$5.90. The cost of double hand work, \$7.60. Amount of work performed, one-third more than by double-hand drilling. Value of extra work, \$2.53; saving, \$4.23. Gain, 55 per cent.

FOURTH DAY'S WORK.

One man fired seven charges of Giant Powder, bored ten feet of ordinary rock, and four cartridges cost \$1.20. Cost of labor and powder, \$4.70. Cost of double drilling, \$7.60. Amount of work performed, one-fourth more than by double-drilling. Value of extra work, \$1.90; saving, \$4.80. Gain, 63 per cent. Saving in four days, \$15.28. Gain, 50 per cent.

Time occupied to drive drift and stopes on No. 2, Seaton Mine, 25 feet long, two and a half feet wide, 10 feet deep, twenty-three days of nine hours each. Cost of labor, \$80; powder, \$16; caps, \$2; fuse, \$3; candles, \$3.80. Total cost, \$105.30. Cost per foot, \$4.30. Cost of same drift by double-hand drilling, \$8.40 per foot.

Giant Powder at Grass Valley.

From the Grass Valley Union, of the 11th of April, 1872, we copy the following statement of the Supt. of the Eureka mine on the relative merits of Black and Giant Powder:

GIANT AND BLACK POWDER.—It is well known that six men have been engaged in the Eureka mine, for the last month in running a cross-cut, and that these men have been using Giant Powder as a blasting agent. During the month the six Giant Powder men made forty feet, the rock through which they ran being very hard in some places and not so in any spot. In the five months previous an average of twenty-one feet per month was made with black powder and double drills. The men working Giant Powder have not been sick a minute during the twenty-six days they have been working in the cross-cut. Three of the men who worked with the Giant Powder were green hands at underground mining. We are furnished with the following statement which compares the cost of using the two kinds of powder:

STATEMENT.—In regard to the trial between Black Powder and double hand drill, and Giant Powder and single hand drill, in the cross-cut of the Eureka mine: Six men with double hand drill and Black Powder in five months drove one hundred and five feet, or twenty-one feet per month. Six men with single hand drills and Giant Powder drove forty feet in one month at a cost to the Eureka Company as follows:

Double hand Drill, expense per month, \$491 20	
Single hand Drill, expense per month, \$573 45	
Cost per foot Giant Powder and single hand drill.....	\$14 33
Cost per foot Black Powder and double hand drill.....	23 30
Or a saving in favor of single hand drill and Giant Powder of 38½ per cent.	

Giant Powder in Placer County.

By permission of the Bellevue Mining Company, near Newcastle, we publish the following statement:

Experiments with No. 2 GIANT POWDER, single hand drilling, versus Black Powder and double hand drilling:

East Drift—with black powder—9 days,	
2 men at \$3.00 each.....	\$54 00
90 candles—15 lbs., at 20 cents.....	\$3.00
Black Powder and Fuse.....	2 25 5 25

Made 6 feet cost per foot.....	\$59 25
East Drift—with No. 2 GIANT POWDER—6 days, 1 man at \$3.00.....	\$18 00
No. 2 GIANT POWDER—6 lbs at 50 cts. 3 00	
Fuse and candles—3 lbs.....	3 60

Made 6 feet cost per foot.....	\$24 60
Saving in favor of GIANT POWDER.....	\$4 15
per foot, or 58 per cent., besides the saving in time.	5 74

FRED'X JONES, Supt Bellevue Mine.

NEW TESTIMONIALS.

VIRGINIA CITY, Dec. 27, 1872.

MESSRS. BANDMANN, NIELSEN & Co.,
General Agents Giant Powder Co.

Gentlemen—In answer to your inquiry in regard to the efficiency and saving. Giant Powder possesses over black powder, I herewith state, that I have been using the Giant Powder since three years, and find in its use a saving of 50 per cent. over black powder. I consider the Giant Powder much safer than any powder I have ever used. JAMES G. FAIR,
Supt. Hale and Norcross Silver Mine.

NEVADA CITY, Cal., Dec. 20th, 1872.

OSCAR W. WHITE,

Traveling agent Giant Powder Co.

DEAR SIR:—In reply to your request, I would state that I have used Giant Powder for the last two years, and find it a saving of fifty (50) per cent over black powder. Yours truly,

J. H. HELM.

Supt. Gold Tunnel Mine.

NEVADA CITY, Cal., Dec. 20th, 1872.
OSCAR W. WHITE,
Agent Giant Powder Co.:
DEAR SIR:—In compliance with your request that I give you a statement as to the saving made by using Giant Powder in the Nevada Quartz mine, I would state that it is fifty per cent cheaper than black powder.
Very truly yours,
JOHN BERRY,
Supt. Nevada Quartz Mine.
We shall from time to time publish facts and figures from all the prominent mines on the Pacific Coast in relation to the merits of the Giant Powder.

MESSRS. BANDMANN, NIELSEN & Co.,
General Agents Giant Powder Co.
At your request I herewith state that I have been using the Giant Powder since a long time in the Amador Mine, Sutter Creek, and consider the Powder a great saving over black powder. It is the safest explosive I have ever used.
JOHN A. STEINBERGER,
Supt. Amador Mining Co.
Sutter Creek, Jan. 4, 1873.

Important to Railroad Contractors.

Having stated in the foregoing circular the number of manufactories owned exclusively by the inventor, Mr. Nobel and his partners, we have recently received from this firm the information that a tunnel through parts of the St. Gothard mountain in Switzerland, has been decided upon. This work, it has been calculated, will take eight years to finish. A partner of Messrs. Nobel & Co., Doctor Bandmann, made the first blasts at this contemplated tunnel with Giant Powder, or Dynamit, as it is called in Europe, and met with such success that the managers of this gigantic work, Messrs. Favre & Co., concluded at once negotiations to supply them with this powder for the whole work.

The Giant Powder has also recently been successfully introduced in the Hoosac Tunnel, in the State of Massachusetts, where, until then, nitro-glycerine and other explosives have been used.

In conclusion, we will add that in our neighboring State of Nevada, the "Sutro Tunnel Company" are using the Giant Powder, and find it the best and most labor-saving blasting material.

In all the deep mines on the Comstock lode in Nevada, Giant Powder has been used since its introduction without injurious effect to a single miner.

The rapidly growing favor which Giant Powder finds with all who are engaged in blasting on this Coast, and in the Eastern States, is its best recommendation.

BANDMANN, NIELSEN CO.,

210 Front Street. SAN FRANCISCO.

Rain Fall.

As an evidence of the difference in respect to the moisture of the earth this year from what it was last, we have a striking illustration in the reservoir of the Contra Costa Water Company. Last year it required a fall of twelve inches of rain to fill the reservoir. This year, with an additional height of fifteen feet, the reservoir was filled by a rain fall of only six inches. We judge by this that six inches of rain the present year is equal to twelve last. That is, the earth had become so thoroughly dried by the three years drought, that it required a rain fall of six inches to put the earth in the same condition, in respect to moisture, that it was the present year before any rain fell. The earth in this State is like a sponge, retaining the moisture as a reserve power to meet the exigencies of dry seasons. The hot sun and dry atmosphere acts as a powerful attraction, forcing the moisture from the lowest depths to the surface. The three dry seasons had about "wrung the sponge dry," and the reason of the great amount of water which the earth absorbed last year, and the heavy fall of rain necessary to make any perceptible rise in the streams and fountains. There is a scientific principle connected with this incident which we turn over to the University professors and students for further elaboration.—Oakland Transcript.

COFFEE.—Having succeeded in producing the growth of nearly all the kingdoms of Europe and States of the Union, growing more wheat than the Northwest, taller corn than Indiana and Illinois, higher trees than Maine, and larger onions than Connecticut, rivaling with her crude young vineyards the vineyards of the old Rhine, and the world-famous champagne districts of France, giving pampered fashion a more delicate silk than Italy, the protan and fertile Golden State is now embarking in coffee culture; and her enterprising and energetic sons tell us that in a few years their "cafetals" will produce more and better coffee than all the old countries of the earth put together. And it is more than likely that the Californians will keep their word in the matter, for they have never yet broken a promise of this kind, and in imagination we may confidently picture California coffee prized above "Java" and "Mocha" in the great Continental Exhibition of 1867.—Phil. In.

DEWEY & CO., American & Foreign Patent Agents,

OFFICE, 338 MONTGOMERY STREET, S. F.

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A well-constructed model is generally first needed, if the invention can well be thus illustrated. It must not exceed 12 inches in length or height. When practicable, a smaller model is even more desirable. Paint or engrave the name of the article, and the name of the inventor, and his address upon it.

Send the model (by express or other reliable conveyance), plainly addressed, to "DEWEY & CO., MINING AND SCIENTIFIC PRESS OFFICE, SAN FRANCISCO." At the same time, send a full description, embodying all the ideas and claims of the inventor respecting the improvement describing the various parts and their operations.

Also send \$15 currency, amount of first fee of the Government. The case will be placed on our regular file, the drawings executed, and the documents made up, and soon sent to the inventor for signing.

As soon as signed and returned to us with the fees then due us, it will be sent straightway to the Patent Office at Washington.

When the invention consists of a new article of manufacture, a medicine, or a new composition, samples of the separated ingredients, sufficient to make the experiment (unless they are of a common and well-known character), and also of the manufactured article itself, must be furnished, with full description of the entire preparation.

For Processes, frequently no model or drawings are necessary. In such case, the applicant has only to send us an exact description, and what is desirable to claim.

For designs no models are necessary. Duplicate drawings are required, and the specifications and other papers should be made up with care and accuracy. In some instances for design patents two photographs, with the negative, answer well instead of drawings.

For further information, send a stamp for our illustrated circular, containing a digest of PATENT LAWS, 112 illustrated mechanical movements, and HINTS AND INSTRUCTIONS regarding the RIGHTS AND PRIVILEGES of inventors and patentees, which will be furnished post paid. Also a copy of NEW PATENT LAW of 1870.

DEWEY & CO.,

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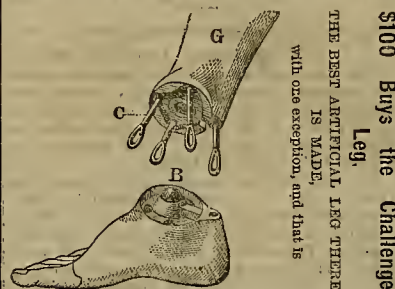
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BY DEWEY & CO.,
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SAN FRANCISCO, SATURDAY, JANUARY 18, 1873.

VOLUME XXVI.
Number 3.

The Great Industry of the Pacific Coast.

While recognizing the fact that the agricultural resources of California are apparently unlimited, and that from them the majority of the people of the State gain their daily bread, there is no doubt but that the basis of the wealth of the States and Territories comprising what is familiarly known as the Pacific Coast, is in the mines. During the past year the mines have produced in solid bullion the enormous sum of \$62,236,914, of which California alone is credited with \$19,049,098. The product of the year shows an increase over that of 1871 of \$3,952,884. Does not this prove material progress and advancement, and augur well for the future? The history of the past few years has been a history of successive advances each more marked than the last, and we have no reason to suppose that this progress will be stayed.

It was not many years ago when the hardy pioneers who first braved the dangers of the plains and rugged mountains looked down upon a field magnificent, but wild and unexplored. Could their visions of the future of the lands upon which they looked, golden as they were, have been half as bright as the realization has proved to be? Could it have occurred to them that the placid streams on which they gazed with wondering eyes, would be turned aside and their beds laid bare by men in search of gold; that the magnificent towering mountains and broad hills would be compelled to disgorge their hidden treasures in countless millions; that the deep cañons through which fretful streams burst their way would be pierced by the bare-armed miner in his search for polished gold in the hidden beds of ancient rivers? If these thoughts should have passed through the minds of those brave men, it is impossible, we say, that they could have predicted half of what has come to pass.

If we look back upon the struggles of the early pioneers and mark the steps they made, we can but wonder at the energy and industry displayed, even under the most powerful incentives of industry—gold. True, mining enterprises in those days were of a rude and temporary character, and little science was used in the processes then in vogue for the extraction of the precious metals, but we owe them much, for we of late years have profited by their hard-earned experience, for which, to tell the truth, we give them less credit than they deserve.

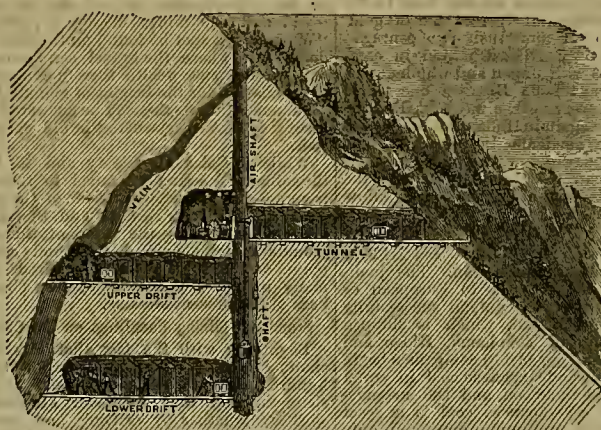
Our mining interests are now being developed on a grander scale than has ever been witnessed. It has been proved that by judicious and economical management mining will pay a handsome profit on the capital invested, and this fact is now acknowledged by all. The great developments on the Comstock lode in deep levels, has encouraged owners of heretofore unproductive, but promising mines, to prosecute work with more vigor and with better chances of success. What is true of these mines will probably be true of many others yet unknown to fame. A great number of domestic mining incorporations have been formed, and considerable foreign capital has been invested in our mines. Smelting-works have been erected in "base-metal" districts, improved mills and furnaces constructed and in operation, and ditches and reservoirs dug to increase water supply.

In fact since the advent of the first miners to this coast the whole business of mining has been revolutionized. Steam hoisting apparatus has superseded the old system of whims,

and steam pumps have taken the place of buckets and hand pumps. Wire tramways for the transportation of ore from mine to mill are rapidly being introduced and have proved successful. Railroads make transportation cheaper and enable mines to be worked that would otherwise be idle. Giant Powder has done its

manufacturers, makes people progressive, assists the national finances and makes the country prosperous and powerful. England's example is one for us to follow in this matter; her mines have increased her wealth and importance and created manufactures and commerce. Russia and Germany both owe much to their

Fig. I.

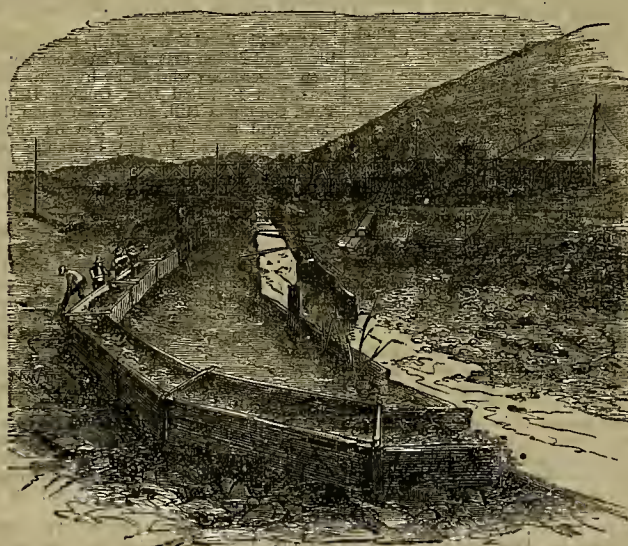


VERTICAL SECTION OF A QUARTZ MINE.

share in simplifying and cheapening mining operations and has in reality proved a boon to the hydraulic, as well as the quartz miner. Diamond drills are used in certain localities with great effect and will no doubt be consid-

mines, and fully appreciate the fact. We on the Pacific coast know the importance of this industry better than those in other States, and recognizing it, endeavor to foster this particular branch in as great a degree as possible.

Fig. II.



MINERS AT WORK ON A BAR.

sidered more necessary mining implements, for prospecting purposes in ten years from now, than they are at present. The Stetefeldt Furnace, improved stamp mills, the chlorination process, amalgamating pans, settlers, patent rifles, quicksilver, patent hydraulic nozzles, safety cages and other appliances too numerous to mention have sprung from the necessities of the day, and assist in increasing the profits. New mining districts are being prospected and developed, and new and beneficial laws are in vogue. The advance which has taken place has materially assisted the manufacturers of the coast and increased the market for home productions.

The mining industry creates commerce, helps

portion of the shaft below the tunnel is called a winz, from near the bottom of which the miners are seen running another drift, or "gallery" (as such a work is usually called,) to strike the vein at a lower depth.

Fig. 2 represents miners at work upon a "bar" upon the bank of a river. Flumes have been laid from a point up the river, whence the water can be easily taken out, and as the gravel is thrown in and washed, the flumes are gradually moved further and further from the river until the bar is "worked out."

At the present time our quartz mines are worked by steam hoisting and pumping apparatus of intricate and expensive workmanship; tramways are laid in the levels and adits; the cages for hoisting the ore are constructed with great care to avoid accidents, and thousands of improvements have been made which would astonish a "49'er" who had not before seen them. The gravel which once required stamps to crush it is now torn to pieces by the use of water, and the wonderful forces applied tears the rocks and fractured boulders to pieces almost instantaneously. How different from the days when a tin pan and a pocket knife, or a rocker and shovel were the tools of a miner.

We have a bright future before us too, as well as a past, and as gold hunting will always be an object of ambition, a thousand hills, rich in their inexhaustible supply must yet give up their treasures. Millions of tons of ore yet to be extracted will be delivered at metallurgical works yet to be erected. Still more perfectly and cunningly devised machinery and appliances will economize our expenditures and increase our profits. Millions of tons now useless will be utilized. Railroads threading our mountain cañons will help to populate the State. Products now not searched for will be made articles of commerce. Besides our gold and silver we shall mine more extensively for copper, iron, platinum, chromium, gypsum, nickel, porcelain clay, arsenic, antimony, quicksilver, sulphur, lead, tin, bitumen, coal, marble, salt, borax, etc., etc., and as fast as such one of these mineral products are brought to light, the demand for them will increase, and manufacturers be created to add yet more riches to our favored country.

AIR BRAKE.—A series of experiments are being made in England with the Westinghouse air brake which has proved so effective in this country. Our cousins appear to be a long way behind the age if they have just begun to recognize its merits. At one of the trials the rails were in bad condition, being greasy with a drizzling rain, but with the aid of this brake a train traveling 50 miles an hour was brought to a standstill in 18 seconds, and in about 175 yards.

ALASKA GOLD.—There is an excitement in Sitka over the recent discovery of a quartz lead, the ore from which is reported rich in gold. It would not much surprise us if Uncle Sam's newly acquired property would turn out a good mining region when it is thoroughly prospected. Good coal has been found there in considerable quantities, and we have heard of gold discoveries before this one, but as far as we know, no steps have been taken to prove the value of the locations beyond mere assays.

MECHANICS' ARTS COLLEGE LECTURES.—The second lecture of the course being delivered before the Mechanics' Arts College was delivered on Saturday evening last, by Professor D. C. Gilman on the "Physical Structure of the United States in Reference to its History." The lecturer explained how the great natural divisions of the country influenced colonization and was, interesting throughout.

The two cuts shown on this page are typical of the mining interest on the Pacific slope. By glancing at them and comparing the reality of our operations as they now are, we can realize the stride taken in the past twenty years.

Fig. 1, we will remark for the benefit of such readers as may be unacquainted with such operations, represents an ideal section of a quartz mine. The vein is shown upon the left, growing wider, as it increases in depth from the surface. A shaft has been sunk, which cuts the vein near the surface. A tunnel has been driven into the hill to intersect this shaft, and just below the intersection a drift has been run from the shaft to the vein, where the work of taking out rock has been commenced. That

CORRESPONDENCE.

Japanese Mines and Minerals Again.

EDITORS PRESS:—A reporter of the MINING AND SCIENTIFIC PRESS did me the honor on the 23d ult. to call and examine my collection of Japanese minerals. As that gentleman arrived rather late in the afternoon, and seemed to be in a great haste, his examination and his hastily taken notes were consequently incomplete; and in reading your insertion "Japanese Minerals and Mining" in your next issue I find that in two or three cases, I must either have misunderstood the questions of your reporter, or he must have misunderstood my answers.

From 1864 to 1869 I traveled in Northern Asia, visiting the Ural mountains, the Altai, Western and Eastern Siberia, the watersheds of the Obi, Yenisei and Lena, Northern Mongolia, the Amur countries, Northern and Eastern Mandshouria and Kamtschatka. On the first of June, 1869, I embarked in Nicolajefsk at the mouth of the Amur, and after having touched the Russian ports of DeCastri, Olga Bay and Wladivostok on the coast of Mandchouria, I arrived in Hakodadi, island of Yeso, Japan, on the 28th of June, and in Nagasaki on the 19th of July. From the day of my arrival in Nagasaki up to the end of November 1869, I visited parts of the island of Kiou-Siou and the Goto-land across the Kiou-Siou Bay, Hiogo and Osaka on the Great Nippon, and the surrounding countries to a distance of, from 25 to 30 miles. On the 25th of November I entered the service of the Japanese Government at the Imperial Academy in Yeddo, and during my two years service I profited of all the College vacancies and of nearly all the holidays, to go on longer or shorter exploratory excursions into the country, the adjoining provinces of To-Otomi, Soubo-Inga, Ksi, Izon, Sagami, Mousssi, Simoosa and etc.

After I left the Government service, I made a few other excursions into the Webster islands, the island of Thoshima, Kamakura, and others, so that my travels in Japan may have occupied in all, a little over 10 months, about a year as I stated to your reporter; the word "about" was omitted in your article. Again I beg leave to observe that I have not visited all the accessible parts of Japan; as for instance, Nagata is a port, open to foreigners, which I have never had occasion to visit. On the other hand, I have, by special permission of the Japanese Government, visited countries beyond the treaty limits, as Odowara, Atami, Ashy-Noyou and the Hakoni mountains, where I made important observations, and found a rich harvest for my collection.

With regard to placer gold being frequently brought in for sale, I beg to say that it is not exclusively to English traders, but to foreign traders in general, that such offers have often been made. In the few cases, which came to my knowledge, (the gold having been handed over to me for assay) the traders were not English but merchants of other nationalities. The words "to English traders" might induce the readers of your Scientific columns to believe that English merchants in Japan had a sort of monopoly in this line of business, which is not the case at all.

Alum could be exported from Japan in considerable quantities, if its exploitation was carried on in a more rational footing, which is however not the case yet.

Japan as a Mineral Region.

Japan is one of the richest mineral regions on our globe, and may—once all its treasures laid open—well rival with the Ural mountains, with California, Mexico or any of the rich mineral states of South America. Besides the riches represented in my collection, there are strong indications that the mountains in the North of Nippon, which, from 38° N. N. up to the Arv-Mori Bay 41° N. N. divide the territories of Mutsu on the East and Dowa on the West are rich in auriferous quartz, and that the placer gold, often clandestinely offered for sale, is found in the tributaries of the Fia-Ami-Karwa, a river which takes its source on Mount Yvayasi, 40° N. N., runs along the east chain of mountains and opens into the Eastern Sea of Japan near the island of Fugami 38° 40' N. N. Many rich mines of different metals and other useful minerals also, as graphite, lime, white and red chalk, red and yellow ochre, realgar, opment, elastic bitumen, Iceland spar, fluorite spar, talc in different shapes and qualities, alabaster, meerschaut, purrolane, etc., are known to exist in the interior of the country, but are not worked yet, or only very imperfectly by the peasants, who only work on the surface when they have a day or two to spare from the works in the rice plantations, but never take the trouble to go deeper, where the best qualities of minerals are found.

Although the regular and rational working of these mines, either by concession to Japanese

or foreign capitalists or by exploitation for the Government's own account under the management of a foreign engineer, would beyond any doubt greatly and rapidly improve the finances of Japan, as well as the social condition of the working classes, in procuring permanent work for thousands of homeless and friendless razzias, (poor outcasts), who during the cold season are often seen by half doze dying of hunger and cold on the wayside of the Toocaido between Yeddo and Yokohama—strange and deplorable cases of revolting misery in a country of so great agricultural and mineral riches, and so flourishing a commerce—yet the Japanese Government hesitate to open the mineral treasures of their country, for fear, perhaps, of too great an influx of foreign immigration, which would cause political trouble in the country. Let us hope, however, that the present liberal Government of Japan, who have declared themselves so open and firm for social progress and civilization will soon have subdued the few reactionary elements in the Empire and be free after to carry out without reserve or fear of internal political troubles, the great reforms, which are necessary yet to make Japan a truly rich, civilized and well-governed country, worthy to take its social and political standing among the civilized countries of Europe and America.

Copper Mines.

The provinces known to day to be the richest in mineral wealth in Japan, are the provinces of Satsuma, Figo and Fieen on the island of Kiou-Siou, the provinces of Kanga, Mino, Bizen and Kafi, on the Great Nippon and the little island of Sado near the west coast of Japan. The best and richest copper mines are located in Kiou-Siou. Japanese copper has been known for centuries as the best in the world. It contains a fine percentage of gold. The Dutch, who for more than two centuries have been the only civilized nation in commercial relations with Japan and who had permission to export from Dessima one whole cargo of copper every year, always smelted the Japanese copper again in Holland and extracted the gold by an amalgamating process. The Japanese of our days know the value of their copper better than their ancestors, and take the gold out of it themselves before they allow it to go to the market.

Coal.

Japan has already several great coal fields in full and systematic exploitation. The qualities, although inferior yet to European or American coal, begins to contend successfully with the Australian coal, which is shipped yearly to the ports of Yokohama, Hiogo and Nagasaki. Several steamship companies begin to mix Australian and Japanese coal in equal parts and find the fuel good, and the arrangement profitable, as Japanese coal is a great deal cheaper than Australian coal, and only very little inferior in quality to the latter. Deep shafts have been sunk now on several rich strata, and better qualities found than before. I know about the existence of two more promising coal fields with rich strata, which are not worked yet, and there may be many more, known, perhaps, only to a few peasants in the neighborhood.

Fine Kaolin and a fine bluish clay abound, especially in the southern part of Nippon, in Kiou-Siou and Sitokki. These two minerals furnish the material for that fine and almost transparent Japanese earthenware, so much admired, and exported to all parts of the globe.

Geological Formation.

The whole Japanese Archipelago is of volcanic geological formation. Many of the smaller islands consist only of lava, obsidian and pumice stone; on the larger ones, taken in a totality, almost all the geological formations are represented, as seen in my collection. Active volcanoes are at constant work yet in the south and in the north of the country; those in the centre are all extinct and the craters of the Fusi-yama and the Hakoni mountains afford ample material of study for the geological explorer. Earthquakes are very frequent in Japan, especially between the equinoxes, but never so violent as to cause great damage.

Japan has already two navy yards with dry docks, one in Nagasaki, and the other in Yokozaka, a few miles distant only from Yokohama. Yokozaka, under the direction of an able French engineer, has its foundries and extensive, well supplied workshops, where the engines and boilers are made for the steamers that are built in their yards. Several new steamers have been launched in Yokozaka; among others the "Kome," a fine paddle-steamer with a first rate engine, plying daily between Yeddo and Yokohama. The works and yards in Yokozaka are being enlarged for the construction of men-of-war.

Japanese Progress.

Yeddo and Yokohama will soon strip off what remains to them yet of their old Asiatic plegm, and become lively European or American cities. The two towns have their railway, their running steamers, their telegraph and etc. The streets of Yokohama are already lighted with gas, and those of Yeddo will soon enjoy the same advantage. In a few months the Yeddo will have its horse cars on rails throughout the whole town, and Yokohama will have the same only a few months later. The Japanese, men and women, are rapidly doing away with their Mongolian dresses and customs and adhere to the newest fashions of New York or Paris. Many fine buildings of modern architecture embellish the Japanese quarters of Yeddo and Yokohama, the old heavy nommons also are gradually disappearing and fashionable buggies,

landaus and light hackneys take their places. Japan is on its way to modern civilization, and no reactionary movement would be powerful enough now to stop it in its progress.

Yours, very respectfully, J. KADERLY.

"The Ancient Channels."

[Written for the Press.]

Much has been said and written on the subject of the ancient river beds, or, as they are more properly termed by some writers, "The Dead Rivers of California." Theories have been set up and each writer has taken pains to demonstrate his own particular theory.

One writer says the Dead River extends from Plumas county on the north to El Dorado on the south. Another that it rushes from the northern part of Sierra county to Smartsville, in Yuba county, and still another, that it runs in a northwesterly direction from Dutch Flat to North San Juan.

I do not propose in this article to contradict any of these theories, but simply adopt the idea upon which all appear to harmonize, viz: That a vast channel does exist and that traces of a dead river are too numerous to admit of a doubt as to its former existence, and wherever found it furnishes abundant proof of its own genuineness and the uniform richness of the gravel with which it is filled.

The question whence it came or whither it went, may be very interesting to the geologist or the antiquarian, but to the commercial world and the miner the great problem is, "Where can a spot be found on the line of this dead river where the gravel can be removed and the immense wealth therein contained set in circulation for the benefit of mankind?"

In general terms this can be answered by the assurance that everywhere the old channel is rich.

While in Calaveras county and El Dorado the miner is hoisting the gravel to the surface from a depth far below the beds of the present streams; in Placer, Nevada and Sierra counties he is conveying the waters of the highest mountain streams in ditches and canals to points on the same channel hundreds and in many instances thousands of feet above the beds of the present streams.

Prominent Mining Localities on the Channel.

Beginning with the fact that this ancient channel is filled with gravel from fifty to seven hundred feet in depth, of almost unvarying richness, and that wherever systematically worked, whether by drifting and crushing, sluicing or hydraulicing, it has paid the miner for his labor uniformly in proportion to the amount of gravel washed. The next question is what is the most profitable way to work it, and what localities afford the greatest facilities for extracting the gold from the gravel?

At Smith's Flat, El Dorado county, and at Ohili Gulch, in Calaveras county, the channel has been worked for many years; but being below the present stream beds, the gravel has had to be hoisted by steam or water power, which left but a small margin for the miner—still it paid.

At Gold Run, Forest Hill, Bath, Michigun Bluffs and Dutch Flat, in Placer county, it has been successfully worked by hydraulicing.

At You Bet, Red Dog, Quaker Hill, Blue Tent, Columbia Hill, North San Juan, French Corral and Smartsville, in Nevada county, it has been worked by the hydraulic process though more scientifically and on a much larger scale than at the former places.

The Formation.

All these mining operations develop the fact that the auriferous deposit contained in this channel, throughout its entire length and breadth, is composed of gravel mixed with clay, sand and boulders. The strata differing from each other in color and the size of the boulders and gravel, as well as in richness; the richest stratum being nearest the bed rock. The color of these strata is a deep blue at the bottom, fading gradually to a bluish gray toward the surface, and in exposed places assuming a reddish tint showing the presence of iron; the blue coloring of the lower strata being caused by the decomposition of vegetable matter buried among it, there being great quantities of petrified wood of all varieties found all along the channel.

In the channel proper the gravel is very compact and can be washed clean only by "air slacking," crushing or by the use of powder. The latter has proved to be the most successful method yet adopted. A few hundred kegs of powder will shake up a large bank of gravel which will then wash easily, and the miner can remove it very rapidly by hydraulicing.

Necessary Facilities.

The proper facilities for this class of mining are not found in every mining region along the old channel. On the contrary, there are comparatively few places where we find all the essentials for a successful mining operation combined. There are three things necessary to constitute a good hydraulic claim: first, a good bank of pay gravel; second, a plentiful supply of water; third, a good "dump" or outlet for tailings and other debris from the claim. Many of the places named above possess the first two of these requisites, and lacking the third, fail to pay half so well as other claims of no greater richness, but possessing a good dump.

At no point along the line of the old channel are these requisites more prominently observable than at Blue Tent, the point where the old channel is cut by the South Yuba river. Its depth and extent of gravel deposit, its facilities for a plentiful supply of water, and more particularly its dumping privileges are second to none in the State. The first is practically inexhaustible; the second will fail only when the South Yuba ceases to be an outlet for the eternal snows of the Sierras, and the third is afforded by a steep mountain side, seven or eight hundred feet of which intervene between the bed of the old channel and that of the South Yuba.

Need of Capital.

Up to a recent date the ground has been divided into small claims and worked at great disadvantage with small heads of water. These interests have gradually been consolidated till they are at present owned by four or five companies, who control not only this vast body of gravel, but also all the water rights, outlet, timber, etc., necessary to work it. Some of the claims are now being fitted up for working on a much larger scale than ever before and will no doubt make a good showing this season. But what is wanted here is a company possessing the capital to make one gigantic mining scheme out of this whole set of claims; bring in a ditch carrying five or ten thousand inches of water; run a tunnel sufficiently low to tap the hill to its center (which actual survey shows to be less than a thousand feet to where such a tunnel would strike the channel) and otherwise fit up this immense claim on a scale commensurate with its merits. We hope to see this done at no very distant day.

NEVADA.

The Sulphur Banks of Lake County.

These are situated near the shore of an eastern arm of Clear Lake, about eleven miles from the town of Clear Lake and one and a-half miles from the celebrated borax lake, from which they are separated by a ridge of mountains. The sulphur is found in a decomposed, volcanic rock, which is very much fissured; from these fissures issue the steam and hot gases which deposit the sulphur. The gas is most abundant toward evening, at which time it is impossible to stay in the "work holes" for any length of time, on account of the excessive heat and suffocating nature of the gases, which appear to issue at irregular intervals; for while examining some of the fissures containing sulphur, we could work for some minutes without inconvenience, when suddenly there would be an escape of gas, which would nearly suffocate us, causing dizziness and a desire to get out into the open air as soon as possible. These gas-escapes seem to have a fatal effect on quail and hares, as we found several dead in the fissures. They probably select these warm places on cold nights, and are killed by the noxious gases.

Evidence of solfatara action are evident along a line extending from the shore of the lake S. E. for more than half a mile, though the sulphur banks worked do not extend to half that distance. There are a number of mineral springs on the line of the "banks" among them soda, alum and borax springs.

One cavity, opened in working for sulphur, which we called "The Devil's Testkettle" resembles the "Witch's Cauldron" at the Geysers. The water is not so hot, but it keeps up a continual sputtering, and makes about as much noise as the "Cauldron." One of our party took one look at it, and concluded he had got enough of the sulphur banks, and was quite anxious, like the Tentonic gentleman to "drive on," thinking like him, that the Satanical regions were "not var vrom dis place."

On the border of the Lake near the reducing works is a hot spring containing borax, used by the Indians of the neighboring rancheria for washing the borax and the heat doing away with the necessity of using soap; the hot water and gas (carbonic acid) percolate up through the sand over an area of perhaps 100 feet square, part of the outlet being beneath the Lake. Localities can be selected of any desirable temperature from that of the water of the Lake to a temperature too hot to hold the hand in. During a recent stay of several days in the neighborhood, this spring was a source of comfort to our party, being an excellent washing place on cold mornings. The company owning the banks are taking steps to ascertain whether the springs can be utilized as a profitable source for obtaining borax; a well has been sunk some 50 feet from the works and 150 yards from the Soda Springs; strong borax water was struck at a depth of 18 feet.

Mr. Wm. Murdock has charge of the property; he employs six men and reduces something over two tons of ore per day; two furnaces are in use, and one out of repair. The retorts which will reduce about 200 tons before being renewed cost \$500 each at the works; wood costs \$3 per cord. When looking on while the workmen were "drawing" the furnaces it required but a very little stretch of the imagination to think one's self in the Lower Regions. There are other deposits of sulphur in that county and vicinity, of which more anon.

L. G. YATES.

Centerville, Cal., Dec. 25th, 1872.

FALL RIVER has 1,206,928 spindles, 27,498 looms, and an invested capital of \$27,000,000.

MECHANICAL PROGRESS.

The Use of Zinc.

In France, Belgium and Germany, the area of roofing annually covered with zinc is from 40,000,000 to 50,000,000 sq. ft., and the experience of 50 years shows that it forms a perfectly sound and nearly imperishable roof-covering. In England its use is unpopular, if we may use the expression, and mainly, we think, because the principles upon which it should be used are yet hardly understood. When first introduced, about the early part of the present century, there were no English workmen who thoroughly comprehended the nature of the material with which they had to deal, and a special knowledge is absolutely necessary.

In the first place, the expansion and contraction of zinc under atmospheric influences are greater than those of other metals in ordinary use. Copper, which is very efficient, but rarely used on account of its cost, approaches it most nearly, but the expansion and contraction of zinc is *pro rata*, nearly one-third more than that of copper. Therefore in the construction of drips, laps and other uniting points, it is necessary that, while being sufficiently sound to keep out the weather, a certain "play" to use the technical phrase, should always be allowed. Any attempt to solder together a zinc roof into one homogeneous body is certainly followed by buckling, cracking and failure, and this was a fruitful source of trouble in the earlier transactions.

Another mistake made was, that the zinc was used too thin. The process of oxidation which this metal undergoes is peculiar. The rusted surface does not rub off or blow away, but forms a sort of hard crust of enamel upon the surface of the metal, and, when laid upon boarding which is or may become damp, or exposed to steam or condensation below, it rusts on both sides. The thin zinc first introduced into England in this way were rusted through they then became brittle, and failure was the result. But if the zinc be of sufficient thickness, after a certain period of time oxidation ceases, and we have a body of solid, sound metal, encased above and below by a solid coating thoroughly impermeable to the accidents of weather or temperature, and which requires no painting. To give the exact figures described in the trade, No. 9 gauge is too thin, and perishes. No. 14 gauge may be generally recommended as sufficient.

There are various ways of laying the zinc. First, it may be laid in a corrugated form without boarding, the trusses of iron or wood of the roof carrying the weight; or one may lay it in what is called the Italian style, or rafter about 1 ft. more or less apart, with a corrugation at each rafter only; or in a third manner, upon a general surface of boarding, in the manner of a lead flat, the necessary drips, ridges, etc., provided for in the construction, with the extra allowance for expansion and contraction which the peculiar nature of the metal requires.—*The Architect.*

SOLDERING IRON AND STEEL.—Dr. Sieburger publishes the following methods for soldering iron and steel:

If large and thick pieces of iron and steel are to be joined sheet copper or brass is placed between the perfectly clean surfaces to be united, which are then tightly wired together. The joint is covered with wet clay free from sand, and dried slowly near the fire. When the mud is dry, the joint is heated by a blast to a white heat and cooled, suddenly if iron, slowly if steel. When brass is used, it requires less heat, of course, than copper.

For objects of moderate size, hard brass solder is made by fusing together 8 parts of brass and 1 part tin. Soft brass solder is composed of 6 parts brass, 1 part zinc, and 1 part tin.

For soldering small iron or steel articles, a hard silver solder composed of equal parts of fine silver and malleable brass is used, the mass being protected by borax. Soft silver solder differs from this only in the addition of 1-16 part tin.

Very fine and delicate articles are soldered either with pure gold or a gold solder composed, of 1 part gold, 2 parts silver, 3 parts copper.

FLOUR WITHOUT MILLSTONES.—Another device for making flour without the use of millstones is being put to a practical trial in England. The grain is crushed by one thousand little trip hammers attached to the proper machinery to produce the result desired. The machinery is said to be very cheap, doing up its work in a most scientific manner, and flour produced is said to be far superior to that obtained by grinding. A pounding mill costing one thousand dollars, will produce as much flour every day as an old-fashioned mill costing \$5,000. The new mill is very simple. When a hammer is out of order you can replace the same with a few cents. For four thousand years millers have produced flour by grinding the grain with stones. What will be the result of the modern attempts to do without grinding stones remains to be seen.

Concrete in London.

The London *Architect* has some pertinent observations on the uses of concrete for building purposes, from which we quote the following:

We are convinced that both for the sake of building cheaply and building well, we shall see before long a wonderful alteration in the mode of using bricks. We go on making the lumps of burnt clay we call bricks in the way we do, chiefly because it has been the fashion to make these lumps in some regular form ever since men began to build, although modern science has long ago pointed out to us much cheaper and better methods of employing both lime and clay.

A brick wall as it is put together now-a-days, with its multiplicity of small joints, and its liability to consist either of porous, underburnt bricks, or friable, loamy mortar, can hardly escape becoming saturated with moisture every wet day, and retaining for the longest possible period the water used in its construction. But why make bricks at all? We can burn the clay in heaps with small coal, and burn it thoroughly, to incipient vitrification, for one-third the cost that we can burn it in the form of bricks; and we can make the chalk mixed with clay into a water-resisting cement for very little more than the expense of converting it into lime.

There can be but little doubt that concrete, carefully made from these materials and cast into hollow blocks a twelvemonth before it is wanted, might be a cheaper material, and a better one in every way, than those we are now using. Constructed of such blocks as these, we might obtain substantial, damp-proof houses ready for occupation directly they were built, with the advantage of hollow walls, out of which the moisture had evaporated before they were put together.

Then, our plastering again; it seems hardly credible that we go on daubing our walls with the miserable, crumbling, rotten stuff generally used for the purpose, while the best material we have ever had, the "patent fibrous plaster," made in large slabs to screw against the quartering of battens, requires no laths, can be fixed by a carpenter in half the time of common plastering, perfectly dry, at a cost, battens and all included, less than ordinary three-coat plaster work.

Any invention of this kind has, however, to encounter a fearful amount of prejudice and dislike, and a process tending, as this did, to alter the practice of an entire branch of trade, has very little chance of success.

Houses need not necessarily be damp, and we could avoid this evil by altering our present mode of building. Any change in existing systems can, however, only be brought about by the most imperceptibly slow degrees, unless, indeed, some powerful and united action be induced, either by Government legislation, or by awakening the public to the sense of the evil of the present system.

ALLEGED IMPROVED ROTARY PUMPING ENGINE.—A large pumping engine has been more than three years at work at the lead mines of Bleiberg, near Aachen, in Rhenish Prussia, and as its economical results are highly satisfactory, it begins to be imitated in other mining districts. It is a Woolf compound engine, and was constructed at Seraing by M. Kraft, of that famous establishment. The peculiarity of this engine is that the steam cylinders do not act directly upon the pumps, but through a crank shaft with fly-wheel upon a balanced beam, to which the pump rod is attached in a parallelogram. The engine makes on an average 3½ strokes per minute, though it has been worked with ease 8½ strokes. The economy of coal is most remarkable with this engine, as it only requires 1.75 kilograms, or 3.85 lbs. (English) per hour, per effective horse power.

STEEL RAILS are still gaining in favor on first-class railroads. By the end of the present season the Chicago and Alton Railroad Company will have one-fourth of its road laid with steel, and it has contracted for enough to lay another quarter of the road by the end of the next season.

The Boston and Albany Railroad have also decided to substitute steel for iron rails upon the entire track of that road as fast as practicable. About 9,000 tons of steel rails have been purchased with this object in Europe, 4,000 tons of which will be delivered this year and 5,000 tons next year. They will be laid as fast as they are received.

NEW METHOD OF SECURING BOLTS.—Iron bolts in wooden structures are always attacked by rust, which diminishes their size and loosens their hold. A simple remedy is now discovered. Bolts are coated with a mixture of zinc filings and grease. The iron is thus galvanized and preserved from oxidation. It is a French invention.

A QUADRUPLE RAILROAD TRACK.—It is announced that the New York Central Railroad Company have decided to lay a new double track all the way between New York and Buffalo, making a quadruple track (of eight rails) between the two cities.

IRON SHIPS.—Some shipbuilders predict the failure of iron in ships, which will cause a revival in trade in wooden ships, and assert that iron vessels are always ready to sink when the heads of the iron rivets become corroded. That their decadence, when commenced, will be rapid.

Decay of Stone.

Dr. R. Angus Smith, of London, Eng., has observed that the particles of stone most liable to be in long contact with rain from town atmospheres, in England at least, were most subject to decay.

Believing the acid in the rain to be the cause, he supposed the endurance of a silicious stone might be measured by its resistance to acids. He proposed, therefore, to use stronger solutions, and thus to approach to the action of long periods of time. He tried a few specimens in this way, and with most promising results.

Pieces of stone of about one cubic inch in size were broken, by allowing a hammer to fall upon them, the number of blows required to produce fracture being counted. Similar pieces were steeped in dilute acid; both sulphuric and muriatic acid were tried, and the latter preferred. The number of blows now necessary was counted. Some sandstones gave way at once, and crumbled into powder, some resisted long. One very dense silicious stone was but little affected. It had stood on a bridge (in a country place, however) unaltered for centuries.

These trials are merely the beginnings of a very extensive set of experiments about to be undertaken by Dr. Angus Smith, with a view to establish a standard of comparison.

SCIENTIFIC PROGRESS.

The Evolution Theory.

In all that has been said in favor of the Darwinian doctrine of evolution it is claimed that no one has yet been bold enough to assail the position that "there is a distinction in kind between the mental faculties of man and those of the brute; and that in consequence of this distinction in kind, no gradual progress from the mental faculties of the one to those of the other can have taken place." James More, M. D., furnishes the *London Lancet* for July 27, 1872, with a paper upon this special point from which we condense as follows:

This specific distinction is nowhere more apparent than in the feelings and emotions. A very slight observation is sufficient to convince us that, though there is a close similarity, or even identity, in what may be called the physical or corporal feelings of man and the brute, still man stands alone in the possession of purely intellectual and moral emotions. It is in virtue of his animal or corporal organization that man possesses, like the brute, these grosser feelings; but it is in virtue of his self-consciousness that he possesses feelings and emotions which, in their expression, control the intelligence, guide the will and are in strict harmony with his religious nature.

We cannot but admit that the lower animals have feelings and emotions of a complex kind, which, besides entering largely into their mental life, produce much the same effect upon their bodily organization as the same feelings and emotions do on man. Terror acts in the same manner on them as on us, causing the muscles to tremble, the heart to palpitate, etc. They have suspicion, courage, fear, affection and other allied emotions; but on analyzing these feelings, we are bound to admit that they are, for the most part, of physical origin—in fact, that they are simply modes of instinctive consciousness.

When man is the subject of any kind of feeling he looks inwardly, into his own being, and not outwardly. Our emotions are purely subjective. On the other hand, the emotions of the lower animals are deficient in the subjective element. Like their higher instinctive and probably also their intellectual acts, their emotions are merely acts of objective consciousness. Their feelings are always related to some object, and can come into play only in the actual presence of that object. Their emotions have never any reference to any general notion or abstract idea, but merely to external objects of the senses.

This distinction—that of subjective in man and objective in the brute—our author holds to be a specific and important one, and places man in a position far above that of the brute—a position, which could not have been arrived at by the latter through millions of ages of evolutionism.

In the brute, the appetites, feelings, or emotions being under the influence and guidance of instinct, must be obeyed, and they are often obeyed contrary to the conditions under which they ought to be manifested. This is what is sometimes called blind instinct; it is simply the manifestation of any feeling or emotion apart from conscious intelligence.

An instance in point is given of a dog, which while enfeeling under the knife of his master, used for scientific purposes, licked the hand that gave him pain—thus showing a feeling of love apart from intelligence.

The brute is incapable of being actuated by mixed feelings or motives, one idea being always dominant and guiding their conduct.

In recapitulation our author finally says:—"We find that the feelings and emotions of man give him quite a distinctive character, and seem to exclude him from the scale of mere animal being."

1. The emotions in man are subjective, in the brute they are purely objective acts.

2. Man has intellectual, moral and corporal emotions, which may hold simple or complex relations, according as they are conditioned by consciousness or self-consciousness.

3. The brute has corporal emotions, which may hold simple or complex relations, according as they are conditioned by instinct or intelligence.

4. Man possesses emotions which have reference to his aesthetic or religious nature.

5. The feelings and the emotions of the brute, like the purely corporal emotions in man, have reference only to the preservation of the individual and continuation of the species.

6. The higher emotions of man hold very complex relations to the element of time, and place him in harmony with the past, present and future.

7. The emotions of the brute have reference only to the present.

8. The emotions of man are in strict harmony with his moral will. The emotions of the brute are in accord only with volition.

9. Certain emotions in man and animals become, under certain circumstances, dominant in the mind, conquering and replacing all other emotions and feelings.

10. Man can control or prevent his domination of feelings; the brute cannot.

11. The emotion or feeling of wonder is one of the most important in man, and, from its special relations to time and space, forms one of the most distinctive features in his mind. In the brute this feeling has no definite relation to time or space.

A Planet Between Mercury and the Sun.

It has for some time been suspected by astronomers that there was a small planet revolving about the sun, between that luminary and the orbit of Mercury, and with a period of revolution of about 20 days. This matter has been quite recently alluded to in *Nature*. In the *Scientific American* of Dec. 14th, Mr. J. R. Hind called especial attention to the subject and suggested that, on March 24th next, the sun's disk should be watched, as a conjunction of this hypothetical planet with the sun is expected to occur about 10 A. M. on that day.

In a subsequent number of the same paper, Mr. John H. Tice, an astronomer of St. Louis, Mo., writes as follows: In the latter half of September, 1859—I cannot now fix the exact date, though it may have been about the 20th—I saw the planet pass over the disk of the sun. I first saw it about 9 o'clock, my attention being called to it by some boys who were looking at the sun through a smoked glass. It was then on the eastern limb, and its apparent diameter was about 2½ inches. It took it about two hours to pass over the sun. As it is impossible for any of the known interior planets to pass over the sun in the month of September, it must have been an unknown planet. I communicated this fact to the naval professors in 1869, requesting that search be made for this interior planet at the eclipse of that year, but nothing was ascertained.

NEW THEORY OF CYCLONES.—An officer connected with the Spanish navy has published a new theory of cyclones, which is, at least, a very plausible one. He found his reasoning on the hypothesis that a zone of air, saturated with vapor and compressed by two opposite forces, requires a power of resistance peculiar to solid bodies, and may, therefore, be made to revolve like a disk. He applies this hypothesis to the typhoon of the Chinese Sea, and shows what is universally known, that there is a northeast trade wind and a southwest monsoon, and that between these two winds there exists in the Pacific a zone of calm which shifts its position in accordance with the prevailing wind—that is always on the side of the weaker one. Now, if these winds be oblique to each other and unequal, the zone will revolve, and, as it finds no obstacle to stop it, it will also be shifted more or less horizontally, which is the exact motion of cyclones.

SMOKING FLAMES.—M. Peaneth, says *Les Mondes*, has found that if a flame burning in the open air be approached to a vibratory tuning fork, the sound of the latter is considerably increased, as if it were placed in contact with the box of a stringed instrument. The sound acquires its greatest intensity when the flame is placed between the two branches of the fork. This phenomenon is believed to be analogous to the singing flame, only in such case it is the flame that excites the vibratory movement of the tube in order to place itself in similar synchronous vibrations; while, in the above mentioned instance, it is the fork that gives the tone and the flame takes up vibration in unison.

PLANT PHOSPHORESCENCE.—The Rev. M. J. Berkeley describes, in the *Gardener's Chronicle*, a very remarkable instance of luminosity in fungi. It occurred in the mycelium of an unknown species growing on a trunk of spruce or larch, and was as powerful as to make a perfect blaze of white light in the track where the trunk had been dragged, and vividly illuminating everything in contact with it. It gave almost light enough to read the time on the face of a watch, and continued for three days.

SCIENCE is studied by the observation of facts. But observation is not easy. It requires more memory and a further perspective than most men possess. Experiment, too, is necessary, which is a series of questions put to Nature, and no witness can be found more difficult to examine.

face. The mill is kept busy pounding out the gold while the water is plenty.

Idaho.—The Idaho is evidently getting ready to declare another dividend. A partial clean up—a sort of skimming of the amalgamators—after six days' run, gave \$18,000 worth of gold.

EUREKA.—Yesterday the amalgamators at the Eureka mill were cleaned up, after a 6 days' run with 10 stamps. The clean up does not include anything from the batteries. The result was about \$12,500 worth of gold. The rock now being put through the Eureka mill averages something like \$120 to the ton.

SAN BERNARDINO COUNTY.

NEW TIN MINE.—San Bernardino *Guardian*, Jan. 4: A new tin mine reported to be of wonderful richness was discovered about 3 months ago in a direction southeast of this place, distance about 12 miles. Experts pronounce it to be of the very best quality of tin ore, surpassing in richness any yet discovered in this county—and this is the only county in the State, we believe, that tin has yet been discovered in any great deposits. Messrs. Gass & Co. are the lucky discoverers of this mine, and for reasons, best known to themselves, we suppose, they have kept very reticent about this discovery, until recently. Mr. Harden Yager will take with him to San Francisco, in about two weeks, three or four hundred pounds of this ore for assay. We are anxious to see the returns from the assay, believing, from the representation made of its richness, that it will equal if not surpass our celebrated Temescal Tin Mine.

ORD DISTRICT.—During the past week ore brought in by Messrs. McCoy and Coburn from their lead in this district has been successfully smelted at Forney's blacksmith shop—the first successful attempt made here. In this case the pure metal—silver—was run out. The lead is unquestionably very rich.

AVA WATTS DISTRICT.—Mr. Sam Strong recently arrived from this district, bringing with him a ton of exceedingly rich ore which he confidently expects—from various tests—to yield \$3,000 per ton. Mr. S. has gone to Truckee for machinery which he has there, and intends at once, to forward to his mine. Mr. Horace Clark, also, has returned from Ivanpah laden with very rich ore—\$1,600.

SANTA CLARA COUNTY.

COAL.—Gilroy *Advocate*, Jan. 11: We learn that Henry Miller Esq., has discovered an extensive coal mine on his Los Animas grant, a few hundred yards south of the Pajaro bridge, and about 6 miles from this city. Mr. Jas. P. Sargent informs us that he burned some of the coal, and it is a superior article. Vast deposits are said to be imbedded in the range of hills that divide the Pajaro and San Benito rivers.

SIERRA COUNTY.

EMPIRE.—Downville *Messenger*, Jan. 11: This Co. are driving their tunnel as fast as 3 shifts can send it. This is a new unopened mine adjoining the Monumental, and no doubt is entertained of its being equal to any of the celebrated mines on the Blue Lead Range. The tunnel to open the mine is to be 2,900 ft., one-half of which is completed and the remainder being in soft rock; it is estimated that 10 months' time will be required to tap the channel.

MONUMENTAL.—This Co. is one of those established facts requiring no especial mention. The pay is uniform and the mine lasting. Each month brings its regular dividends. Some apparent new developments have recently been made in extending their main tunnel into the hill by finding pay dirt much farther back than any found by the adjoining claim.

HAWKEYE.—This Co. is one of those poor unfortunates which never draws a healthy breath—always sick and just dying—but never dies. This Co. has always had good dirt; but owing to a combination of circumstances, a large debt has accumulated and the mine is surrendered to the creditors to get their money if they can.

UNION.—This mine shows very cheering prospects. After running a long time to reach ground beyond and back of former workings, and the sudden flooding of the mine, requiring a long time and much expense to tap, the first new ground reached did not meet the expectations of one conversant with the mine, however, it soon was proved to be but a low depression or pot-hole, which as soon as passed, exposed as fine a body of gravel as is to be met with in any of the mines in that vicinity. The system of working the mine is very complete, and the cost of dirt in the dump is considerable less than in any mine yet worked in that vicinity. A crew of about 60 men are now employed and the force will soon be increased. Water is abundant for all purposes.

COMET.—This Co. in their sluicing mine have made a good year's run, and the showing is exceedingly good for a few years yet. They are now extending their tunnel to get their flume closer to the face, thereby enabling them to run dirt much faster than formerly.

GRAVEL MINES.—Grass Valley *Union*, Jan. 11: On the "Ridge" of Nevada county the miners are doing a land office business. At Forest City in Sierra county, the Bald Mountain Co. have had plenty of water for washing since the rain. For several successive days they took out about 140 ounces daily. The same thing is proportionally true of all the gold gravel claims in the country of gravel deposits. All of them are paying.

TUOLUMNE COUNTY.

SERENO GULCH.—Sonora *Independent*, Jan. 11: They have just cleaned up from a 2 weeks' run of 5 stamps, \$2,170. They are down 140 ft.

from the surface, and 35 ft. below the bottom tunnel where they are sinking and stopping in this level, and thus far into the hanging vein about 10 ft. The mine on the upper level shows a vein of 18 ft. The boys say that the gold is thick in the rock, and we have no doubt from present indications that it will turn out one of the finest mines in the State. They are at present running 10 stamps.

CITY MINING.—Loomard & Hart have commenced operations in view to mining the "Clark lot," purchased by them some time ago. They have dug a deep drain under the street gutter to drain off the water, which will also afford sufficient fall for sluices.

Nevada.

LANDER COUNTY.

COY HILL.—Eureka *Sentinel*, Jan. 8: The Paul Jones, who has been thoroughly prospected, than any other mine belonging to the Co., is now turning out some of the richest ore ever found in this district, or, in fact, in any portion of Eastern Nevada. Blasts were put in recently, throwing out large masses of ore, permeated with veins of crystallized horn silver, which were in some cases from one-sixteenth to one-eighth of an inch in thickness. From all indications, a large body of very rich ore is a subject of antiquity, with appearance of being a permanent vein. In order to obtain an average assay of the ore, a sample of the dust taken from a drill-hole was assayed, and yielded \$2,333 per ton in silver. An average specimen of rock from the vein of ore containing horn silver, went \$2,754 per ton. A large amount of second and third-class ore, varying in value from \$100 to \$1,000 per ton, is found in the mine, a quantity of which will be worked at the Phoenix Smelting Works within a few days.

DIAMOND DISTRICT.—Jan. 10: Some interests in loading mines have been lately transferred to parties who mean business; as the Bamboo Nos. 1 and 2, and Grant Mining Companies' claims. The extension on the Champion will also be prospected in the spring. The ore of Diamond district is a subject of antiquity, with a large proportion of galena. It assays very high in silver. The Banner mine belongs to a San Francisco company, who devote one-half of their stock to a fund for working capital. The mine is on the same hill with the Champion, Bamboo and Grant, and hears the same quality of ore.

SUNNY VALLEY DISTRICT.—Several series of mines in this locality having passed into the hands of the Lander Mill and Mining Company, a number of them are now being developed rapidly. Working results from the ore show a yield of \$150, \$200, and as high as \$3,000 in some instances. Much of the ore contains very little base metal. It must, however, be roasted previous to milling.

SECRET CANON DISTRICT.—Considerable prospecting is going on in this district, particularly in the Geddes & Bertrand and Hoscoe mines. The latter is in litigation, but the owners in possession still take out ore and have it smelted at the Phoenix works. The ore is a granulated sulphuret of lead, with some antimony. It is worked from the shafts, which have reached a deposit occupying the entire space. The deepest shaft is 50 ft. Yield of the ore by smelting from \$40 to \$150 in silver. The Hoscoe mine is a subject of antiquity, and the consequence of the suit with Eureka Co. The Lookout mine shows the largest body of ore ever discovered in the district. The Phoenix Co. have lately struck a good body of paying ore in one of their mines. The Excelsior mine, belonging to the Silver West Con. Co., will be tapped by a tunnel below their present works, and beneath the body of ore in sight. The Fourth-of-July Tunnel is nearly completed. The two latter mines are on Prospect Mountain. The Valentine and Byron, near by, belonging to the Ruby Con., are being rapidly developed. The Dandenberg, on Home Ticket Hill, belonging to the Ruby Con., is now worked from a deep shaft. The Home Ticket Co. are still actively engaged in developing their mine. The entire hill on which they are located is a network of mineral veins and deposits. The Ruby Hill Tunnel has reached a length of 308 ft., with indications of a near approach to ore. A new contract has recently been let on this tunnel, and the work is going on as briskly as possible.

The Lemon Tunnel is now in 480 ft., and the face is within 40 ft. of the ore deposit. The ore of the Lemon mine is of a higher grade, and very fine for milling. The Coy Hill mines have been rich, and are growing richer. The result of the latest assay of rock from the Paul Jones, taken from the depth of 25 ft. only, showed a yield of \$2,835.56 per ton. At and near this point the vein matter averages 1 1/2 ft. A specimen lies on our table, with a coating of horn silver as thick as a case-knife blade. Another piece we saw has a thick coating of soft horn silver that may be cut with the finger-nail, and melts in the flame of a candle like the candle itself. It is owned by only two persons, one of whom is G. W. Kinney, late of Mining Recorder.

ELY DISTRICT.

CHARTER OAK.—Pioche *Record*, Jan. 5: Sinking the shaft to the depth of 100 ft., running a drift from that point and now sinking a winze on the ledge. Fine ore is being taken out every day.

GREY EAGLE AND SETTING SUN CON.—Working constantly, and have attained a depth of 125 ft. The work has all been concentrated on the Grey Eagle. Some 20 odd tons of ore lie on the dump, which assays from \$200 to \$300 per ton. The Setting Sun has a shaft sunk 75 ft., and looks well.

POOHE.—Still drifting from the bottom of the shaft. As yet not much has been struck, but it is expected to present itself every day. Four tons of ore are being hoisted daily from other portions of the mine, which produces rich results. The Magnet Mill is kept steadily at work on the ores of this mine.

PORTLAND.—The work is being vigorously pushed; 60 tons of first-class is now on the dump; some of the same class was milled and pulped \$200 to the ton. The shaft is 100 ft. in depth. A winze from this level has reached a depth of 45 ft. The ledge shows well, being of a rich decomposed yellow chloride. The ledge in this winze is 2 to 3 1/2 ft. in width. There is about \$25,000 in the treasury at present.

EXCELSIOR.—Drifting is now being done to connect the winzes. The ore shows in this drift as far as worked, and is very rich. On the Excelsior dump 275 tons of rich ore awaits crushing. The quantity and quality of the ore is amazing.

MEADOW VALLEY.—No. 3 of this mine has a depth of 620 ft. at the 7th level. Sinking at this point and taking out ore. No. 5 is 430 ft. deep. No. 7 is 750 ft. deep and still sinking. The bulk of the ore comes from No. 3 and some from No. 7.

RAYMOND & ELY.—Depth of the Lighter shaft to the 7th level, 623 ft. vertical depth. The 7th level is just being opened, and a fine ledge is showing splendidly. Twelve hundred tons of 3d-class ore lies on dump and about 1,000 tons of good ore at the mill.

SILVER PEAK.—Running drift west from the bottom of the incline. Taking out a little ore all the time.

GREY AND BISHOP.—The depth of this mine is about 250 ft. The vein has been in sight the entire depths, and specks of ore of a very rich character can be seen throughout.

WASHINGTON COBLE.—The incline has attained a depth of 600 ft. The prospects look flattering.

MAZEPPA.—Jan. 8: An important strike has been made in this mine. At the depth of 160 ft. in a drift connecting the new works with the old shaft the ledge has been struck, and stopping has been commenced. The ore body varies in thickness from 20 to 30 inches and is of the first quality, assaying from \$200 to \$3,000 per ton.

HUMBOLDT.

BOLIVIA DISTRICT.—Unionville *Silver State*, Jan. 11: It is reported that an English Co. is negotiating for the purchase of the Baker copper mine. The mine is developed by a shaft 75 ft. in depth, and the ore carries a high percentage of copper.

CENTRAL DISTRICT.—Mullen & Co.'s mill is running steadily on samples of ore from different ledges in the district. A lot of crude bullion from the mill, the result of a few days' run on Boulder ore, was melted and assayed this week. The bar weighed 70 ounces, the assayed value of which was \$465, practically gold.

GOLD RUN DISTRICT.—A rich strike in the Manette mine is reported. Goldendans claim that the ore is richer in silver than any ever found in quantity in the State.

MILLS RUNNING.—The Pioneer mill is running on ore from the Humber and the Arizona and Silver mill on ore from the Arizona. The Arizona is producing more ore in proportion to the number of miners employed than at any time during the summer.

BUTTE MILL.—We learn that this Butte mill at Ite Patch, which has been shut down for 2 or 3 weeks, started up again last Monday.

LAST CHANCE.—After a long search the owners of this mine have succeeded in finding the main ledge, which is 3 ft. wide and contains exceedingly rich ore. The ore, extracted from spurs and stringers encountered in searching for the ledge has been sufficient to pay all expenses incurred. Several lots of ore shipped, yielded from \$200 to \$300 per ton.

TALLAH.—W. T. Burns and L. B. Brackett have leased the Tallah, in Dun Glen, for 6 months. We understand they intend to commence work on the mine next week.

DE SOTO.—Nine and a half tons of first-class shipping ore was shipped from the De Soto mine to San Francisco this week.

REESA RIVER.

BULLION.—Reesa River *Reveille*, Jan. 6: The bullion shipped by the Manhattan Co. for 1872 consisted of 670 bars, weighing 66,300 lbs. of the value of \$895,847.35. This the product of the 'ore from the Reesa River District mines, and may be taken as a fair result of one 20 stamp mill only.

OREGON.—Jan. 11: The ore house is full of good ore. ISABELLA.—This mine is leased to 4 companies, taking out good ore.

SARATOGA.—This mine is always doing well, and taking out the very best kind of ore; the ore house contains 50 tons of \$400 ore.

GROVE'S TUNNEL.—Turning out large quantities of good ore, milled, results reserved.

FREEHOLD.—Some \$100 ore is being taken from the upper level. The ledge is large.

S. O. BAKER.—Taking out good ore.

MORGAN & MUNCEY.—The ledge has been struck, and good ore found.

YANKEE BLADE.—Maggie.—Some rich sulphuret ore has been milled, results reserved.

KLING & KELLEY.—Taking out large quantities of ore.

HARTFELD TUNNEL.—Prospects are very flattering, and somewhat ore is being extracted; there are probably ten tons now in the ore house of good grade.

BELMONT CO.—The Canfield mine has an incline down 264 ft. The first level is 75 ft. down. The level is open and 30 ft. north, and shows some of the best bodies of good ore, which are held in reserve. A 4 ft. further down is the second level—at the water line; it is opened 210 ft. southerly and 616 ft. northerly. It was a fine sight to look at the fine breast of chlorides along the level nearly the entire length from the incline northward. The lower level is now run southerly 135 ft., and northerly 220 ft. Several patches of very good ore are exposed in each of these drifts.

WASHOE.

MILLS ON THE CARSON RIVER.—Gold Hill *News*, Jan. 10: We have this last 3 days, says the *Enterprise*, nearly 40,000 lbs. of ties and as much as 150 ft. level. The Savage, Vivian, Mexican and Brunswick mills, on the Carson River, and work is being executed in a lively manner. The Eureka Mill crushes from 20 to 22 car-loads of Belcher ore per day, 7 1/2 tons being the average weight of the car-loads. The Santiago Mill, running on Belcher ore, also, manages to crush 10 car-loads per day, and nearly all the other mills are in active operation.

BELCHER.—Jan. 11: Daily yield 330 tons, from the 1000 and 1100-ft. levels. The incline is still sinking at a good rate of progress, and is 33 ft. below the 1200-ft. level. The drift from this station north is in 42 ft., and the main drift south at the 1200-ft. level to meet it is in 250 ft. from the Crown Point line; the face is splendid ore. The south drift to connect the 1100 and 1200-ft. levels, 200 ft. south of the Crown Point line, is probably about completed, as the connection between the winzes and raise was expected to be made this afternoon. The main drift east from this incline, at the 1100-ft. level, is in 286 ft., and the north drift at the 850-ft. level is in 393 ft. A neat little engine of 8 or 10 horse-power has arrived and will be put to work to connect the 1100 and 1200-ft. levels, at the head of the south winze spoken of at the 1100-ft. level. It is to be worked by compressed air.

SIERRA NEVADA.—Daily yield, 45 tons of good milling ore. The different ore breasts are looking and yielding well, as usual. The mill and hoisting works are receiving the addition of two new tubular hoilers, 50 inches in diameter and 16 ft. long; also new car-roads and other machinery.

SAVAGE.—Daily yield 140 tons of ore, worth \$28 per ton. The incline is making excellent progress, the rock in the bottom working much softer than at our last report; it is down 135 ft. below the 1000-ft. level. The main shaft drift on the 1000-ft. level is pushed steadily ahead. The drift on the 1100-ft. level, in which assays are obtained as high as \$17 per ton, 700 much water at the 1500 ft. level to allow of proceeding at present.

OVERMAN.—The water in the shaft has been at last drained, after 16 days' incessant application, during which time 40,000 gallons per hour was hoisted from the shaft, making the total amount of 15,360,000 gallons. The shaft has been resumed in the main drift, it being found necessary to clean it out and retimber it in places where the ground was soft.

CROWN POINT.—The ore breasts all look well as usual; both ore and bullion yield highly satisfactory. The main incline is down 161 ft. below the 1300-ft. level, and good progress is being made. The 1300-ft. level is working better than ever, and the cross-cut east from the east winze, shows low grade ore in the face, with no sign of the east wall as yet. The assays from this level average over \$150 to the ton.

YELLOW JACKET.—Nothing new in the drift or cross-cutting at the 1300-ft. level north. The 1400-ft. level drift east into the ledge about 63 ft. It has developed a fine body of quartz drift ore, in which assays are obtained as high as \$17 per ton. 700 much water at the 1500 ft. level to allow of proceeding at present.

CHOLLAR POTOL.—Daily yield 110 tons, the assay of which is \$38 per ton. The prospecting drift at the first station has made connection with the old Potol shaft. The north drift at the 3d station is in 100 ft.

ISLAND.—The incline is down 97 ft. below the old tunnel level, making a depth reached of about 350 ft. from the surface. The upper side of the shaft is still in \$20 to \$25 ore, while the under side is, cutting the east wall. The ledge at this depth pitches strongly to the west.

CON. VIRGINIA.—Sinking the shaft is making progress. The main north drift on the 1,500-ft. level, from the Gould & Curry shaft is pushed ahead, the rock in the face being much softer.

GOULD & CURRY.—The incline is down 110 ft. below the 1,600-ft. level. The main south drift on the 1,600-ft. level is pushed ahead to connect with the north drift on the same level from the Savage.

HALL & NORCROSS.—The north winze on the 1,500-ft. level to connect with the 1,500 is down 146 ft.

MINZ.—December 28th an assay of the ore gave \$88.89 in gold, and \$271.50 in silver; January 4th, \$140.57 in gold and \$378.90 in silver, showing a decided increase in the value.

IMPERIAL EMPIRE.—The surface work for the new pumping machinery is completed.

SILVER HILL.—Both the north and south drifts at the first station are still driven.

RED JACKET.—Machinery and pump being put in position for an active resumption of work in the mine. The incline is now 75 ft. deep, and shows a fine 6 ft. ledge.

JULIA.—Sinking the shaft is making good progress. The drift on the 700-ft. level is in 42 ft. Prospects favorable at all points of the mine.

BUCKEYE.—The new ore body developed south of the incline is turning out finely and both mills kept steadily running.

KENTUCK.—Still yielding the usual quantity of good ore from the old workings about the 500 and 600-ft. levels.

TAH.—All work in the mine suspended for the present on account of inability to obtain wood and timbers.

KNECHTERBROCK.—Main west drift in 437 ft.; face in clay, with some water, indicating ledge near by.

BEICHER.—Virginia *Chronicle*, Jan. 9: The Bank of California received today several bars of bullion from the Belcher mine, amounting in the aggregate to \$38,000. Added to the amount received yesterday from the same source, makes \$30,000 received in two days from this mine.

EUREKA MILL.—Virginia *Enterprise*, Jan. 7: During the month of December the Eureka mill turned out from Belcher ore 5,000 tons of bullion. The average value is \$30 per ton, making a total of \$300,000, or nearly enough to pay the dividend recently declared by the Belcher Mining Company.

Colorado.

GRAND ISLAND DISTRICT.

CARBON.—Central City *Register*, Jan. 8: The west half gives employment to 60 men. The east half employs 30 men, and is producing an average of 25 tons of ore per day.

SHERMAN.—The main shaft is 40 ft. deep and still going down. The main level 40 ft. in length, is being stopped. The first-class ore yields from \$300 to \$600 per ton, the second from \$100 to \$250; and the third is sold to Fred & Carter for \$50 per ton. A recent estimate shows the mine to be paying at the rate of \$150 per week for every man employed.

SEVEN-THIRTY.—The main shaft is 75 ft. deep, from which a level is being driven eastward. It is now 130 ft. in length; 35 tons of rich ore are piled up on the surface, of which the first-class nets \$1,000 per ton, the second 350 ounces.

EXTENSION.—This ledge has a shaft 50 ft. deep, and ore worth 530 ounces silver per ton.

ONTARIO.—Has obtained the depth of 90 ft., and is sending out ore which yields seven hundred ounces of silver per ton.

HAWASSA.—It is a late and very rich discovery, located something like half a mile north-east of Cardinal. At the depth of 20 ft., 30 inches of solid mineral is exposed. The *Enterprise*, Jan. 6: This silver mine at Phillipsburg has been sold to a Pennsylvania Co. for \$500,000. This mine has been harassed by long and complicated litigation. The title has been settled at last, and extensive operations are to be commenced at once.

Idaho.

CHALLENGE.—Owyhee *Avantader*, Jan. 4: This new mine begins where the original Mahogany, consisting of 800 ft. in length, ends on the south.

MAHOGANY.—The 6th level drift in this mine is now in 240 ft. south of the shaft, showing a rich vein over 18 ft. wide. The winze for the 7th level is down 75 ft., and the sinking 25 ft. more, this level will be started south in which direction the rich ore has been shown from the surface downward. In the bottom of this 7th level winze the ledge is 3 ft. 4 inches wide and exceedingly rich. The main shaft is now down 70 ft. for the 7th level, in fine looking ore. The Cosmos Mill is steadily running on Mahogany ore and turning out plenty of bullion.

BULLION.—W. F. & Co. shipped from here during the 2 weeks ending yesterday, 20 bars of bullion, valued at \$35,833.46.

SOUTH CHARLOT MILL.—We are informed that this mill will be started up next week and run steadily on South Charlot and Red Jacket ore.

Montana.

CLAUDEVILLE DISTRICT.—Montanian, Jan. 2: The mines of this district are being worked with great energy and success. The Legal Tender has been developed to a considerable extent, establishing beyond a question its permanence and value. It has been found that the Legal Tender for \$400,000. There are several other lodes in the vicinity believed to be quite as good as the Legal Tender, which are being developed as rapidly as possible. This camp alone could produce a thousand tons of ore for shipment per day that would pay large returns; if railroad construction were open south.

PARK CITY.—Helen *Herald*, Dec. 26: At the Park the ground is literally honey-combed by industrious prospectors. A shaft 100 ft. deep has just been completed on the Choctaw ledge, and steam hoisting works have been erected.

Oregon.

QUARTZ MINES.—Oregonian, Jan. 4: At the assay office of J. H. Fish, we were shown recently specimens of quartz rock recently taken from the Summit Lode Mine, at the foot of Mt. Hood, in the Cascade Range, near the Eastern Oregon, Union county, and are owned principally by J. H. Packwood. The lode has been definitely prospected for a distance of 1,000 ft., and this mine is now ready for active operations. A shaft has been sunk a distance of 150 ft., and large quantities of rock have been taken out. About \$25,000 has been realized so far from these mines. The rock is quite rich in gold, and will average \$30 per ton. Mr. Packwood proposes to go to California soon and incorporate a company for the purpose of working these mines, and also to place the stock on the market.

Utah.

STAR DISTRICT.—Utah *Mining Journal*, Jan. 8: The late sale of the Old Hickory made things lively in the camp; everybody is at work. This Hattie is still working out of the old shaft, and the ledge has been struck in a new place, being a vein of rich, hard ore, about 2 ft. wide, that will work \$300 to the ton.

It is announced that a rich strike has been made in the Wellington, and that a large amount of ore is already on the dump. Last night 1,500 shares were telegraphed for by different parties here to the San Francisco Board; \$20,000 has been offered for the ore on the dump, and it will be brought to the city as soon as the roads are in condition. The strike is the richest that has yet been made.

We are reliably informed that pure chloride for horn silver was struck yesterday in one of Winsor Co.'s mines, Little Cottonwood. We did not learn the extent of the strike, only that a large body had been encountered.

CORRECTION.—In our list of mining, incinerations, in the issue of the MINING AND SCIENTIFIC PRESS of the 4th inst., we gave that of the "Mountain Co." It should have been as follows:

MONTEUR M. AND M. CO.—Dec. 31. Location: California, Nevada, Oregon and elsewhere. Trustees—W. A. Darling, J. C. Boyd, J. Brodie, T. P. Reynolds and E. W. Hause.

Resources of Utah.

We continue the articles under this head from the Salt Lake Tribune.

The Germania Separating and Refining Works.

The object of these works is to separate from the impure lead bullion the precious metals which it contains, as well as its impurities, and to effect this on the spot where the bullion is produced, and thus save the expense of shipping worthless matter at great cost to points far distant.

The works are situated on the west side of the U. S. R. R., about eight miles from Salt Lake City, and were commenced nearly six months ago, and although not yet completed, are now in operation and producing about forty tons of desilverized or marketable lead daily.

The Buildings

Are extensive, substantial, and arranged with a view to economy of labor and convenience in manipulation. They consist of the main building, or furnace house, refining house, assay office, engine house and all necessary offices and out-houses, together with manager's and superintendent's dwellings. In the furnace building are five large cast-iron pots, set in substantial brick work, each one over its furnace or fire place, two reverberatory softening furnaces, two calciners, and two flowing furnaces. Connected with this building is the engine house, containing a fine forty-five horse power engine, and a fifty-five horse power boiler. A little to the north of this is an inclined shaft furnace, while to the west of the works, at a distance of a few rods is a substantial brick stack, which is connected with the furnaces by means of underground flues of strong masonry. A side track is laid from the main track to the works, by means of which all the materials employed are brought to their respective destinations without trans-shipment.

The process which is here used for separating the lead and silver is that known as

Flach's Process,

With some additions and improvements made by Mr. Sieger, the superintendent of the establishment.

The following description will give some idea of the

Modus Operandi.

About 23 or 23½ tons of base bullion, as received from the different smelting works are put into one of the largest of the pots, which are five in number, two of them having a capacity of 25 tons each, the other three being smaller; the whole number being set in the form of a wedge, the two largest forming the broad part, while the smallest pot forms the point. A sharp heat is kept up until the impure lead is thoroughly melted, and sufficiently hot to melt the zinc (which is the medium of separation) immediately on its addition, or at a temperature of about 411 degs. Celsius, the melting point of zinc. Zinc is employed for the separation of gold, silver and copper from lead, owing to its possessing a greater chemical affinity for these metals than that of lead. The zinc employed at this establishment is of two kinds, viz., commercial or good zinc, and dross zinc (a refuse matter from galvanic batteries) which contains about 30 per cent. of iron. The former is obtained from Illinois at a cost of 9 cents per pound, and the latter from New York at a cost of 5 cents per pound. When the base bullion is tolerably free from impurities and contains from 150 to 200 oz. of silver per ton, 2¼ to 2½ per cent. of zinc, or 3 to 3½ per cent. of dross zinc suffices for its complete desilverization.

As soon as the metal has attained the requisite heat, from ¾ to 1 per cent. of zinc, or from ½ to 1½ per cent. of zinc dross is added to the molten mass, which is well stirred by two men for half an hour, and then allowed to remain still for three hours. Immediately after stirring, the fire is withdrawn from under the pot, and the metal allowed to cool to a dull red heat. The zinc being thoroughly mixed with the lead; takes up the gold and copper, with the greater portion of the silver, and rises to the surface, forming a scum or cake which gradually covers the whole of the lead.

The object of adding a portion and not the whole of the zinc at one time, is to avoid the caking of the zinc on the surface of the metallic bath, whereby it would not be in a state of division sufficiently fine to mix thoroughly with the lead.

At the expiration of three hours this scum is skimmed off and transferred to the pot next in advance. The whole operation, from the commencement to this point, occupies about four hours, but varies with the amount of the impurities in the lead. A second addition of zinc is now made in the proportion of ¾ to ¾ per cent. of zinc, or 1 to 1½ per cent. of zinc dross.

The dross or scum in the second or advanced pot, after being melted, stirred, and allowed to cool, is skimmed and the skimmings transferred to the 3d, or end pot of the series, the alloyed lead and zinc containing a little silver which has separated from the dross being moved back to No. 1. This is effected by means of an iron gutter leading from the rim of one pot to that of the other, into which the lead is ladled. A similar process is then performed with pot No. 3. The dross being skimmed off and transferred to a receptacle called the "safe," and the separated alloy of lead and zinc carried back. The remainder of the zinc having been added to pot No. 1, it is again stirred and skimmed, the skimmings being put aside for a further operation.

This lead running in pot No. 1. is now prac-

tically free from gold, silver and copper, but is rendered a little hard by a portion of the zinc remaining in it, together with a little antimony, of which, if there is much in the base bullion, a small percentage remains.

At the bottom of the large pot is a pipe connected with an iron gutter leading to the hearth of a reverberatory softening furnace, which is placed at a lower level than that of the pots, to avoid the necessity of moving the lead by hand.

These furnaces, of which there is two, one for each large pot, are 15 feet 6 inches long and 9 feet 4 inches wide, internal dimensions, with a hearth or bed of sufficient depth to contain the contents of the large pot. The bed of this furnace is composed of a large iron pan cast in three pieces and having the bottom flat and gradually curving to meet the upright sides and ends. This is covered with fire clay, and over the clay with fire brick set on end. When well put together these parts will last for years. The furnaces has only one fire grate, placed at the end. These furnaces are built upon arches, which serve to keep the bottom cool, in order to more easily remove any lead which through bad setting may trickle through. The furnace having been raised to the requisite temperature, the lead pot is tapped and the metal allowed to flow into the furnace. The heat is then kept up and a portion of the zinc and antimony is oxidized and escapes in the form of fume, while the remainder forms a scum which rises to the surface and covers the bath of lead. The lead is well rabbled from time to time with iron rakes, in order to expose a fresh surface to the air, and this is continued until the lead shows, by samples taken from the furnace, that it is pure and ready for tapping.

At a distance of a few feet from the end of the furnace is another pot, called the market pot, the level of its rim being a little below that of the hearth of the furnace, and into this the lead, after being skimmed, is allowed to flow through an iron gutter.

The moulds, which are on wheels, having been run under this pot, the lead is admitted into them by means of a tap which stops the supply as each mold is filled.

These bars of lead are made to weigh about one hundred and forty pounds each; and, when cool, are taken out and ready for shipment. They are now wheeled up an incline, but it is intended to have a raised tramway over the tapping place, on to which small wagons containing the bars are to be hoisted, and run direct to the side track. This lead is now pure, containing, on an average, not more than half a pwt. of silver to the ton, and being free from gold, copper and all impurities, and is fit for any of the purposes for which lead is applied, either for making white or red lead, sheet or pipe.

The loss in this furnace is very trifling, not amounting to more than one-half per cent. because the molten lead is almost continually covered with a crust of zinc, etc.

The whole operation, from the loading of the first pot to the tapping of the market lead, occupies twenty-four hours, and at the present time the capacity of these works is

40 Tons per Day.

So that each twenty-four hours, about 90 per cent. of the bullion operated upon is returned as pure marketable lead.

The dross obtained from the last skimming of No. 1 pot is transferred to a flat-bedded calcining or roasting furnace, of which there are two in the main building, one for treating the pot skimmings, the other for the skimmings from the reverberatory furnace. It is here thoroughly roasted at a temperature insufficient to soften it, so as to get rid of any remaining zinc or antimony, and when sufficiently roasted is then put in the flowing furnace, where the lead is separated from the iron and other matters which form a slag which is worthless. The lead is tapped and returned to No. 1 pot, with a fresh charge of bullion, when the same routine is again gone through. The flowing furnace is very similar to the reverberatory softening furnace, differing only in the form and material of the furnace bed. The calciners, before mentioned, have each two grates, with a flue rising from the center of the furnace. The object of the two grates is to obtain a much higher degree of heat when necessary for the refractory or very impure skimmings.

The same process is gone through with the skimmings from the softening furnace. The next point is the treatment of the rich alloy from pot No. 3, which was placed in the "safe." This is taken to the shaft furnace before mentioned, and which will be now described.

Description of Shaft Furnaces.

It is an inclined shaft furnace with the back sloping towards the front, at a little distance above the tuyeres the front recedes more abruptly from the back. The internal dimensions are, from breast to back two feet seven inches, and from side to side two feet six inches. It has three tuyeres having a diameter of only 1½ inches, and a pressure of blast equal to about 24 inches of water, or one pound upon the square inch. This blast is produced by a blowing cylinder, 24 inches in diameter, and having a 24-inch stroke. The blast passes into a chest or reservoir, and is thence conducted by pipes to the furnace.

The fuel used is coke (that in all the other furnaces, with the exception of the crucible furnace, being Vandyke coal) which is obtained from Pittsburg, and costs, delivered at the works about \$28 per ton.

The Fluxes

Used are Hematite iron ore, which is obtained from Rawlins, and costs about \$15 per ton, delivered, and a little lead-slag, of which plenty can be had in the neighborhood; the charge is composed as follows: Rich alloy, 250 lbs.; iron ore, 180 lbs.; Coke, 55 lbs.; and a little lead-slag. After a good heat has been raised in the furnace, the charging is commenced; the coke is first thrown in and spread evenly over the surface. The rich alloy is then charged, being all fed against the front of the furnace, the iron-ore and lead-slag are then thrown in and mixed together, and spread evenly over the furnace, three of these charges are worked in one hour, so that about sixteen thousand pounds of alloy are passed through this furnace in twenty-four hours. The heat is maintained so low that the furnace at the feed-door is perfectly black and quite cool; the only flame visible being a small reducing flame running up the inside of the front of the furnace. Owing to the peculiar construction of the furnace, the charge gradually sinks and meets the sudden incline, from whence the alloy passes down to the zone of fusion, in the center of the furnace, without touching the walls, and is not melted until when within a few inches of the tuyeres. By this process the copper is obtained by matte, and the gold, silver and lead in the form of a highly-enriched lead. This rich alloy is tapped off about once in every hour and a quarter, and the slag about every five minutes. This slag is received in cast-iron pots, where it is allowed to solidify before being turned out. This slag is almost entirely free from lead, and contains only a trace of silver, so that practically it may be considered clean. The bars of silver are now taken to the cupelling furnace. This is in appearance not unlike a very short reverberatory furnace with a very large grate; but instead of the usual bed are a couple of bars, on which is supported the cupel, or, as it is usually called, the "test."

The Test

Consists of an elliptical frame of wrought iron, filled in with bone-ash well beaten and hollowed out in the requisite shape by means of special tools for that purpose. At the back of the furnace are two holes, one where the blast pipe enters, and the other for introducing the rich bars into the test. The test, which is placed with its long axis towards the blast, is left a little thicker at the opposite end, where the litharge flows over. When the test has been raised to a good heat, a sufficient quantity of the rich lead is introduced, and the whole speedily melts, and the blast is now turned on. The oxygen of the air composing the blast, oxidizes the lead into litharge, and this takes up all foreign metals. A portion of the litharge is absorbed by the test, but much the larger quantity flows over the end of the test furthest from the blast, and is received in iron pots mounted on wheels, which are moved as fast as filled. The rich lead is continually added, until all has been oxidized, and the silver is now pure, containing only the gold in the bullion. If, however, there should happen to have been more copper in the enriched alloy than could be carried off by the lead contained in it (which is shown by the appearance of greenish spots floating on the silver), this can be easily removed by the addition of a little more pure lead to the test.

Immediately on the termination of the cupellation, a very beautiful phenomenon is seen, which is termed the "brightening." Just as the last trace of lead clears from the silver a peculiarly bright and vivid flash seems to cover the whole bath of metallic silver, and for an instant every brick in the arch of the furnace is reflected as plainly as in a mirror.

A series of ingot moulds set in a frame are then run under the test, and a hole bored into the bottom of the test, through which all the silver runs into the moulds.

These ingots are now taken to the crucible-house, and about thirty-five pounds weight put into a plumbago crucible and melted. A little charcoal is thrown into the crucible, and the whole stirred with a stick. After skimming off the coal and any little slag which may have formed, the metal is poured into ingot moulds of the requisite size, and the silver, which is now fine, is after assay stamped with its degree of fineness.

This finishes the whole operation, as the gold and silver are not separated at these works, but sold as an alloy.

Owing to the fact that all these operations are not proceeding at one and the same time, the number of men employed is comparatively small (being only thirty-five), when the large amount of work done comes to be considered.

Cost of the Works, Etc.

These works have been erected, not only with a view to convenience, but also to economy, the whole establishment, together with the purchase of the land (twenty-five acres), having cost not more than fifty-eight thousand dollars. It may be remarked here, that the total loss of lead in all these operations does not amount to more than 2½ per cent.

Ore Sampling Works.

These works were brought into existence from a want of some means of equitable arrangement between the seller and buyer of ores; as no two samples made by different interests would agree, with any accuracy, thereby causing mutual distrust and delay, each believing his own sample to be the correct one.

The first public sampling place was started by Geo. I. Johnson, Esq., of Boston, in the California corral, on Second South street, Salt Lake City, where the sampling was performed by

hand, no machinery being at that time erected. Ore, in lots of five tons and upwards, was brought to the corral and sampled, purchase or refusal being at the option of the sampler.

Howland's Mill.

These were the first complete sampling works erected in the Territory, and are situated at the corner of the block due south of the U. C. R. R. Depot, and contain an engine of twenty horse power, which communicates motion to a "Howland Crusher and a Burr stone mill." The whole of the machinery, together with a spacious sampling floor and private office being under one roof. This mill was erected by Messrs. S. W. Howland & Co., of San Francisco, in the winter of 1870, and was by them sold about the fall of 1871, to W. T. Richmond, Esq., of Chicago, who is the present owner. During the last summer it was leased by R. Macintosh, Esq., of this city, who now carries on the business.

Salt Lake City Sampling Mill.

This mill is situated on the west side of the U. S. Railroad track at the corner of 4th South and 3d West streets, and was built in June, 1871, by Geo. J. Johnson, Esq., who formed a business partnership with Messrs. James Lewis & Son of Liverpool, the firm assuming the name of Lewis, Johnson & Co. The machinery consists of a fifteen horse power high pressure engine by J. O. Hoadley of Boston, a Brodie crusher and a French burr-stone mill. The building, which is under one roof, consists of a spacious sampling floor 60x40 feet, an engine room, private office, assay office and laboratory. Since last summer the business has been carried on by Mr. Johnson alone. This mill has a sidetrack from the U. S. R. R., and spacious platforms for the reception of ores.

H. S. Jacobs & Co.'s Sampling Works,

Are situated one block north of the above, and on the eastern side of the railroad, with a side track for loading and unloading ores. The machinery consists of a very finely finished stationary engine and a Dodge crusher. The sampling floor, engine room and office are in one and the same building. These works were erected in June, 1871, by H. S. Jacobs & Co., of Pennsylvania, and during the early part of last summer passed into the hands of Messrs. Baxter & Co., who converted them into amalgamation works, having erected two pans with the usual attendant machinery.

At Sandy Station,

Messrs. Gordon and Murray and Messrs. Durant & Cutting connect with their forwarding business the sampling of ores and bullion.

Method of Sampling.

In sampling rich milling ores the whole bulk is usually crushed; but with poor milling ores, galena and copper ores, one-fifth of the bulk is generally operated upon. The ore, after having been crushed, is thoroughly mixed and spread out evenly on the sampling floor. It is then by a succession of what is termed "quarterings," reduced to a bulk of about two bushels. This is further pulverized by hand with "buckers" on an iron plate, until it will all pass through a one-eighth inch sieve. This is again thoroughly mixed and reduced by repeated quarterings to about the quantity of sample required by the buyers and sellers; say sufficient to fill four 4-ounce sample bottles.

The pulverized ore is now reduced either in a mortar or by "bucking" irons, to a state of division fine enough to enable it to pass through a sieve containing from fifty to sixty meshes to a linear inch. The sample is again thoroughly mixed and put into the bottles, which are sealed and labeled with the number of sacks, weight of ore, date of sampling and of sale. Owing to the great difficulty experienced in perfectly cleaning the burr-stone mills, they had to be abandoned, as it was found almost impossible to remove the whole of the previous sample, the fine particles of which lodged in the joints, etc., of the machine, thereby being liable to cause serious error, by portions of a previously crushed rich sample becoming mixed with a succeeding poor one, and vice versa.

COMB MANUFACTURE.—An English journal states that the greatest comb manufactory in the world is in Aberdeen, Scotland. There are thirty-six furnaces for preparing horns and tortoise-shell for combs, and no less than one hundred and twenty iron screw presses are continually going in stamping them. Steam-power is employed to cut the combs. The coarse combs are stamped or cut out, two being cut in one piece at a time. The fine dressing combs are cut by fine saws, some as fine as to cut forty teeth in the space of one inch, and revolving five thousand times in the space of one minute. There are some two thousand varieties of combs made, and the aggregate number produced, of all these different kinds, is 8,000,000 annually—a quantity that if laid together lengthwise would extend about seven hundred miles. The annual consumption of ox-horns is about 730,000, and the annual consumption of hoofs amounts to 4,000; the consumption of tortoise-shell and buffalo-horn, although not so large, is correspondingly valuable. A hoof undergoes eleven distinct operations before it becomes a finished comb.

PREMIUMS FOR DEVELOPMENT.—The Virginia Enterprise makes the suggestion to the Legislature of Nevada, to offer a bonus of \$10,000 to the man or company that produces the first one hundred tons of coal, and the same amount for the first one hundred flasks of quicksilver produced in Nevada; which, it says, is meeting with general approval by the press and people of that State.

USEFUL INFORMATION.

Luck.

It is the shallow who believe in luck; who say of a successful man, "he always was lucky," or of an unsuccessful one, "Poor fellow, just his luck." A man's luck is generally the measure of his capacity and perseverance. Chance produces effect, the world over. Water does not run up hill, nor do we gather, even in these days of progress, grapes of thorns, or figs of thistles. If we would gather golden grain, we must first sow the seed. If we would be wise we must work for wisdom. Riches, goodness, fame, love—each has its price and can be purchased for no loss. Life is a perpetual auction, where all prizes are knocked down to the highest bidder. The world's great men have been those who have toiled early and late. Even genius can find no royal road to its goal. Goethe, and Milton, and Newton, labored as the easy-going, fine gentlemen of literature cannot conceive. If they were great, they achieved greatness—it was not thrust upon them. Luck is ever waiting for something to turn up. Labor, with keen eyes and strong will, will turn up something. Luck lies in bed, and wishes the postman would bring him news of a legacy; labor turns out at six o'clock, and with a hussy pen or ringing hammer, lays the foundation of a competency. Luck whines; labor whistles. Luck relies on chances; labor, on character. Luck slips down to indigence; labor strikes upward for independence.—N. Y. Evening Telegram.

FORCE OF WIND.—It is seldom that a more striking instance of the great force which may be exerted by wind, is witnessed than was observed in the recent hurricane, which swept over the island of Sicily. It is said that no earthquake ever caused so much destruction. There are houses ruined, houses fallen on the ground, walls cleft from end to end, walls hanging outward as if to rest on the adjoining houses; there are roofs wholly swept away, sunken vaults, balconies torn from their places. Not a single house remains in which the whole roof and windows do not require thorough repairs. The streets are a mass of fragments and rubbish.

The iron bars of a balcony are to be seen curled up one way, those of another twisted up another way. There is a pillar of a palace which has been moved forward one foot without breaking, and stands up isolated all in one piece. There is a wall of another palace which has fallen back more than three feet without a crack. Here is a beam of one house which has thrust itself into another house. There is half of a bedstead the other half of which lies no one knows where. All the tiles of one building were huddled together in one spot on the roof, crushed and broken up as small as if they had been pounded.

HOW THE CHINESE BUILD.—In China when a contractor engages to build a house, he encloses the premises and sets up cooking apparatus to supply his hired workmen with regular meals at the most economical rates. Having taken breakfast, they work until noon, rest one hour, and leave off at 5 p. m., and return to their homes. On leaving, each takes a ticket which admits him next morning. These tickets are daily vouchers of the artisan's presence. Counted up at any time a true account is rendered. A man on the ground throws several bricks to another ten feet above, and he to another still higher. Thus the masons are supplied as they ascend with the wall. Instead of carrying mortar in a hod, it is thrown by the shovel full from one story to another to any required elevation, without spilling a particle, so expert are they by continued practice.

WHAT SHALL A WORKMAN STUDY?—In "Lectures in a Workshop," in the *Industrial Monthly*, T. P. P. says: If there is any doubt about what study or studies should be followed with a view to self culture, we can remove it by a simple rule given in these words namely: *Study your business.* By this the daily bread is to be earned; and it is highly probable that the knowledge of the trade engaged in exceeds the information on all subjects outside of it. Many men are continually attempting too much, and worry because they can not swallow whole volumes of literature and science in a few months; they are apt to slight their daily occupation as an unavoidable means of maintenance, and concentrate their efforts upon something foreign to their trade. Such men have mistaken their calling, and are wasting their time so far as self-improvement goes.

A BEAUTIFUL FRENCH ART.—A French chemist proposes a new and unique method of coloring artificial flowers. He selects colors of different tints, soluble in water, and mixes them with a clean mucilaginous gum, and then pours this out upon highly polished square glass tablets of several inches in diameter. The layer is put on uniformly, and the tablets exposed for a time to a well-heated stove. The gummy mucilage dries rapidly into a thin, polished plate, which afterward separates from the glass and falls off. It may then be reduced to a powder of any required fineness, the result obtained being remarkable for its transparency and permanency. The sheets thus obtained with aniline colors are considered especially beautiful.

HOW THEY WERE WOUNDED.—A German newspaper presents the following interesting facts with regard to the apparent efficiency of the different weapons employed by the combatants in the Prusso-French war:—

Out of 3,453 Germans wounded around Metz, ninety-five and a half per cent. were injured by the Chassepot rifle, two and seven-tenths per cent. by the artillery, and only eight-tenths per cent. by cold steel.

Among the French wounded twenty-five per cent. were wounded by the German artillery, seventy per cent. by small arms, and five per cent. by cold steel.

These figures themselves tell a very remarkable story.

The same paper pretends that in the whole course of the war twenty-five thousand French were hit by the German artillery, so that, on comparing the number of wounded with the number of shots fired, the conclusion is inevitable, that for every three discharges of a German cannon at least one Frenchman was killed or more or less injured.

According to the statistics of the German wounded, the following proportion has been established in an official manner:

Ninety per cent. of men were hit among the infantry; five per cent. in the cavalry; three per cent. in the artillery; and two per cent. in all the other branches of the service.

As these results have been confirmed by every course of investigation made up to the present time, they establish what had been previously asserted—first, that the Chassepot rifle is superior to a needle gun Dreyse fusil; second, that the breech-loading German artillery is superior to the muzzle-loading French.

The second proposition has never been questioned, viz., the overwhelming superiority of the German batteries.

PROGRESS OF THE MANUFACTURING INTERESTS. At the Engine Builders' Convention lately held at Cincinnati, General Leggett said: "Manufacturing as it now exists in this country, is the development of the last thirty or forty years. Forty years ago, there was a blacksmith and shoe-maker in every school district, and at every cross-road all over the land. The blacksmith made horse shoes and nails, plow points, hoes, shovels, pitch forks, hinges and latches, nearly all of the builders' hardware, and much of the cutlery used. Then he was a manufacturer—his own employer and employee. Now, farmers' tools, builders' hardware, and household utensils are made in large establishments, and the village and country blacksmith have become mere tinkers, and do little more than mend or repair. The cross-roads shoemakers have degenerated into cobblers, only making an occasional pair of boots or shoes to accommodate deformed feet, not provided for in dealers' cases. Nearly all our boots and shoes are made in immense factories—some single establishments turning out over six thousand finished pairs a day. The same is true of almost every department of manufacturing.

BROWN TINT FOR IRON AND STEEL.—Dissolve in four parts of water, two parts of crystallized chloride of iron, two parts of chloride of antimony, and warm the brass over the flames of a Bunsen burner or a spirit lamp, and plunge it while hot into nitric acid for two or three seconds. Then return it to the flame, and heat it till it blackens, brush off blisters, and lacquer. Another way is to use a liquid containing two parts of arsenious acid, four parts of hydrochloric acid, and one part of sulphuric acid in eighty parts of water.

Zinc may also be given a fine black color by cleaning the surface with sand and sulphuric acid, and immersing for an instant in a solution composed of four parts of sulphate of nickel and ammonia in forty of water, acidulated with one part of sulphuric acid, washing and drying. The black coating adheres firmly, and takes a bronze color under the burnisher.

NEW USES FOR SOLUBLE GLASS.—The employment of soluble glass, in the chemical and industrial arts, is constantly increasing, and its value is now fully established. Recently, a cement of great hardness and various applicability has been produced by mixing different bases with this singular substance. It is found that, combined with fine chalk and thoroughly stirred, it will produce a hard cement in the course of six or eight hours; with fine sulphide of antimony, a black mass is produced which can be polished with agate, and then possesses a superb metallic lustre. Fine iron dust gives a gray-black cement. Zinc dust produces a gray mass exceedingly hard, with a brilliant metallic lustre, so that broken or defective zinc castings can be mended and restored.

GOLD IN SEA-WATER.—Careful experiments made upon water taken at different times from Ramsey Bay, Isle of Wight, show that seawater contains about one grain of gold to each ton of water. It is held in solution as a chloride. The presence of eliver in the ocean in still larger quantities has long been known.

TRANSPARENT SOAP is made by thoroughly drying soap cut in thin shavings in an oven, then pulverizing and dissolving it in high-proof alcohol, and finally distilling off the latter till the soap will solidify into cakes.

BLACK AND WHITE.—Experiment proves that white letters on a black board are seen at a longer distance and always more clearly than black letters on a white board.

GOOD HEALTH.

Strength and Health.

It is quite a common idea that health keeps pace with strength. I know intelligent persons who really think that you may determine the comparative health of a company of men by measuring their arms—that he whose arm measures twelve inches is twice as healthy as one who measures but six. This strange and thoughtless misapprehension has given rise to nearly all the mistakes thus far made in the physical culture movement. I have a friend who can lift nine hundred pounds and yet is an habitual sufferer from torpid liver, rheumatism and low spirits. There are many similar cases. The cartmen of our cities, who are the strongest men, are far from the healthiest class, as physicians will testify. On the contrary, I have many friends who would stagger under three hundred pounds that are in capital trim. But I need not elaborate a matter so familiar to physicians and other observing people.

No test of health would prove more faulty than a tape line or a lift at the scale beam. Suppose two brothers—bank clerks—in bad health. They are measured around the arm. Each marks exactly ten inches. They try the scale beam. The bar rises at exactly three hundred pounds with each. Both seek health. John goes to the gymnasium, lifts heavy dumb bells and kegs of nails until he can put up one hundred and twenty-five pounds and lift nine hundred, and his arm reaches fifteen inches. Thomas goes to the mountains, fishes, hunts, spends delightful hours with the young ladies, and plays cricket. Upon measuring his arm we find it scarcely larger than when he left town, while he can't put up sixty pounds nor lift five hundred. But who doubts Thomas will return to the bank counter the better man of the two? John should be the better man if strength is the principal or most essential condition of health.

A circus usually contains among its performers a man who can lift a cannon weighing nearly or quite half a ton. Then there is a half a dozen riders and vaulters, who have comparatively little strength. If any one supposes that the strong man has better health than the flexible, elastic ones, he has but to make inquiries of circus managers, as I have done, and he will learn that the balance is found almost uniformly with the latter. Agility and flexibility are far more important than strength, and that fine silken quality of the muscular fibre, which comes only from an infinite repetition of light and ever varying feats, is far more important than size.—*Dio Lewis*, in "To-Day."

Pneumonia.

Pneumonia is an inflammation of the lungs attended with fever. Sometimes the fever is of the diathesis termed inflammatory, and sometimes of the low diathesis to which the term typhoid is applied. In either case the chief trouble and danger wholly consist (aside from treatment) in engorgement of the lungs. They are so congested with accumulated blood that breathing is laborious, the cough severe and distressing, and the expectoration difficult. The fever may be mild or violent. But in all cases the essential point in the treatment is to relieve the overloaded vessels of the lungs. This is to be done, not by taking the blood out, nor blistering the skin, nor poisoning the stomach, but simply by determining the circulation from the lungs to other parts of the body, and freeing the whole mass of blood of its effete and viscid matters. And all this can be accomplished by balancing the temperature steadily at or near the normal condition standard. In a day or two, sometimes in a few hours, and in the worst cases within a week, the patient will be fairly convalescent.

The structure of the lungs being spongy and elastic so as to allow all the blood in the body to pass through them once in three minutes, enables them to bear an immense degree of engorgement without disorganization.

The psin in the lungs may be very severe, the cough extremely violent, the breathing exceedingly distressing, the fever intense and the patient utterly prostrated, with no danger of dying, providing nothing is done amiss, for the excretory organs are gradually casting out the impurities from the whole mass of blood and the myriads of little glands in the lungs themselves are unloading the congested vessels by the process of expectoration, so that in due time the trouble is removed and the patient (not the disease) is cured.

In order to maintain the balance of circulation so that "nature" can perform her remedial work successfully, the surface must be frequently bathed with water of a temperature suited to the circumstances of each case, the rule being, the warmer the surface or any part of it, the cooler the water, and vice versa.—*Science of Health.*

SUBSTITUTE FOR QUININE.—It is said that the Brazilian doctors now use the juice of the famous Eucalyptus plant as a substitute for quinine, and with astonishing success; in fact it threatens to supersede the famous febrifuge. When Eucalypti are planted no fever of any kind appears. There can be no stronger stimulus to push on the culture of this beautiful and swift growing tree in this country.

The Man of Long Life.

He has a proper and well-proportioned stature, without, however, being too tall. He is rather of the middle size, and somewhat thick set. His complexion is not too florid; st any rate, too much ruddiness in youth is seldom a sign of longevity. His hair approaches rather to the fair than the black; his skin is strong, but not too rough. His head is not too big; he has large veins at the extremities, and his shoulders are rather round than flat. His neck is not too long; his abdomen does not project; and his hands are large, but not too deeply cleft. His foot is rather thick than long; and his legs are firm and round. He has also a broad, arched chest, a strong voice, and the faculty of retaining his breath for a long time without difficulty. In general there is a complete harmony in all parts. His senses are good, but not too delicate; his pulse is slow and regular.

His stomach is excellent, his appetite good, and his digestion easy. The joys of the table are to him of importance; they tune his mind to serenity, and his soul partakes in the pleasure which they communicate. He does not eat merely for the pleasure of eating, but each meal is an hour of daily festivity; a kind of delight, attended with this advantage, in regard to others, that it does not make him poorer, but richer. He eats slowly, and has not too much thirst. Too great thirst is always a sign of rapid self-consumption.

In general, he is serene, loquacious, active, susceptible of joy, love and hope; but insensible to the impressions of hatred, anger and avarice. His passions never become too violent or destructive. If he ever gives way to anger, he experiences rather a useful glow of warmth, an artificial and gentle fever without an overflow of the bile. He is fond also of employment, particularly calm meditation and agreeable speculations, is an optimist, a friend to nature and domestic felicity, has no thirst after honors or riches, and banishes all thoughts of to-morrow.

HYGIENIC NOTES — REMEDY FOR PAINFUL WOUNDS.—The enclosed is excellent, and ought to be published once a year. I found it in a paper sometime ago, and have tried it and can recommend it from experience: Take a pan or shovel with burning coals, and sprinkle upon them common brown sugar, and hold the wounded part in the smoke. In a few minutes the pain will be allayed, and recovery proceeds rapidly. In my case, a rusty nail had made a bad wound in the bottom of my foot. The pain and nervous irritation was severe. This was all removed by holding it in the smoke for fifteen minutes, and I was able to resume my reading in comfort. We have often recommended it to others with like results. Last week, one of my men had a finger-nail torn out by a pair of ice-tongs. It became very painful, as was to have been expected. Held in sugar-smoke for twenty minutes, the pain ceased, and promised speedy recovery.—*Rural New Yorker.*

DIETETIC HINTS.—Most chronic diseases, and many acute ones, are produced at the table. As a rule, no food of any kind should be taken at the table, especially if the stomach is weak. The stomach should never be overloaded, not more than two or three articles should be taken at one meal; no stimulants used before eating; tobacco arrests digestion. Milk is the best diet for infants and children. Tomatoes with cream and sugar are healthy and nutritious. Bread and butter is the staff of life, and easily digested. Too much salt irritates the stomach. Colds are frequently produced by drinking hot tea and exposure afterwards. Late suppers induce heart disease. Pastry and cakes constipate the bowels. Boiled potatoes are not as healthy as baked ones. Fruits are to be eaten at breakfast and dinner. The stomach requires much rest to be healthy; purgative medicines weaken the bowels. Cheerful conversation promotes digestion; anger prevents it.

CURE FOR THE OPIUM HABIT.—In a recent report on the condition of the English hospital at Peking, China, the attending physician gives a formula for "anti-opium pills." This remedy is composed of extract of henbane, extract of gentian, camphor, quinine, cayenne pepper, ginger and cinnamon, with castile soap and syrup to form the coating. The efficacy of these pills in overcoming the opium habit, and in preventing the suffering on giving up the use of that poison, is stated to have been proved in numerous cases. The native remedies, it is said, contain opium in some form, and meet frequently the ashes of opium already smoked, and consequently are inefficacious—it being as difficult to discontinue the use of the medicine as of the drug itself.

AMMONIA FOR WHOOPING COUGH.—Since it has been shown that the inhalation of air changed with the vapors of ammonia are beneficial in cases of whooping cough, M. Groutham, of Paris, has been experimenting on the effects of boiling strong ammonia in the room where the patient was, with decided success.

FRUIT AND INTEMPERANCE.—A medical writer remarks that he has never known a person decidedly fond of fruit who became intemperate; and he considers the two tastes as naturally antagonistic.



B. EWER.....SENIOR EDITOR.

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San Francisco:

Saturday Morning, Jan. 18, 1873.

Legal Tender Rate.—S. F., Thurs., Jan. 16,—buying 89½; selling 89¾.

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A NEW YEAR'S GIFT.—The Pioneer (woman's journal), makes mention of a pleasant little affair which recently happened in our office, which we hesitated to make notice of. Mr. McCarty is one of our most efficient agents, and appreciating his services, it gives us pleasure to be able to insert the following:

We like to see newspaper men rewarded on this earth, as it is not at all probable that heaven will confer upon them its choicest blessings. We are swelled with pride, then, to know that that genial and urbane gentleman, L. P. McCarty, agent and traveling correspondent of the *MINING PRESS* and other journals published by Dewey & Co., of this city, has been the recipient from the proprietors, of a heavy gold chain and a beautiful gold locket with quartz setting, as a New Year's present. Mr. McCarty well deserves this generous appreciation. His host of friends will be glad to learn that he has been so handsomely done for. By the way, will none of the angelic lady spirits take pity on Mc and marry him. It's an unspeakable agony to see such healthy bachelors running around wild with nobody to sew on their buttons or broomstick them."

A NEW FIRE ESCAPE.—We were present to witness the operation of a new "Fire Escape," in front of the Occidental Hotel on Wednesday. We did not learn who the inventor is, or but little in relation to it. It was evident however that with the aid of a line or cord and an exceedingly small apparatus, which we did not get the chance of examining, that a person can let him or herself down from any height of windows with safety and dispatch, requiring less than two minutes to open the window, attach the rope and descend safely to the ground. We shall probably notice it further.

A BANKRUPT MINING COMPANY.—The South Gulch Gravel Mining Company has filed a petition in bankruptcy, praying that the company get the benefit of the Insolvent Act. The debts are \$1,083.67 and no assets. The property and privileges, in Calaveras county, were sold by the Sheriff in August, 1872, and all the interest the company have, is the right of redemption.

Management of Incorporated Mining Companies.

In our issue of the 28th ult., we published an article in which brief allusion was made to the manner in which a few unscrupulous men had completely monopolized the control of the mining interests of this coast, and how, for years, by virtue of their positions as trustees of nearly all our prominent mining companies, they had continued their nefarious practices, plundering without the slightest sense of shame, or shadow of remorse, everyone outside of their own clique, whom by any means they could induce to invest their hard-earned dollars in worthless mining stocks, or on some swindling scheme, gotten up for the sole purpose of fleecing the unwary. To those who have not long resided among us, or even to old Californians who have held aloof from mining speculations, and are consequently ignorant of the dishonest tricks these men have recourse to, some of our remarks may appear a little harsh, or unnecessarily severe. They cannot imagine how such men could long be tolerated in the community, and in their innocence suppose that the strong arm of the law would be stretched forth to check them in their career, and mete out that punishment they so richly merit. We know, however, that instead of the striped suit of the felon, that they dress in purple and finelinen, and fare sumptuously every day.

It is only reasonable to suppose that there must be an end to all this kind of thing; the victims will lose patience as well as money; the supply of greenhorns will fail or they will no longer be in a position to come up with their regular assessments. We much fear that unless some vigorous and decisive measures are speedily adopted, a crisis is inevitable which will result in the abandonment of some of our most promising mining districts, and the financial ruin of the State of Nevada. Time was when the well-to-do farmer or mechanic, wealthy merchant or real estate owner, was not afraid to invest a little of his surplus cash in mines; he considered the speculation entirely legitimate and went in in good faith, looking forward to the time when his dividends should return him a handsome interest on the money invested by him. How very few of such men ever received a dollar in the shape of dividends. They waited patiently, year after year, paid thousands of dollars in the way of assessments, and at last having become wearied and disgusted at the manner in which their property was mismanaged, they sold out, sadder, and poorer men; of course they were intimate with the President of the company and some of the trustees, and they could depend on them; they would always be well posted, etc., etc.

It is the old story; they found that their money instead of being judiciously expended in the purchase of machinery and on the development required by the mine, was used to secure the re-election of the old corrupt board of trustees, and squandered by fast superintendents. In the present age we find that money is all powerful, and the possessors of it can do many things with impunity which, a few years ago would have banished them forever from the society of honest men.

But a few weeks ago one of our leading mining speculators, whose name was prominently connected with the diamond swindle, was being examined by a special committee appointed for that purpose; he stated that "it was not the intention of the promoters of that enterprise to do anything on their grounds, until spring; that they required time to raise the funds necessary to secure the legislation they desired," etc. In other words to buy the United States Senate and Congress. No doubt the gentleman who was testifying knew what he was talking about. He had been on the Comstock since 1859, and he knew exactly what it cost to secure a decision, in his day, from a Washoe District Judge.

All these things are working sadly against our prosperity as a mining community, and unless some radical reforms are speedily effected in our mining laws, and in the management of our incorporated companies, the mines on the Pacific coast, with the exception of those held by English capitalists, will be entirely controlled by a few corrupt California stock speculators. When outsiders no longer invest their money, there will be but little left for the brokers to do, and the small fry which now eke out a precarious livelihood selling wild-cat on

the curbstone will have to look out for honest employment.

Whether some modification of the English mining laws, as they exist in Australia, and which work so admirably in that country, cannot be successfully applied here, or not, is a question well worthy the attention of our lawmakers. They certainly are not opposed in any way to the republican institutions of this country, and afford equal protection to the rights of the miner, and the capitalist.

Coal Lands.

A correspondent writes us as follows: "As you are pretty good authority on mining matters, I take the liberty of asking you the following questions: If I find a coal vein in ground belonging to another party, can I take the ledge up, or can I claim any portion of it for the right of discovery?"

Both queries may be answered by the familiar maxim, "*Cuius est solum est usque ad Caelum, et usque ad Orcum*," the free translation of which is: He to whom property belongs, holds the absolute right on the same to Heaven and to Hell. The right to mine for precious metals can only be exercised upon public lands, and, as a general rule the public mineral lands of the State are open to the occupancy of every person, who in good faith, chooses to enter upon them for the purpose of mining. The same rule applies to coal lands. If title has passed out of the government, and the lands have become the vested property of a private person, or private persons, no right of entry for mining purposes can be made without the consent of the owner.

There are two statutes relating to the manner in which coal lands may be obtained in this State. The first is entitled, "an Act for the disposal of coal lands, and of town property in the public domain," approved by Congress, July 1st, 1864. The provisions therein relating to coal lands is as follows: "That where any tracts, embracing coal beds or coal fields, constituting portions of the public domain, and which as mines are excluded from pre-emption by the act of 1841, and which under past legislation are not liable to ordinary private entry, it shall and may be lawful for the President to cause such tracts, in suitable legal subdivisions, to be offered at public sale to the highest bidder, after notice of less than three months at a minimum price of \$20 per acre; and any lands not thus disposed of shall thereafter be liable to private entry at said minimum."

The second statute is entitled, "an Act supplemental to the Act approved July 1st, 1864, for the disposal of coal lands, etc.," and provides with regard to coal lands as follows: "That in case any citizen of the United States, who at the passage of this Act, may be in the business of bona fide actual coal mining on the public lands, except on lands reserved by the President of the United States for public uses for purposes of commerce, such citizen upon making proof satisfactory to the Register and Receiver to that effect, shall have the right to enter, according to legal subdivisions, a quantity of land not exceeding 160 acres to embrace his improvements and mining premises, at the minimum price of \$20 per acre, fixed in the coal and town property Act of July 1st, 1864," provided, that when mining improvements and premises are on land surveyed at the passage of this Act, a sworn declaratory statement, descriptive of the tract and premises, showing also the extent and character of the improvements, shall be filed within six months from date of this Act; and proof and payment shall be made within one year from date of entry filing; but where such mining premises may be on lands hereafter to be surveyed, such declaratory statement shall be filed within three months from the return to the district Land Office of the official township plat; and proof and payment shall be made within one year from the date of such filing."

This is a supplemental Act to Act of 1864, enacted by Congress and approved March 3d, 1865. Said Acts of 1864 and 1865 are the only ones relating to the mode of taking up coal beds or coal fields. The provisions speak for themselves. They are of a special nature and very imperfectly define or give rights to discoverers of coal beds or lands at the present time. An Act was introduced at the last session of Congress to cover all the present defects and to make ample provision for those desiring to mine for coal. The bill failed to pass but another attempt is to be made at the present session of Congress. The queries made by our correspondent may be answered by the direct negative "No."

A New California Invention — Kane's Burglar Alarm.

We had the pleasure of seeing this week a new California invention, which is the best of its kind we have ever seen. It is called Kane's Flash-Light Burglar Alarm. The machinery is simple in its mechanism, and of superior finish, being encased in cabinet-work of black walnut. It is designed to be placed in a front window of the second story of warehouses, stores, factories, etc., to prevent its being tampered with, and in the halls of private dwellings, and is connected by wires with the doors, windows and other means of ingress, which are fastened by a simple movement, and can be thrown off at pleasure. When a burglar attempts to enter, the connecting wire is necessarily moved, which throws off the starting-har of the alarm works, and the machinery being thus operated, rings a very loud alarm, two hammers striking the gong; at the same time a flash-light is struck, which communicates with a steady light in front of a powerful reflector, thus indicating to the police or watchman, the building entered. The light alone serves to illuminate private dwellings, and saves the trouble of striking a light in the confusion and excitement caused by the discovery of burglars. Connection can also be made from a dwelling to a stable, thereby protecting horses, etc.

The machine is very simple in its mechanism, no electric battery being used. A connection on the door or window operates a bell crank, which has a wire connecting with the alarm box. The box contains a large gong, which would up will ring 1,000 strokes. When the machine is set in motion by the spring set loose by the wire, a hammer like that on a gun explodes a cap, which ignites a fuse connected with a candle and lights it. Behind this candle is a powerful reflector which illuminates the premises. The cutting of the connecting wire produces the same effect as a pressure against it—something which has never been accomplished by any other alarm. It is set at night when the family retire by a simple movement of the band, and if the windows or doors are opened the wires set the mechanism in motion. Chief of Police Crowley recommends it as one of the best inventions of its kind. It was patented by James J. Kane, of this State, and may be seen at Linforth, Kellogg & Co.'s, Nos. 3 and 5 Front street. The apparatus is really worth examining, as an ingenious and simple piece of mechanism, if for no other reason.

THE EXERCISOR PUMPS.—The attention of our readers has frequently been called to these pumps, which are conspicuous among the great numbers in the market as cheap and effective ones. The ship pump, a representation of which will be found in our advertising columns, is now being made in Philadelphia and has been adopted in Messrs. Cramp and Sons' large new iron ships; by Hussey, Jones & Co., Wilmington, Delaware; and the Philadelphia and Redding Railroad Company which contemplates building 80 iron ships and have already built two, have adopted it; and also use it wherever necessary on their road. The other styles are being rapidly introduced throughout the Middle and Western States for manufacturing and domestic purposes. The best engineers and mechanics in the East pronounce it unqualifiedly the best pump for hand purposes in the world. It is much used in mining and prospecting enterprises.

MORE TIN.—We frequently hear of tin discoveries on this coast, but repeated failures have taught people to be cautious how they accept the assertions of ignorant people as to richness and extent of deposits. The Utah tin excitement a year or so ago was the last of any prominence, and it proved to be an excitement and nothing more. We hear now through the San Bernardino *Guardian* of the discovery of a new tin mine about 12 miles southeast of that place. The *Guardian* says that "experts" pronounce it to be of the very best quality of tin ore, surpassing in richness any yet discovered in that county. If tin of any extent exists at all in the State it will probably be found in San Bernardino county, as there are mines there now, but we have yet to hear of any large fortunes being made from them. A really good tin mine would be of immense value to the State and we hope some day that some of these discoveries will be developed in a manner to prove their value.

BULLION.—There are 18,000 bars of bullion at Cerro Gordo, Swansea and Cartago awaiting shipment. Some 12,000 bars have been shipped by steamer across the lake to Cartago. The bullion is valued at \$600,000. These shipments used to come to this city via Los Angeles.

The Chronicle's Lightning Press.

As we are always interested in any mechanical improvements on this coast, and especially when they are connected with the "art preservative," we give place in this issue to a representation of the Hoe four-cylinder press which has recently been purchased for the San Francisco Chronicle. These presses are designed for the publication of large editions and fast daily newspaper work, and are a marvel of mechanical skill. Although complicated and extensive the press in question ran as smoothly and well when first erected as it does at present. The Chronicle describes the press as follows:

"In the center is a large iron cylinder upon which the type is placed, the 'turtles,' each of which is a segment of a circle, the type being fitted snugly and securely in their places. These 'turtles' hold the type in place after the forms are made up and are placed in the plane made for them on the cylinder. On each side of the central cylinder are two smaller ones, and over each of these the 'feed-boards' are placed, the lower ends almost touching the cylinder. On these boards the paper is laid and the four feeders take their places and pass each sheet to the press. On starting, the great central cylinder revolves rapidly, carrying the types from one to another of the small cylinders each of which meets it with a spotless sheet of paper, which receives the impression and is borne away on a perfect net work of tapes and laid on a board at the end of the press. Four sets of rollers for inking the type are placed in such a manner that immediately after one impression is taken, the forms pass under the rollers and receive a fresh supply of ink before coming in contact with the next cylinder. Altogether the improvements in the Chronicle have cost about \$40,000, as far as actual outlay is concerned, but general improvement in the whole paper have cost far more than that in the expenditure of energy, perseverance and time."

The Chronicle, our enterprising cotemporary, well known as the "live paper," a few weeks since moved its quarters from the building next door to the editorial rooms of the MINING AND SCIENTIFIC PRESS to the one opposite, which extends through from Clay to Commercial. The establishment is now the most complete in all its departments on the coast. The editorial rooms are neatly furnished, the composing room light and well ventilated and the press and folding rooms convenient and commodious. The most prominent improvement, however, is the new press, which is supplied with all the late improvements. It covers a space of thirty-three feet in length by sixteen in height and fourteen in breadth. There are over 60,000 separate pieces in the machine, and the total weight is 14 tons.

The young proprietors (Messrs. Do Young) were not long ago "boys" in moderate circumstances and deserve great praise for their indefatigable efforts to build up the institution which they founded. The circulation of the Chronicle has rapidly increased, and its late grand improvements will doubtless give it a new impetus and increased favor with the wide-awake public.

SUGAR SUPPLIES OF THE WORLD.—The constantly increasing demand for engare, a demand which more than keeps pace with the growth of population, is constantly calling for new sources of supply. In this regard the cultivation of Beet Root in California becomes most important. In many countries of Europe the home market is entirely supplied from this source. Austria which thirty-five years ago imported all her sugars now not only supplies herself but exports largely, and some towns in North Germany and France are entirely supported by the beet root sugar manufacture. But we are not entirely dependent on beets, for the Chinese sugar grass will grow all over the State, and there is no doubt that with irrigation the sugar cane will thrive in Los Angeles and San Bernardino. We hope before many years to see California noted as one of the sugar producing countries of the world.

Fish Culture.

Within the last six years a great deal has been said and written on the subject of fish culture, and widely extended and very successful experiments have been made resulting in establishing the fact, that where conditions are favorable, that an acre of water will yield as much profit to the owners from the sale of fish, as is usually derived from an acre of land cultivated to grains or vegetables.

Among the varieties of fishes most cultivated in the rivers and ponds of the East, we notice the salmon and shad for the larger rivers and for brooks, ponds and the little lakes that

he also combines faultlessness in all others. Hence it is that he is the favorite among fishes, and deserves to be so.

Trout are peculiarly suited to domestication, being very hardy, easily tamed, conveniently confined, satisfied with plain food, well adapted to artificial breeding, prolific enough to increase rapidly, and having a sufficiently high value as live game, or as a table luxury, to make it worth while to raise them."

The illustration which we present herewith is a view of the hatching house at Cold Spring Trout Ponds, the property of Mr. Stone, taken in 1868. The house is situated in a picturesque situation on Mount Monadnock, New Hampshire. Since that time, exceedingly interesting and important discoveries have been



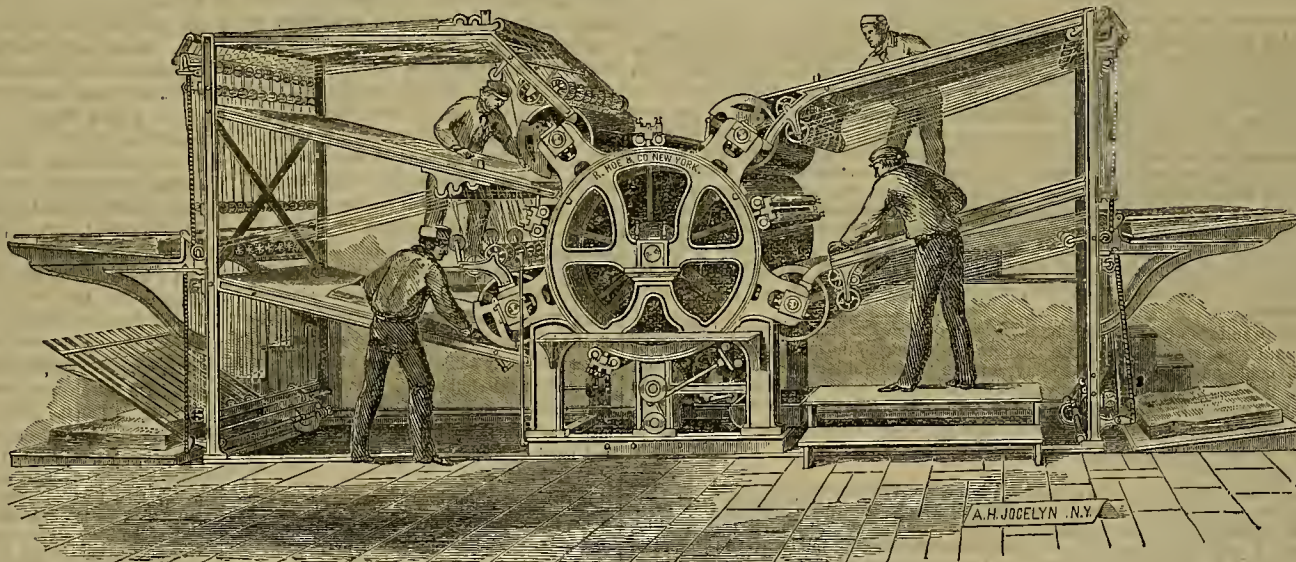
VIEW OF HATCHING HOUSE AT COLD SPRING TROUT PONDS, CHARLESTOWN, N. H.

abound in New England and elsewhere at the north, the black bass and trout are pre-eminently the fish for domestic culture.

Livingston Stone, Deputy U. S. Fish Commissioner, proprietor of Cold Spring trout ponds, Charlestown, New Hampshire, and Secretary of American Fish Culturists' Association is now in this State. He has passed the summer here investigating subjects connected with fish culture, and has sent East a number

made in the hatching and culture of trout, which improvements we may introduce to our readers, with cuts illustrative, in future numbers of the Press.

There are many places in California, where valuable trout fisheries for the culture of fish for the amateur or even the general market, might be established at very little cost; but as there are certain requisites necessary, to make the business a success, it becomes a matter of



THE HOE FOUR-CYLINDER PRESS.

of fish eggs from this coast. In his admirable and standard work on Domesticated Trout he says:—

The trout has always stood at the head of the fresh water game fishes in the popular estimation. The fickle public may change its favorite some time for a more admired successor, but up to this time the trout has distanced all rivals. This honorable place he has gained and held, not by accident but by merit. He deserves to rank by himself first, for where has the trout his equal? There may be fish of nearly as fine flesh as the trout, but they have a repulsive coat like the pout; or a coarse appearance, like the bass; or a disagreeable one, like the mascalonge; or are full of bones, like the shad; or have no game in them, like the mullet; or fail somewhere to match the excellent points of the trout. There is not one of them that for perfect faultlessness can compare with the trout. This is his special peculiarity. He is faultless. He surpasses all other fish in grace of form, in beauty of coloring, in gentleness of expression, in fascination of manner, in gameness of spirit, in sweetness and firmness of flesh, and in general personal attractiveness, and to excellence in these points

interest to be informed in relation thereto, before expenditure in this line is made, and perhaps disappointment incurred, from too slight an acquaintance with the subject.

Trout culture is a grand success in the Truckee river, the outlet of Lake Tahoe, and large quantities are annually sent from thence to all parts of the State and Nevada accessible by rail. But as beef or animals' livers, hearts and lungs are the principal food of domesticated trout, where such can be procured, it is evident that the vicinity of cities or slaughtering houses where this kind of food can be surely and cheaply obtained, would be a desirable locality for trout ponds; all other requisites as an abundance of cold spring water, a natural and abundant fall and other requisites being obtainable.

*The excellent work from which the above extract is taken can be had of A. Roman & Co., Booksellers, 417 and 419 Montgomery street, San Francisco.

OVER 40,000 centals of wheat were received last week in this city and at Oakland.

The Polytechnic Course of Lectures.

The course of Thursday evening lectures, to be delivered at the Mechanics' Institute Hall this winter, have been inaugurated and the names of the lecturers decided upon. They are separate from the course now being delivered by the Professors of the State University at the same place on Saturday evenings. The initial lecture was delivered on the 16th inst. by Amos Bowman on "Pacific Coast Tertiary Geology and Fossil Man." The following are the names of lecturers, the subjects and dates of delivery: January 23d—"On the Constitution and Principal Properties of Matter," by Prof. J. M. Neri, St. Ignatius College Hall, Market street.

January 23d—There will be formed on this evening, by Henry G. Hanks, at the Mechanics' Institute, at 7.30 p.m., a class in Determinative Mineralogy, and the use of the blowpipe, including an introduction to assaying.

January 30th—"On Zoology (embracing Animal Life on the Pacific Slope)," by Dr. George Hewston.

February 6th—"On the Application of Chemistry in the Industrial Arts and Sciences," by Louis Falkenau.

February 13th—"On the Metallurgy and Local Adaption of Roasting and Smelting Processes," by Charles A. Stetefeldt.

February 20th—"On Amalgamation as practiced in the Pacific States," by Eugene N. Rhotte.

February 27th—"On Chemistry as applied to Metallurgy," by Prof. Thomas Price, at University City College Chemical Laboratory and Lecture Room, Union Square.

March 6th—"On Art and its Uses," by Benjamin P. Avery.

March 13th—"On Entomology: The Insect Foes of Agriculture," by Richard H. Stretch.

March 20th—"On California Meteorology and Sanitary Conditions," by Dr. T. M. Logan, of Sacramento.

"On Forest Distribution in the Pacific States," by H. N. Bolander. (Date to be announced.)

"On Fish and Game, etc., of the Coast, in their Economical Bearings." (Name of lecturer and date to be announced.)

The subscription to the whole course will be \$1 and the books are now open with the Librarian of the Institute, on Post street.

ACTIVITY IN THE BOILER WORKS.—Messrs. Moynihan & Aitken, of the Portland Boiler Works, in this city, are at present occupied in manufacturing six tanks for the Pacific Sugar Refinery, of considerable dimensions, being 5 feet 7 inches in diameter and 16 feet in length. This firm are also filling an order from the California Sugar Refinery for six boilers, each 54 inches in diameter and 16 feet long. Besides the above Messrs. M. & A. have in course

of construction three large boilers for the Stockton Paper Mill. This is what we call commencing the year briskly, the only difficulty that the firm experience being a want of hands, as they inform us that although now employing over fifty workmen they would be glad to increase the number to seventy-five, at least. Twenty thousand dollars worth of orders in two days is, we think, pretty good evidence that this establishment is a success.

A SUCCESSFUL PATENT.—A patent for curing tobacco, which was a short time since procured through the agency connected with this office, by J. D. Culp, has been practically applied and reported as working very successfully. The crop of 40,000 pounds of tobacco, raised by the American Tobacco Company, near Gilroy, in this State, was cured by this process and the tobacco pronounced by those having knowledge of the subject, to be of excellent quality. The process is said to be very economical and is highly recommended.

Laws Under the New Code.

Homestead Corporations.

[Time of corporate existence.]

557. Corporations organized for the purpose of acquiring lands in large tracts, paying off encumbrances thereon, improving and subdividing them into homestead lots or parcels, and distributing them among the shareholders, and for the accumulation of a fund for such purposes, are known as homestead corporations, and must not have a corporate existence for a longer period than ten years.

[By-laws must specify time for and amount of payment of installments, etc. By-laws to be furnished, etc.]

558. Such corporations must specify in their by-laws the times when the installments of the capital stock are payable, the amount thereof, and the fines, penalties, or forfeitures incurred in case of default. A printed copy of the articles of incorporation and by-laws must be furnished to any shareholder on demand.

[Advertisement and sale of delinquent and forfeited shares.]

559. Whenever any shares of stock are declared forfeited by resolution of the Board of Directors, the Directors may advertise the same for sale, giving the name of the subscriber and the number of shares, by notice of not less than three weeks, published at least once a week in a newspaper of general circulation in the city, town, or county where the principal place of business of such corporation is located. Such sale must be made at auction under the direction of the Secretary of the company. The corporation may be a bidder, and the shares must be disposed of to the highest bidder for cash. No defect, informality, or irregularity in the proceedings respecting the sale invalidates it, if notice is given as herein provided. After the sale is made the Secretary must, on receipt of the purchase money, transfer to the purchaser the shares sold, and after deducting from the proceeds of such sale all installments then due, and all expenses and charges of sale, must hold the residue subject to the order of the delinquent subscriber.

[May borrow and loan funds. How, and for what time.]

560. Homestead corporations may borrow money for the purposes of the corporation, not exceeding at any one time one-fourth of the aggregate amount of the shares or parts of shares actually paid in, and the income thereof; no greater rate of interest must be paid therefor than twelve per cent. per annum. For the purpose of completing the purchase of lands intended to be divided or distributed, they may borrow on the security of their shares on the land thus purchased, or that owned by the corporation at the time of procuring the loan, any sum of money which, together with the interest contracted to become due thereon, will not exceed ninety per cent. of the unpaid amount subscribed by the shareholders, but no loan must be made to the corporation for a term extending beyond that of its existence.

[Minor children, wards, and married women may own stock.]

561. Such shares of stock in homestead corporations as may be acquired by children, the cost of which, and the deposits and assessments on which are paid from the personal earnings of the children, or with gifts from other than their male parents, may be taken and held for them by their parents or guardians. Married women may hold such shares as they acquire with their personal earnings, or those of their children, voluntarily bestowed therefor, or from property bequeathed or given to them by persons other than their husbands.

[Forfeiture for speculating in or owning lands exceeding two hundred thousand dollars.]

562. Homestead corporations must not purchase and sell, or otherwise acquire and dispose of real property, or any interest therein, or other personal property, for the sole purpose of speculation or profit. Nor must any such corporation at any one time own or hold, in trust or otherwise, for its purposes, real property, or any interest therein, which in the aggregate exceeds in cash value the sum of two hundred thousand dollars. For any violation of the provisions of this section, corporations forfeit their corporate rights and powers. On the application of any citizen to a Court of competent jurisdiction such forfeiture may be adjudged, and the judgment carries with it costs of the proceedings.

[When corporation is terminated and how.]

563. Except for the purpose of winding up and settling its affairs, every homestead corporation must terminate at the expiration of the time fixed for its existence in the articles of incorporation, or when dissolved, as provided in this Part. No dividend of funds must be made or termination of its corporate existence, until its debts and liabilities are paid; and upon the final settlement of the affairs of the corporation, or upon the termination of its corporate existence, the Directors, in such manner as they may determine, must divide its property among its shareholders in proportion to their respective interests, or, upon the application of a majority in interest of the stockholders, must sell and dispose of any and all of the real estate of the corporation upon such terms as may be most conducive to the interests of all the stockholders, and must convey the same to the purchaser, and distribute the proceeds among the shareholders, or may at any time, when best for the interests of all the shareholders, cause the lands of the corporation to be subdivided into lots and be distributed, by sale for premiums, at auction or otherwise, among the shareholders.

[Payment of premiums.]

564. Such premiums on lots may be made payable at the time they are bid off, and, if not so paid on any lot of land, the Directors may immediately offer the same for sale again. If made payable at a future day, and any shareholder fails to pay his bid on the day the same is made due and payable, the Directors may advertise and sell the shares of stock representing the lots of land on which the premiums remain unpaid, in the manner provided in the by-laws for the sale of shares on account of delinquent installments and premiums.

[Annual report to be published.]

565. The actual financial condition of all homestead corporations must, by the Directors thereof, be published annually in the [a] newspaper published at the principal place of business of the corporation, for four weeks, if published in a weekly, and two weeks, if published in a daily. The statement must be made up to the end of each year, and must be verified by the oath of the President and Secretary, showing the items of property and liabilities.

[Publication in certain cases.]

566. In any case in which a publication is required, and no newspaper is published at the principal place of business, the publication may be made in a paper published in an adjoining county.

Water and Canal Corporations.

[Corporation may obtain contract to supply city or town.]

548. No corporation formed to supply any city, city and county, or town with water must do so unless previously authorized by an ordinance of the authorities thereof, or unless it is done in conformity with a contract entered into between the city, city and county, or town and the corporation. Contracts so made are valid and binding in law, but do not take from the city, city and county or town the right to regulate the rates for water, nor must any exclusive right be granted. No contract or grant must be made for a term exceeding fifty years.

[Duties of Corporation. Rates fixed by Commissioners.]

549. All corporations formed to supply water to cities or towns must furnish pure fresh water to the inhabitants thereof for family uses, so long as the supply permits, at reasonable rates and without distinction of persons, upon proper demand therefor; and must furnish water, to the extent of their means, in case of a fire or other great necessity, free of charge. The rates to be charged for water must be determined by a Board of Commissioners, to be selected as follows: Two by the city and county, or city or town authorities, and two by the water company; and in case they cannot agree to the valuation they must choose a fifth member of the Board; if the four Commissioners cannot agree upon a fifth, then the County Judge of the county must appoint such fifth person. The decision of the majority of the Board determines the rates to be charged for water for one year, and until new rates are established. The Board of Supervisors, or the proper city or town authorities, may

prescribe other proper rules relating to the delivery of water, not inconsistent with the laws of this State.

[Right to use streets, ways, alleys, and roads.]

550. Any corporation created under the provisions of this Part, for the purposes named in this Title, subject to the reasonable direction of the Board of Supervisors, or city or town authorities, as to the mode and manner of using such right of way, may use so much of the streets, ways, and alleys in any town, city, or county, or any public road therein, as may be necessary for laying pipes for conducting water into any such town, city, or county, or through or into any part thereof.

[To build and keep bridges in repair.]

551. Every water or canal corporation must construct and keep in good repair, at all times, for public use, across their canal, flume or water pipe, all of the bridges that the Board of Supervisors of the county in which such canal is situated may require, the bridges being on the lines of public highways and necessary for public uses in connection with such highways; and all waterworks must be so laid as not to obstruct public highways.

Our Gold and Silver Product.

But few people outside of the States and Territories of the Pacific Slope, have any very correct idea of the vast amount of gold and silver that has been produced on this coast during the last twenty-seven years. Even Californians themselves are astonished, when they figure up the yield of the placers and quartz mines, and the silver lodes of this wonderfully rich country. In our eager search for wealth, we lose sight of the vast sums annually extracted, and only when our attention is called to the financial condition of the world, do we stop to consider that a large portion of all the gold and silver now in circulation in the various nations of the earth has been produced on this coast. It is then we learn that we have made the world rich by the immensity of treasure which we have poured into the circulating channels of trade and commerce. Four hundred and ten millions of coin is annually required to conduct the commerce of Great Britain. This is a large sum; but we have sent three times that amount abroad since the opening of our mines, and at least one half of it has found its way, directly or indirectly, to that country. The amount of gold and silver coin in the world, has probably a value of about two billion dollars. Of this vast sum, about seven hundred million dollars has been coined in the United States, and added to the general circulation since 1847, fully one-half of it, or more, having been coined from the gold and silver of this coast.

The amount of gold and silver produced on this coast cannot be ascertained to such a critical nicety as to satisfy the over scrupulous, but counting the bullion exports, comparing them with the receipts as far as they have been published, and making due allowance for gold taken out of the country in the form of dust and nuggets, etc., we find that this coast has produced about one billion two hundred and twenty-five million dollars. This is almost an incredible sum; the significance of it can scarcely be realized. This enormous amount of bullion has principally been produced in this State, and at least four-fifths of the whole sum has been gold, the remaining one-fifth of silver having been obtained in small quantities in California, but principally in Nevada. Our bullion yield has never fallen below fifty millions of dollars, while it has frequently reached the sum of from sixty to seventy millions annually. Last year it was estimated at something like seventy two millions, and for the year now closing, many estimate the yield still higher.

In speaking of the immense yield of the Comstock, the export of coin, etc., a paper remarks that

"THE WONDERFUL MINES OF COMSTOCK,

Whose yield in twelve years has added to the argentiferous wealth of the world, the most incredible amount of one hundred and fifty million ounces, representing about the same number of dollars. Discovered in 1860-61, and yielding in the latter year, bullion to the value of six million dollars, it reached a yield of twelve million dollars in 1863, and sixteen million in 1867. Enough gold and silver has been raised in the Pacific States since 1847 to give two thousand dollars to every man, woman and child in the State, and six thousand dollars to every male adult. With such an abundance of wealth, our people have been remarkably liberal; they have not kept their treasures by them, but have sent them to every part of the earth in exchange for luxuries formerly accessible to only kings and princes. By much the greater part of our bullion has been exported. We have got rid of in this way, up to the present time,

ONE THOUSAND AND THIRTEEN MILLIONS OF DOLLARS.

In the first two years of our existence we sent abroad in this way, sixty-six millions; in 1851

and 1852, over ninety millions; and since then amounts equaling in value, from seventeen to fifty-five millions seven hundred thousand yearly; the latter, the largest export, having taken place in 1864. Of the total, the East has taken the largest share, over one-half—not less in round numbers than six hundred million dollars have been sent thither since 1850. One hundred and ninety million dollars has been poured into the bank vaults and coffers of Great Britain during the same interval. China, that reservoir of the precious metals, into which, as the waters of great rivers pour into some giant lake, without outlet, has taken over seventy-seven millions since 1855. Of the balance we have sent about nine millions to Panama, nearly one million dollars to the Philippines, seven hundred and twenty thousand to Mexico, one million seven hundred thousand to Central America, about a million and a half to the Sandwich Islands and to Chile, and the balance to Australia, Peru, Calcutta, the Society Islands, Havana, British Columbia and various other countries. California and Nevada have thus been the golden and silver sources whence

RIVERS OF WEALTH

Have poured over nations—over continents—and these sources, be it remembered, have been ones that never have failed or materially lessened for a quarter of a century. Of this great outward flow, of these Plutonic streams, a considerable proportion, particularly of late years, has consisted of

COIN,

Particularly of gold coin; for the greater part of the silver has been exported in the form of bullion. About one-fourth of all the gold discovered on the coast has been coined in San Francisco, and a much larger proportion in the other Mints of the United States. The value of gold coin issued from this Mint up to the beginning of the present year has amounted to \$312,681,713.04, and that issued from all the Mints of the United States, made from gold mined on the Pacific slope, has amounted to upwards of seven hundred millions of dollars—seven-eighths of all the gold coined in the United States since the declaration of independence. And of all the silver coined in the United States since 1841, equaling in value \$16,210,582.32, the Pacific States and Territories have supplied one-half nearly, of which, \$6,974,925, have been issued from the Branch Mint in this city. Of all the gold coined in this city, the largest quantity was issued in the shape of money in 1856, when \$29,209,213.24, was coined, this being nearly three times the value of the amount first coined here in 1854, which was \$10,842,281.23. This latter doubled the following year, and, as we have seen, nearly trebled the second year after; but it has never attained anything like these dimensions since, save last year, when it exceeded \$26,000,000 in value. During all the other years it has wavered in value, between about fourteen and nineteen millions of dollars. The greatest quantity of silver coined here was in 1868, when \$822,000 worth was converted into money. And the extent to which gold of California production enters into that minted in the Union, is shown conclusively by the fact, that out of all the gold coined in the United States Mint at Philadelphia, amounting in value to over two hundred and fifty-seven million dollars, not less than two hundred and thirty-one million dollars worth was minted from California gold.

THE PRECIOUS METALS.—The New York Journal of Commerce estimates, on the most reliable returns at its command, the annual yield of gold at about \$55,000,000, and of silver about \$17,000,000, making \$72,000,000 as the annual product of the United States. The total annual yield of the world is about \$210,000,000. The imports of specie and bullion from foreign ports for the year ending June 30, 1872, is put down at \$13,743,886, against \$21,900,024 for the year ending June 30, 1871. The exports of specie and bullion to foreign ports in the fiscal year ending June 30, 1872, were \$93,543,885, against \$79,877,534 in the fiscal year ending June 30, 1871.

Business Cards.

H. C. BENNETT,
STATISTICIAN.
Reports and estimates made about all departments of
Production, Commerce, and Manufacture, of the Pacific
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AMOS BOWMAN,
Mining and Topographical Engineer.
No. 637 Kearny Street, near Olaf. Residence, 17 Rondel
Place (Mission and 16th). sc19

RICHARD H. STRETCH, Civil Engineer,
City and County Surveyor.
Office—Room 16, City Hall. 11v24-3m

GRAY & HAVEN,
ATTORNEYS AND COUNSELORS AT LAW,
in Building of Pacific Insurance Co., N. E. corner Cal
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SCROLL SAWYER,
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And No. 9 Q St., bet. First and Second,
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Manilla Rope of all sizes. Also, Bale Rope and Whale
Line constantly on hand. Tanned Manilla Mining Ropes
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Brass and Steel Stamps and Dies, 608 Sacramento street,
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Diseases of a chronic and obstinate character, especially
such cases as have for years, or a lifetime, resisted
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pre-eminent on the Pacific Coast, as well as throughout
the Union, and by his success has achieved for him-
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Packets, 3d. each; tins, 6d., 1s., 2s., 6d., and 1s. each.
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AND FLOUR.
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by Ironmongers, Grocers, Oilmen, Brushmakers, Drus-
gists, etc. 21v25-1y

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Blind, Bleeding, Itching, or Ulcerated
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Ransome's Patents,

For which Commissioners for the International Exhi-
bition of 1862 awarded the Prize Medal, and Gold
Medal at the Mechanics' Institute Fair, 1871, of San
Francisco.
The Pacific Stone Company call the special attention
of Architects, Engineers and the public in general, to
the SUPERIOR QUALITY of the Stone now being man-
ufactured by them in this city under the Ransome
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Building Fronts, Water Pipes
Sinks, Monuments, Fountains,
Tiles, Copings for Walls,
Filters, etc., etc.,

Together with Ransome's Celebrated Free-Grit Grind-
stones, all of which we guarantee superior, and at a
price far below that of hand-work.

The attention of private parties intending to build is
respectfully solicited.
Office, No. 10 DUSH STREET, San Francisco.

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PATENT APPLIED FOR.

The Great Labor Saver of the Household.

ECONOMY, CONVENIENCE AND SAFETY COMBINED.

JUST THINK OF IT—
No Wood, no Coal, no Coal
Gas, no Stove Pipe, no
Chimney, no Smoke,
no Ashes, no Dirt, no Wood
Boxes, no Coal Scuttles, no
Kindling Wood, but a
Friction Match, and the
Fire in Full Blast in
Half a Minute!
OVEN HOT IN TWO
MINUTES.
Stew boiled in seven
minutes! Baked Beans in
thirty minutes! The fire
extinguished in a moment!
And the house unheated!
It has no rival in all
kinds of Cooking and Heat-
ing. Heating and com-
bines Economy, Conven-
ience, Neatness, Safety and
Durability! The Ladies
Welcome it; a little CHILD
can operate it, and

ALL RECOMMEND IT.
Prices from \$6 to \$25, according to size.
Manufactured and sold by

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The attention of the Medical profession is respect-
fully called to the following preparation of this new reme-
dial agent. Eucalyptus and its preparations have been
found useful in obstinate cases of Intermittent and Marsh
Fever, often supplanting the use of Quinine. The
paroxysms of Asthma and Catarrh are greatly controlled,
and in various Kidney diseases and Catarrh of the Blad-
der it seems to act like a specific.

FLUID EXTRACT EUCALYPTUS.
This extract represents in a concentrated form the
medicinal effects of the leaves of Eucalyptus Globulus.

THE ELIXIR OF EUCALYPTUS.
This compound presents the properties of the leaves
in a palatable form and elegant appearance. Dose—
One tablespoonful, to be repeated as often as the case
demands.

Cigarettes of Eucalyptus Globulus, useful in
Asthma, Difficulty of Breathing, Incipient Pleurisy, etc.
Prepared and sold by JAMES G. STEELE & CO.,
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The public are respectfully cautioned that BETTS'S
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BETTS'S name is upon every Capsule he makes for the lead-
ing Merchants at home and abroad,
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C. W. STRONG & CO.,
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We purchase Ores, Dullion, etc. Ores worked and
Tests made with care. Also, Assays of Gold, Silver,
Copper, Lead, Tin and other Metals. 23v22-1f

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CHEMIST,
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—AND—
Chemical Apparatus,
Having been engaged in furnishing these supplies since
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Our Gold and Silver Tables, showing the value
per ounce 'Troy at different degrees of fineness, and val-
uable tables for computation of assays in Grains a
Grammes, will be sent free upon application.
7v25-1f JOHN TAYLOR & CO.

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Silver-Plated Copper Amalgamating Plates,
for Saving Gold.

Of all sizes and in any quantity, furnished to
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Particular attention given to plating goods for
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To Mill Men and Miners.

I am now manufacturing
CYANIDE OF POTASSIUM,

Which I can sell upon better terms than any other
dealer on the Pacific Coast.
I make three grades or qualities to suit the require-
ments of different consumers.
I will be glad to furnish prices to any person ad-
dressing me on the subject.

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24v25-1f

Varney's Patent Amalgamator.

These Machines Stand Unrivaled.

For rapidly pulverizing and amalgamating ores, they
have no equal. No effort has been, or will be spared
to have them constructed in the most perfect manner
and of the greatest number now in operation, not one has
ever required repairs. The constant and increasing de-
mand for them is sufficient evidence of their merits.
They are constructed so as to apply steam directly
into the pulp, or with steam hotwells, as desired.

This Amalgamator Operates as Follows:
The pulp being filled, the motion of the muller forces
the pulp to the center, where it is drawn down through
the aperture and between the grinding surfaces.
Thence it is thrown to the periphery into the quicksilver.
The curved plates again draw it to the center, where it
passes down, and to the circumference as before. Thus
it is constantly passing a regular flow between the grind-
ing surfaces and into the quicksilver, until the ore is
reduced to an impalpable powder, and the metal amal-
gamated.

Settlers made on the same principle excel all others.
They bring the pulp so constantly and perfectly in con-
tact with quicksilver, that the particles are rapidly and
completely absorbed.
Mill-men are invited to examine these pans and settlers
for themselves, at the office, 229 Fremont Street,
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Richardson & Co., Copper Ore Wharves,
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RICHARDSON & Co. have been for thirty years established
in Swansea as Agents for the preparation, Sampling, Assay-
ing, and Sale of Copper, Silver, Gold, Lead, Zinc, and al-
other Ores and Metals, for which they have extensive Ware-
houses and Wharves under cover, 1,600 feet of Quay Front-
age within the Floating Dock, and the most complete Ma-
chinery and Appliances. They are also prepared to make
advances against Ores in anticipation of realization, and to
guarantee all payments when required. 11v24-1y

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Vessels, Apparatus, Sheet, Wire, Etc., Etc.
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Made from Solid Rock and

"Clear as Crystal."

TRY THEM.

They Have No Equal

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PRACTICAL OPTICIANS,

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BEWARE OF IMITATIONS.

Persons in the country can be suited with the BRA-
ZILLIAN PEBBLE SPECTACLES by forwarding one of
their old glasses in a letter, or, if they have never worn
glasses, they will please state the fact, and age, height,
etc. Ordinary glasses to suit all sights can be procured
in the same manner. 16v4-3m-awhp

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CELEBRATED

Worcestershire Sauce.

Declared by Connois-
seurs to be the only good
SAUCE

Caution Against Fraud.

The success of this most
delicious and unrivalled
Condiment having caused certain dealers to
apply the name of "Worcestershire Sauce"
to their own inferior compounds, the public
is hereby informed that the only way to
secure the genuine is to ask for LEA &
PERRINS' SAUCE, and see that their names
are upon the wrapper, labels, stopper and
bottle.

Some of the foreign markets having been
supplied with a spurious Worcestershire
sauce, upon the wrapper and labels of which the names
of Lea and Perrins have been forged, L. and P. give
notice that they have furnished their correspondents
with power of attorney to take instant proceedings
against manufacturers and vendors of such, or any
other imitations by which their right may be infringed.
Ask for LEA & PERRINS' Sauce, and see name on
wrapper, label, bottle and stopper.
Wholesale and for export by the Proprietors, Worces-
ter; Crosse & Blackwell, London, &c., &c., and by
Grocers and Oilmen universally. 15v24-1f

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MEERSCHAUM MOUNTED WITH SILVER. Meerscham
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Underground Treasures—How and Where

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To prevent infringements, notice is hereby given, that
Betts's name is on every Capsule he makes for the principal mer-
chants in England and France,
thus enabling vendor, purchaser, and consumer not only to
identify the genuineness of the capsule, but likewise
the contents of the vessel to which it is applied.
The LORD CHANCELLOR, in his judgment, said that the
capsules are not used merely for the purpose of the orna-
ment, but that they are serviceable in protecting the wine
from injury, and insuring its genuineness.
MANUFACTURERS—1, WHITE-ROAD, CITY-ROAD, LONDON,
AND BORDEAUX, FRANCE.

OFFICE.....Rooms 11 and 12 Montgomery Block,
SAN FRANCISCO.
25v25-3m,

Mining and Other Companies.

Owing to the space necessary to wait the present large edition of the M. & S. Press we are obliged to go to press on this day's edition—which is the very latest hour we can receive contributions.

Amazon Silver Mining Company—Location
of works, Ely District, Lincoln County, Nevada.
Notice is hereby given, that at a meeting of the Board of Trustees of said Company, held on the twenty-second day of October, 1872, an assessment of ten cents per share was levied upon the capital stock of said Company, payable immediately in United States gold and silver coin, to the Secretary of said Company, at his office, No. 409 California street, San Francisco, Cal. Any stock upon which said assessment shall remain unpaid on the sixth day of January, 1873, shall be deemed delinquent, and will be duly advertised for sale at public auction, and unless payment shall be made before, will be sold on Wednesday, the 25th day of January, 1873, to pay the delinquent assessment, together with costs of advertising and expenses of sale. By order of the Board of Trustees.
M. J. McMANUS, Secretary pro tem.
Office, 609 Sacramento street, San Francisco, Cal.

Amazon Silver Mining Company—POSTPONEMENT.
The delinquent stock on the above mentioned assessment is hereby postponed until Thursday, the 23rd of January, 1873, and the sale thereof until Friday, the fourteenth day of February, 1873. By order of the Board of Trustees.
M. J. McMANUS, Secretary pro tem.

Cordillera Gold and Silver Mining Company—Location
of property, Morelia Mining District, Chihuahua, Mexico.
At a meeting of the Board of Trustees held at the office of the Company, December 21st, 1872, a special assessment of fifteen cents (15 cts.), was levied on each and every share of the capital stock of the Company, payable immediately in United States gold coin, to the Secretary, at his office, corner Market and Spear streets, San Francisco, Cal. Any stock upon which said assessment shall remain unpaid on Tuesday, February 21st, 1873, shall be deemed delinquent, and will be duly advertised for sale at public auction, and unless payment shall be made before, will be sold on Monday, the 19th day of February, 1873, to pay the delinquent assessment, together with the costs of advertising and expenses of sale.
HEARY R. REED, Secretary.
Office, 221 Washington street, San Francisco, Cal. December 24th, 1872.

Gold Run Mining Company—Location
of works, Nevada County, Cal.
Notice is hereby given, that at a meeting of the Board of Trustees of said Company, held on the 30th day of December, 1872, an assessment of ten (10) cents per share was levied upon the capital stock of said Company, payable immediately in United States gold coin, to the Secretary, at his office, corner Market and Spear streets, San Francisco, Cal. Any stock upon which said assessment shall remain unpaid on Tuesday, February 21st, 1873, shall be deemed delinquent, and will be duly advertised for sale at public auction, and unless payment shall be made before, will be sold on Monday, the 19th day of February, 1873, to pay the delinquent assessment, together with the costs of advertising and expenses of sale.
G. C. PALMER, Secretary.
Office, corner Market and Spear streets, S. F. Jan 1st

A Special Meeting of the Stockholders
of the Gold Run Mining Co., for the election of a new Board of Trustees, and for the transaction of such other business as may properly come before the meeting, will be held at the office of the Secretary, corner of Market and Spear streets, on Tuesday, February 4th, at 12 o'clock M. By order of Board of Trustees.
G. C. PALMER, Secretary.
Jan 1st

Great Blue Gravel Range Company—Location
of works, Elko Gravel Range, Placer County, California.

Notice.—There are delinquent upon the following described stock, on account of assessment levied on the 16th day of November, 1872, the several amounts set opposite the names of the respective shareholders as follows:

Names.	No. Certificate.	No. Shares.	Amount.
Babcock, T. J.	145	25	\$2 50
Babcock, T. J.	147	25	2 50
Babcock, T. J.	148	25	2 50
Babcock, T. J.	153	100	10 00
Babcock, T. J.	186	150	15 00
Babcock, T. J.	187	50	5 00
Babcock, T. J.	198	50	5 00
Babcock, T. J.	199	50	5 00
Babcock, T. J.	200	50	5 00
Babcock, T. J.	201	50	5 00
Babcock, T. J.	202	50	5 00
Babcock, T. J.	203	50	5 00
Babcock, T. J.	204	50	5 00
Babcock, T. J.	205	50	5 00
Babcock, T. J.	206	50	5 00
Babcock, T. J.	207	50	5 00
Babcock, T. J.	208	50	5 00
Babcock, T. J.	209	50	5 00
Babcock, T. J.	210	50	5 00
Babcock, T. J.	211	50	5 00
Babcock, T. J.	212	50	5 00
Babcock, T. J.	213	50	5 00
Babcock, T. J.	214	50	5 00
Babcock, T. J.	215	50	5 00
Babcock, T. J.	216	50	5 00
Babcock, T. J.	217	50	5 00
Babcock, T. J.	218	50	5 00
Babcock, T. J.	219	50	5 00
Babcock, T. J.	220	50	5 00
Babcock, T. J.	221	50	5 00
Babcock, T. J.	222	50	5 00
Babcock, T. J.	223	50	5 00
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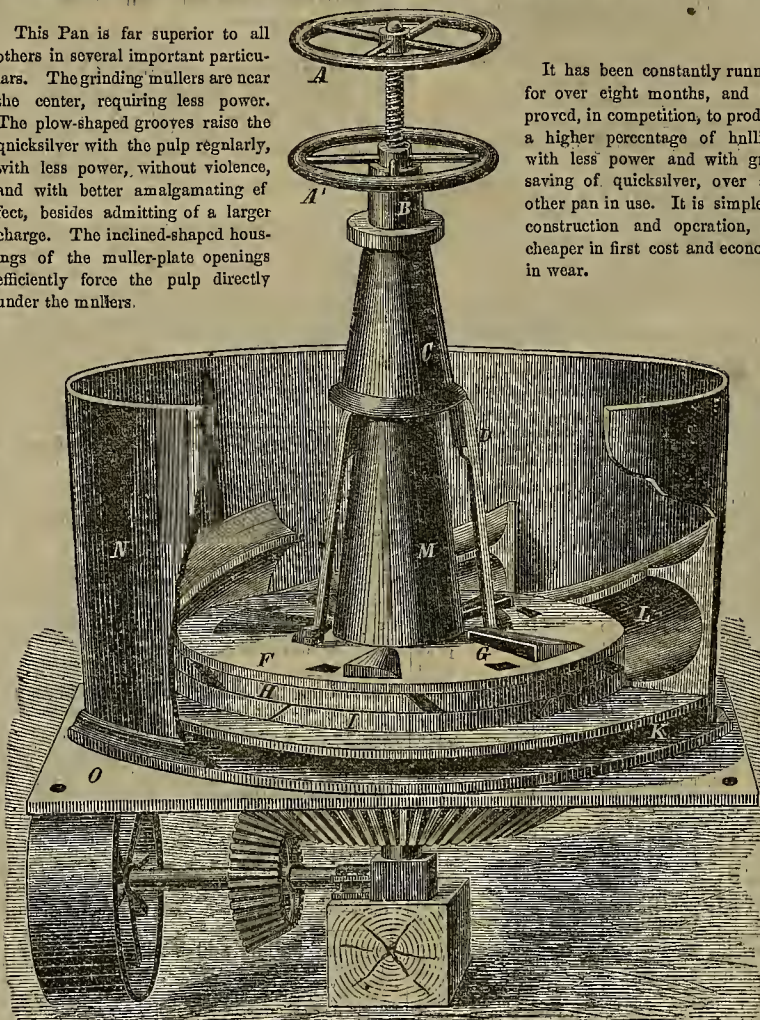
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It has been constantly running for over eight months, and has proved, in competition, to produce a higher percentage of hullion, with less power and with great saving of quicksilver, over any other pan in use. It is simple in construction and operation, and cheaper in first cost and economy in wear.

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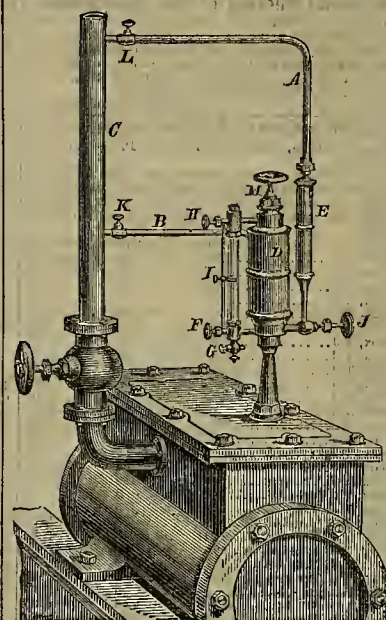
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These Lubricators are acknowledged by all engineers to be superior to any they have ever used; feed constantly by pressure of condensed water, supplied by pipe A, regulated under the oil by valve J, and forced out through check valve and pipe B into the steam pipe C; it then becomes greasy steam, passes to all the valves and cylinder at every stroke of the engine; glass tube I indicates amount used per hour. Packing on rods and stems lasts longer, and the rings on the piston will not corrode. One pint of oil will last from three to six days, according to speed and size of engine; I, sliding gauge; K, valve to shut off when engine stops; H, F, valves to shut off in case of frost; steam does not enter the cup; it is always cool; warranted to give satisfaction. Patented February 14, 1871. Manufactured by California Brass Works, 125 First street, S. F. 24v23ff

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Woodworth Planers a Specialty. 4v25-3mNotice is hereby given, that the copartnership heretofore existing between A. J. Severance, Charles W. Randall and J. Gus. Burt, under the firm name of "Severance, Holt & Co.," is this day dissolved by mutual consent. A. J. Severance, having purchased all the interest of his late partners, will continue the business of manufacturing and selling Diamond Drills as before, under the style of A. J. Severance & Co. Dated San Francisco, Nov. 24, 1871.
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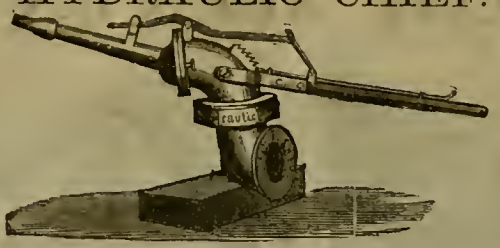
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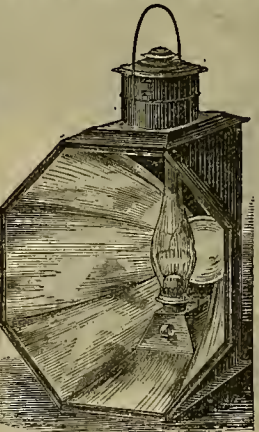
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Sketch of Delaney's New Patent Cushion.



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16v20-8m JOHN F. LOHSE, Secretary.

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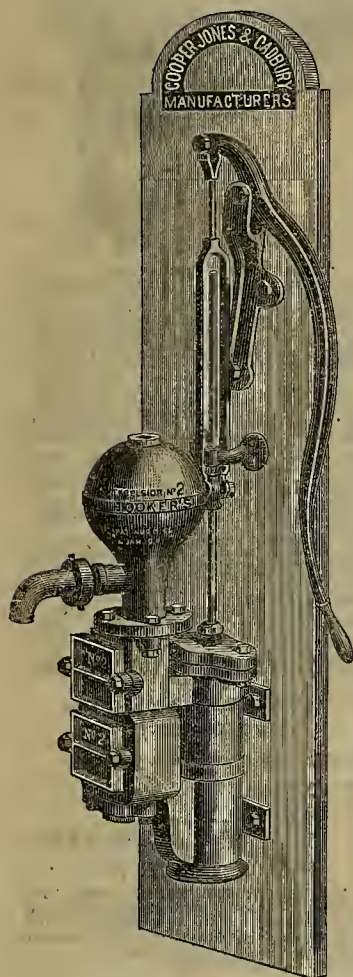
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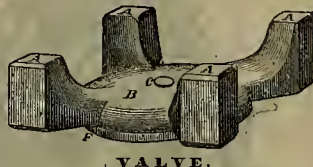
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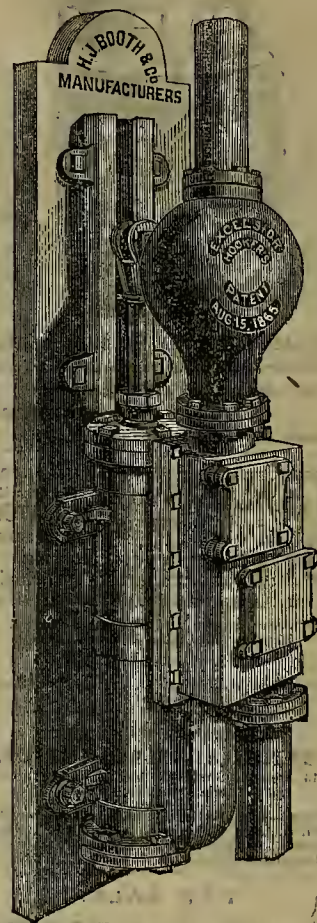
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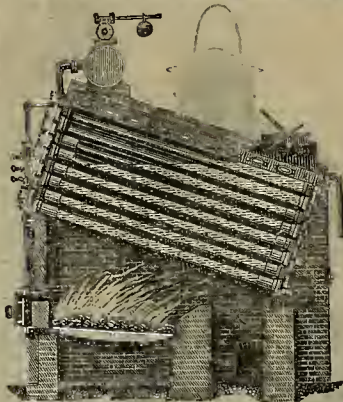
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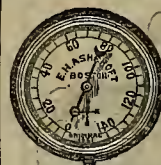
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SAN FRANCISCO, SATURDAY, JANUARY 25, 1873.

VOLUME XXVI.
Number 4.

Belmont Mines and Mills.

Our occasional correspondent, Mr. G. Kustel, well-known as a mining engineer and author of several works on metallurgy, etc., and who left this week for the Vienna Exposition, made a short visit to Belmont, Nevada, last week and sends me a few notes from there. He says that mining enterprise is quite active now in Belmont, owing principally to the successful start of the Monitor-Belmont mill, and to the promised mill operations of the El Dorado mill, which is expected to be in motion in a few weeks. To give a better idea of the situation of the ledges than merely by verbal description, Mr. Kustel encloses me a sketch which we have had engraved, and which, although a free hand drawing, made after a plan by Geo. Ernst for the Monitor-Belmont Company, is sufficiently correct to serve the purpose. The

Monitor Belmont Mines

Has three tunnels, as the map shows. Tunnel number three has been opened quite lately under the superintendence of Mr. W. T. Wright, to the length of 500 feet, at which distance the ledge was struck. From tunnel No. 1 to No. 3 is 185 feet on the vein, or 112 feet perpendicular depth. There are no hoisting works at the mine, all the ore being carried out by way of the tunnels at present. There is a great deal of so-called "virgin ground" of wet chloride ore, to be taken out from above tunnel No. 1 down to tunnel No. 3. From this mine about 520 tons were shipped to the Manhattan mill, in Austin, yielding nearly \$500 per ton on an average. During my presence at Ellsworth, to the mill in this place also 30 tons were shipped from the Monitor, of the above richness. At present, having their own mill near by, there is no necessity of selecting high grade ore, neither is it of any advantage to beneficiate very rich ore. The vein continues downwards from the lowest level from two to four feet wide, probably with an increase of rich sulphurets (all sulphurets in the vein being rich).

This Mill

Belonging to the Monitor-Belmont Co., under the superintendency of Mr. MacMasters, has twenty stamps, seven pans, five settlers and a Stetefeldt roasting furnace. All machinery works perfect. The battery transmits the pulverized ore by elevators and conveyers to the furnace, or such chloride ores as do not require roasting, directly to the hoppers near the pans. The mill runs on two hundred dollar ore at

present, turning out very fine bullion, in shape of about 1,500-ounce bricks. I have been allowed to select very interesting specimens for the Vienna World's Exposition, from this and also from other mines; and, by the way, to tell the truth, I could collect here in the mines in a few days more valuable specimens for the Exposition than I could with the San Francisco people in five weeks, even with the assistance of all the meetings and speeches. The

Belmont Mine

Is now 280 feet deep on the incline. There is also very good ore in the mine. The fault that occurs in this ledge, that is, the pure mineral,

Coin.—The number of \$20 pieces coined at the Mint in this city during 1872, amounted to \$15,600,000, and all the gold coinage was \$16,000,000; the silver coined was \$380,000. The Bulletin publishes a table of the total coinage of the mint for the past ten years including 1872, of both silver and gold, and the whole amount is \$184,308,180. In this connection it may be stated that the deposits in the mints of the United States since their foundation to the present year, have aggregated the enormous sum of \$836,205,463, of which more than \$730,000,000 was the product of our own gold

Important Mining Suit.

Overman vs. Dardanelles is the title of a new suit commenced on the 18th, in the District Court of this County, as the Territorial Enterprise, which promises to possess great interest to the mining community. The controversy is to decide the ownership of twelve hundred feet of the extension southward of the ore body now being worked in the Crown Point and Belcher mines, and which, it is expected, will be found in the neighborhood of the Overman new shaft.

The Dardanelles Company having applied for a United States patent for 1,200 feet of ground lying west of the Overman new shaft, the latter Company are obliged to protect in the Land

Office, and to bring this suit to quiet title. The only question arising in the case is whether the ledge worked in the Overman old shaft, and which continues southward from that point toward American Flat, and the eastern ore body which appears to run in the direction of Devil's Gate, are one or two ledges. If one ledge, it belongs to the Overman by virtue of prior location; if two ledges, the western or American Flat ledge belongs to the Overman, and the eastern or Belcher continuation is the property of the Dardanelles.

In the working from the Overman old shaft no ore has been found at a greater depth than 400 feet, and in the Overman new shaft, some 2,000 feet east of the old one, a depth equivalent to about

1,100 feet has been attained and the ledge is not yet reached. In order, therefore, to show that there is but one ledge, it will be necessary to trace a connection between the two ore-bodies through a vertical distance of some 600 feet and a horizontal distance of about 2,000 feet.

Many well informed miners believe that this cannot be done. As the estimated value of the property in controversy runs up to millions, it is easy to see why the case possesses more than ordinary interest. Messrs. Williams & Bixler are the counsel for the Overman Company, and we understand that John Garber, James A. Hardy and Harry I. Thornton have been retained by the Dardanelles.

HOME INDUSTRY.—The Mission and Pacific Woolen Mills have added another branch to their business, by undertaking the manufacture of Ingrain carpets. Their mills have attained such a reputation both at home and abroad by their superior products that there is no doubt but that the carpets will be as good if not better than those made in the East.

PLACERS IN MONTANA.—Montana with her extensive placer mines yielded last year according to Wells, Fargo & Co's statement, the handsome sum of \$4,442,135. Now we hear of the discovery of new and promising placer mines on the left fork of Little Deep Creek, in Meagher county.



SURFACE-GROUND PLAN OF BELMONT MINES.

pays \$3,700 per ton. There is a big pile of ore near the hoisting works, waiting for a chance to be worked in the Monitor mill. The light yellow lead ore, very frequent in the ore, is quite interesting but always heavily charged with chloride of silver. The El Dorado mine I had no time to visit, but there is also a great deal of rich ore waiting for the mill. I received for the Vienna Exposition some most interesting and rich ore from

Jefferson Canon

Of the "Prussian" ledge. It is a contact vein between slate and porphyry. I did not see the mine, but give it as I hear from others. There are about 1,500 pounds of this ore here; all looks alike and uniform. The specimen I received shows \$10,700 in silver and \$2,019 in gold, together \$12,719 per ton. The peculiarity of this ore is, that it is a conglomerate of very fine, about one-eighth of an inch long but very perfect quartz crystals, chloride and sulphurets of silver and telluride of gold; this latter occurs also in a vein in the neighborhood of the "Prussian," called "Sailor Boy's Ledge." It is said the vein is from six to twelve inches wide, but certainly not all pay twelve thousand dollars per ton.

SUTRO TUNNEL.—Very rich float rock has recently been found on the line of the Sutro Tunnel which averages up into the thousands.

and silver bearing States and Territories, within the last 24 years.

ARTIFICIAL MARBLE.—The Manhattan Marble Company, whose works are located in Oakland, turned out their first piece of work last week. The artificial marble they produce is susceptible of a fine polish and may be made in any color. This is the third company manufacturing artificial stone in this State. In this connection it may be stated that a fine quarry of variegated marble has recently been discovered in lower California, which is pronounced equal to any foreign article.

JAPANESE PROGRESS.—An industrial fair and exhibition is to be held in the city of Kioto, in Japan, in March, and a number of San Francisco manufacturers are about to forward articles to that place. In view of the increasing trade with the Orient our artisans and manufacturers should take advantage of every opportunity to show their wares, and get the business orders before Eastern agents are able to do so.

MORE QUICKSILVER.—A rich vein of cinabar is reported as having been found on the Arroyo Grande, San Luis Obispo County. This branch of mining promises to be prosecuted over a wider range in this State than heretofore.

CORRESPONDENCE.

Placer County Mines.

Promiss of a Good Water Season—Yield of Old Claims at Forest Hill.

[Written for the Press.]

So far, the present has proved one of the best winters for water we have ever had in this neighborhood; the rain, though a little tardy, having been copious, and falling at such a steady but moderate rate, and at such intervals as produced the greatest possible amount of good. Should the balance of the season bring the additional quantity usual, the ditches will be kept in good supply till a late period next summer, insuring for the mining interest a great prosperity the coming year.

As is generally well known, we have at this place one of the most prolific of our old river channels, Forest Hill having been for many years one of the most

Productive Mining Districts

In the State—it being estimated that within half a mile of the town as much as twelve or fourteen million dollars have been taken out. Commencing in '51, the district during the next ten years saw its most prosperous days, beginning to decline about the time of the Fraser River excitement. Prior to this many of the drift claims here had yielded enormous quantities of gold. The Dardanelle, for example, had turned out \$2,000,000; the Jenny Lind, over a million; the New Jersey, \$850,000; the Deidesheimer, \$650,000; the Independence, \$450,000; the East and Norwood, the Rough and Ready, the Gore, the Snyder and the Maine, each \$250,000; and many other claims from \$50,000 to \$200,000 each; and yet, owing to the careless and even reckless manner in which these claims were worked,—causing extensive caves, whereby much of the best ground was covered up,—but few of them were more than partially exhausted, while fully one-half of the gold contained in the gravel was lost through the imperfect modes adopted in washing and working it. Many exceedingly rich spots were met with in this channel. The New Jersey Company took out \$850,000 from an area 500 ft. long by 400 wide; the Gore, \$250,000 from a space 100 by 200 feet; the Independence, \$10,000 from an area of 20 feet square, and the Snyder \$40,000 from a basin only 380 feet in diameter, with many other noteworthy examples of success.

Relocation of Old Claims.

But all this occurred at a time when the miner expected to make large wages, when they did not well understand how this sort of work should be done, and when the methods for saving the gold were wasteful and defective, wherefore, having worked out the richer and more accessible portions of their claims, they were easily lured away by the discoveries that from time to time elsewhere occurred during the next ten or twelve years. Latterly many of these men have been returning to their old places of resort, and we now find them looking about for means to put these once forsaken claims in working shape, or for parties to buy them, for it is found that a number of them must be aggregated and worked under one ownership, by which plan alone they can be operated with profit. As this requires time and capital not much has yet been accomplished in this neighborhood. Nevertheless, we have here the properties for many large and successful operations, and have already made a beginning. Last summer a number of San Francisco capitalists commenced the business of securing titles to some of the best claims here, with a view to consolidating them and working them on a large scale. In a few instances this has already been effected, though in most of these cases there has occurred such delay, through the difficulty encountered in securing so many different titles, that it will require some months yet to consummate the business. It being evident, however, that the old plan of working these claims will no longer do, there is little question but more of these proposed enterprises will be carried out the coming summer, and something of its former prosperity be restored to this long neglected neighborhood. Of the few already organized and under way, the most promising is that of

The Great Blue Gravel Range or Powsil Co. Now operating on this channel a few miles below here at Todd's Valley. To this place the old river bed is clearly traced, not only by unmistakable surface indications but also by several rich claims opened up at various intermediate points along it, the first of these being the once famous Dardanelle ground, one mile below here, and another the Spring Garden ranch, half way between that and the Powell claim. This latter covers an area of great extent, nearly two miles of the old channel lying within its boundaries. The largest of the old company's claims in this vicinity, even from which so much gold was taken, were small compared with this. The Dardanelle had a frontage of 1,000 feet; the New Jersey 650 feet; and the Jenny Lind 450 feet; while the Gore claim had barely 100. But the running of an expensive tunnel to open each of

these small claims when it should have served for working a large extent of ground was the great mistake of the early day, and one that is now happily being avoided through the system of aggregation before mentioned.

The plan of utilizing such of these old tunnels as had been run on unsuitable levels is also, coming more into vogue. Where found too low for convenient working, or too high for drainage the practice of raising a shaft to the stratum of pay gravel in the first case, or sinking an incline in the other, is now very often adopted; recourse to these, especially where there is not a large amount of lifting to be done, being found more economical than the construction of a new tunnel. As affording means for prospecting grounds, and sometimes also for permanent working purposes, this mode of procedure is often advisable.

In the exploration of the Powell claim it has with good judgment been adopted. A tunnel was here carried in some years ago for a distance of 750 feet, at which point the old river channel was reached, but on a level too high to afford drainage. From the inner extremity of this tunnel an incline shaft was sunk on the vein rock to a depth of fifty or sixty feet, when the water so increased that the company, being without machinery for pumping, were compelled to suspend work.

Pay Dirt at Last.

Lately operations on this claim have been resumed, but instead of starting a new tunnel on a lower grade an extensive chamber has been excavated at the head of this incline, 750 feet in from the mouth of the tunnel, in which an engine, with boiler and pumping gear, all new and powerful, have been placed; a shaft having been carried over a hundred feet to the surface to answer the purpose of a chimney. The incline having been sunk a further distance of 60 feet, is now below the heavy river boulders that immediately overlie the stratum of auriferous gravel in this old channel, and there can be no doubt but the company will soon be taking out rich pay dirt at this point.

Owing to the unexpected depth of the channel here they have been delayed in reaching its bottom; but this having now been so nearly accomplished the owners are likely to reap a rich harvest as the reward of their perseverance and patience. OLD MINER.

Gravel Mining in Shasta County.

Fifteen or twenty years ago the section of Shasta county drained by Clear creek, Dry creek, Eagle creek and Cottonwood, says a correspondent of the *Bulletin*, was alive with eager prospectors and miners, and the classic names of Horsetown, Muletown, Piety Hill, Roaring river, and other mining camps equally euphonic in name were familiar as household words. Lately these have been almost forgotten; a few meek-eyed Israelites, "Heathen Chinee," and scattering veterans from the great army of '49 constituting their entire population. But a combination of circumstances now at work seems likely to drag these places from their long oblivion, and place them prominently before the public as remarkable fields for mining enterprise. Until the Central Pacific and Oregon railroads gave access to this remarkable district, it was almost inaccessible, and a trip here could be made only by way of Oroville, and at a great expenditure of comfort, time and money; to this is mainly attributable the small progress made in developing the mines here.

At the Minns.

Fifteen miles from Cottonwood station the evidences that you have reached a mining country are rudely thrust upon you. In the ravines and on the flats lie unsightly heaps of tailings and rock—old sluice-boxes, torn-up soil and all the wreck and ruin wrought by placer-mining show the work of devastation. Standing here on the main ridge, you see the two principal water-courses of the district—Dry creek and Clear creek. These run towards the Sacramento, divided from each other at this point by a sharp gravel ridge, several hundred feet high and about three-quarters of a mile in width. A considerable body of water runs all the year round in Clear creek, and its banks and bars have been mined for miles up and down, and several prominent residents of the State—among others, Major Redding—are credited with having made their "raise" here. Dry creek, on the other hand, carries water but a few months in the year. In this creek, whenever water and the season admitted of it, surface-mining was carried on to a considerable extent, and it ranked high in the category of "grub diggings." But a few years ago a miner more enterprising than the others, determined to sink a shaft to bed-rock in the creek during the dry season. After sinking some sixty or seventy feet, water drove him out, but his labor proved the existence of a bed of blue gravel carrying water-worn boulders, and yielding handsome prospects all the way down. On the strength of this discovery, by purchase and otherwise, he effected a consolidation of claims along the head of the creek for a length of three miles, and a width of half a mile, making in all a property of 1,800 acres. This, in connection with a water-ditch, he brought before the notice of some San Francisco capitalists, who purchased the mine and

formed a company to develop it under the name of the

Dry Creek Tunnel Company.

The parties chiefly interested are Messrs. B. G. Lathrop, F. D. Atherton, John Skinner, J. W. Brown, and one or two others. These gentlemen have spent two years time and upwards of \$50,000 in developing, and persons accustomed to the lavish expenditures for such purposes in Nevada and Placer counties, would be surprised at the amount of work accomplished for the outlay. In opening this mine so that the most recent hydraulic improvements might be applied to its working, the difficulty was to secure a tail-race. Dry creek was flat and afforded none; but a survey established the fact that the bed of Clear creek was several hundred feet below that of Dry creek. Here was a solution of the difficulty. A tunnel and deep cutting from creek to creek was made. It is 3,600 feet in length, and has occupied two years' time in construction, and used over 200,000 feet of lumber. As this was the first enterprise of the kind in the district, the owners had many unforeseen difficulties to contend with. They had to build houses, shops and sawmills, and employed a small army of blacksmiths, carpenters, miners and teamsters. This tunnel is a remarkable piece of engineering. It terminates at a point near the center of the company's claim, 100 feet below the surface of the ground. The company at present have only a limited supply of water, but have already surveyed a ditch which will afford them about 2,000 inches all the year round. The surface-gravel, being the debris from the surrounding hills, which are auriferous, is rich, paying an average of fifty cents per cubic yard. The blue gravel underlying the upper strata yields fully as well. A partial clean-up of the sluices will be made some time during this month. Leaving this company's claim and keeping along the ridge about a mile further, we reach the claim of the

Piety Hill Gravel Mining Company.

Here another hydraulic operation on a large scale is being carried on. This company is also composed of San Francisco men, who have invested a large amount of money in the purchase and development of their claims. They own a gravel-bed 300 acres in extent, and averaging fifty feet in depth. The deposit has no tenuous or clayey superstratum, but consists of a mass of auriferous red and blue gravel, deposited in regular layers, and yielding more or less gold from top to bottom. The bed-rock is in a hard metamorphic state. A large amount of work has been done on this claim. Prospective tunnels have been run hundreds of feet in almost every direction, and upwards of forty shafts have been sunk to bed-rock, exposing, in every instance, the same quality of gravel. A tail-race, 1,500 feet in length, has been cut through hard, blasting rock, in some places fifteen and twenty feet deep, at a cost of over \$25,000. Twenty-three miles of ditches supply 800 inches of water during the greater part of the year. During the coming season the claim will be worked to its full capacity. As yet only patent tests have been made as to how it will pay. On the north side of the main flume a washing of 50,000 cubic yards yielded \$9,000, or an average of eighteen cents per cubic yard, on the west side 2,000 cubic yards gave \$741.25, or an average of thirty-seven cents per cubic yard. The company are using two of Craig's "Little Giant" hydraulic machines, either of which will throw 400 inches of water under a pressure head of 100 feet.

The Silver Minns.

Several years ago some excitement arose regarding quartz discoveries in Shasta county, but it soon died out. The ore was refractory. The necessary machinery was expensive and almost unobtainable at that time. The knowledge how to work such rock was limited, and sundry other causes united to bar further progress. A change is coming over these things. The ledges are situated in a chain of rugged mountains, already referred to. West of Piety Hill, the ledges crop out boldly in granite near its junction with slate formations. They are numerous and well-defined. The gangue is quartz, and the pay-ore blackish sulphurets of silver, carrying also a small quantity of gold. The ores are base and require roasting before yielding their treasures. In ascending the hill, the first vein of any consequence is the Crystal. This shows for half a mile by croppings. A shaft eighty feet deep has been sunk upon it. Rock ten feet from the surface only assayed a few dollars, but from the bottom of the shaft gave \$360. Several tests were made from other parts of the vein equally satisfactory.

This claim was recently purchased by San Francisco parties, and a contract has just been let for the extraction of one hundred tons of ore. It is the intention of the owners to sack the ore and ship it to San Francisco for the present. Further up the hill lies the "Cincinnati." Some little work has been done on this vein at a point where it has been crossed by a mountain stream. Enough was extracted to give a fair working test. It paid \$200 per ton. Still further up the mountain lies the "Chicago." A small five-stamp mill and furnace are at work on this vein. On account of limited facilities for working, the rock extracted is selected with scrupulous care, and only such as pays \$400 and \$500 per ton is worked. In this vein, on the hanging wall, is found a thin seam of ruby silver, red as blood and very beautiful. Considerable work has been done on other veins, notably the Red Chief, on the dump of which there lies one hundred tons of ore waiting shipment, which will pay \$60 per ton without assorting. With this excellent showing,

within twelve hours of San Francisco, better than half the "new" districts in the sagebrush and desert, will it be believed that there is not a single mill of any account in the county? Many of the mines have no owners and are open to location, while others can at the present time be bought on most favorable terms. Here is an opportunity for investment at our door, and one that can be looked at in person at a small outlay of time and money.

Silver Bullion and Coin.

We have heretofore, on several occasions, remarked upon the increasing silver production of this coast, says the *Alta*, and at the same time the lessening demand for it in the markets of the world, leading to the project of coining a dollar which might find free use in China commerce. In the very full, able and exhaustive report of Dr. H. R. Linderman, on the Branch Mints of the Pacific coast we have most interesting facts in relation to bullion and its coinage, particularly in relation to large coinage of fractional silver in San Francisco last year, and which was stopped in March, and in relation to the proposed commercial dollar. So long, however, as Great Britain coins gold free and the United States charges one-half of one per cent., the coining value of gold in London will be higher than it is here. Several illustrations are presented confirmatory of this fact. The price of silver bullion varies at our several Mints. At Carson \$1.21 is the price per standard ounce, while at Philadelphia and at New York it is \$1.22½. The San Francisco Branch is not now purchasing. The average price at the British Mint during the past year was \$1.22.55 per ounce of the British standard of 925 thousandths, equal to \$1.19.2 per ounce of U. S. standard (900 fine), or 2½ per cent. premium on the par value of the silver dollar. The last London quotation was 60d, equal to 1½ per cent. premium only. One and three-fourths per cent. premium on our standard would give \$1.18 39 per ounce. Two per cent. would give \$1.18 68 per ounce. Two and a half per cent. would give \$1.19 26 per ounce. Four per cent. would give \$21 per ounce. It is evident we are paying above the market rate for silver, and the report advises that the subject of reducing the Mint price receive consideration of the Department, fixing the price at some specific sum per ounce, and not an assumed premium upon the intrinsic value of an ounce as now. When the Mint bill passes there will be no silver dollar of account upon which to reckon the value of silver bullion or the premium. If the silver is to be paid for in gold, as formerly, the price should not be fixed at over \$1.18½ per standard ounce, which would be nearly 2 per cent. premium; but if it is to be paid for in silver coins it might be fixed at \$1.20 per ounce. Having concluded his examination of the Branch Mints the Doctor refers to several practical questions of collateral interest connected with the production of the precious metals and the system of exchanges to which they give rise. The amount of silver bullion annually produced from the mines of the United States is increasing and now amounts to about twenty millions per annum, exclusive of the gold it contains, thus rendering the future value of silver as compared with gold a matter of national importance. The fluctuations in the relative value of gold and silver during the last hundred years have not been very great, but several causes are now at work, all tending to an excess of supply over demand for silver, and its consequent depreciation. Among these causes may be stated the increasing production, its demonetization by the German empire and by Japan, and its continued disuse in this country, the effect of which will be to bring to the market as bullion large amounts hitherto used as coin. Even if silver should be adopted by Germany for subsidiary coinage, not more than \$50,000,000 will be required for that purpose, which will leave \$300,000,000, or about 9,000 tons, to be disposed of as bullion, a market for which can only be found in such of the European States as maintain the single standard of silver, or the double standard of gold and silver, and in China and the Indies. These facts indicate the gradual adoption of the gold standard. The true policy of this country, therefore, is to seek a market in China for its silver bullion, and to do this it must be put in form to meet a favorable reception there—it must be appreciated. Had the United States dollar equalled in fine silver the old Spanish dollar, as was originally intended, it would no doubt long since have become an important agent of commerce. He thinks the silver dollar, being a useless coin, both as respects circulation and commerce, should be abolished, and a new one made which will meet certain commercial requirements, and recommends, to meet the California trade, a new coin, or disk, which shall be slightly more valuable than the Mexican dollar, to be made only upon the request of the owner of the bullion, and to be paid for by him, and not legal tender, but simply a stamped ingot with its weight and fineness indicated. If this new coin should be accepted in our trade with China, it would supersede the Mexican dollar, and probably command a premium of 6 or 8 per cent. The product of our silver mines is now exported at an average discount of at least 2 per cent. Dr. Linderman's suggestion, if followed, will be of advantage not only to our commerce but also to our mining industries. As this new coin would also be a most desirable form for use in the arts, it would most probably put a stop to the melting of our silver coins.

MECHANICAL PROGRESS.

The Limit of Cylinder Pressure.

Some facts of a special character were adduced at a late meeting of one of the British Societies, in support of a somewhat singular opinion—that the limit of advantage in the use of high pressure in expansion was reached at about 40 lb. per square inch, and that any increase of pressure beyond that was useless, and therefore, for various obvious reasons, disadvantageous. The statements made did not appear either clear or conclusive, and were not endorsed by the meeting. It was admitted that about 60 lb. pressure was the present practical limit employed, but no very distinct reason was assigned for stopping there, except that the makers had found by experience what they could do with that pressure, and felt safe in its use. In reply, it was urged by the author of the paper that this “finality” view as to the limits of pressure having been reached had no clear foundation, and in illustration some lengthy experts were read by him from the evidence of Donkin, Farey, Field, Taylor, and others, before a parliamentary committee in 1871, when the same sort of “finality” view then in the mouths of those engineers, affirmed that 4 lb. to 7 lb. per square inch was the utmost limit of pressure that should or could safely ever be used on board a ship. These quotations may have had the *ad captandam* merit of raising a laugh from the younger men present, but I cannot avoid questioning the good taste with which opinions, uttered fifty years ago—taken somewhat out of their surrounding—were made to throw ridicule upon some of the greatest mechanics of their day, whose real accuracy of thought and knowledge the proceedings quoted from most clearly show. It was pointed out by more than one speaker that the double-cylinder engine contained elements admitting of the boiler pressure being pushed further than with the single-cylinder engine, and it was stated by an eminent Liverpool maker that 60 lb. pressure was not deemed the limit of pressure, either theoretically or practically.—*The Engineer.*

Horseshoes.

The earliest horseshoe makers appear to have been Vandals and German tribes, in the graves of some of whom they have been found. They seem to have been totally unknown to the ancients. The first mention of them in literature is in the works of the Byzantine Emperor Leo, about a thousand years ago, by the name of “selenia”—half moons, or crescents. They are thus among the most modern of our everyday appliances. Before Leo’s time, cavalry horses were often disabled by the wearing out of their hoofs. The war horses mentioned by Job and other Scriptural writers were unshod. Receipts were given by Xenophon, Vegetius, and other writers, for hardening the hoof. The Japanese have for centuries used straw socks or shoes for the feet of horses traveling on stony roads. They wear out quickly but cost almost nothing, and can easily be repaired.

Horse shoeing was probably introduced into England by William the Conqueror. Henry de Ferrer (or Ferrers), who came with him, had six horseshoes quartered in his coat of arms, and is believed to have been superintendent of farriers.

The superstition which attributed a power over evil spirits to horseshoes, and which at one time prevailed so largely that most of the houses in the west of London had them nailed over the entrances, yet lingers. In many houses of the more ignorant classes in several countries they may be still be seen thus displayed.

It was reserved for an American, Henry Burden, of Troy, to contrive machinery whereby this most useful article could be prepared by machinery instead of by the tedious and laborious hand process that all nations up to the middle of this century employed.

SOLDERING IRON AND STEEL.—Dr. Sieburger publishes the following methods for soldering iron and steel: If large and thick pieces of iron and steel are to be joined, sheet copper or brass is placed between the perfectly clean surfaces to be united, which are then tightly wired together. The joint is covered with wet clay free from sand, and dried slowly near the fire. When the mud is dry the joint is heated by a blast to a white heat and cooled suddenly if iron, slowly, if steel. When brass is used, it requires less heat, of course, than copper. For objects of a moderate size hard brass solder is made by fusing together eight parts of brass and one part tin. Soft brass solder is composed of six parts brass, one part zinc, and one part tin. For soldering small iron or steel articles a hard silver solder composed of equal parts of fine silver and malleable brass is used, the mass being protected by borax. Soft silver solder differs from this only in the addition of 1-16 part tin. Very fine and delicate articles are soldered either with pure gold or a gold solder composed of one part gold, two parts silver, and three parts copper.

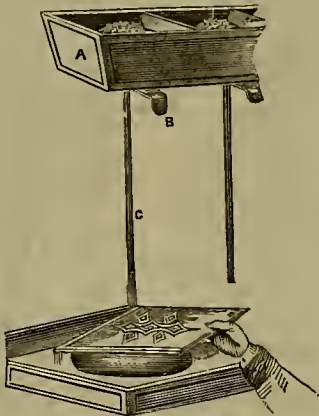
The Sand Blast.

The interest in the sand blast seems to be constantly increasing, as the sphere of its usefulness becomes more and more extended. Since the original patent was obtained by Mr. Tilligman in Oct. 1870, numerous devices have been patented on various contrivances for applying it to practical uses.

We give herewith a representation of one of the most simple ones, which is shown in operation upon an engraver’s table. A pattern or stencil has been prepared and placed upon the plate to be engraved, the plate being moved about on the “cushion” the exposed portions thereof are cut away by the falling sand, while that intended to stand in relief is protected from wear by the pattern.

Sometimes the tube, which conveys the blast is made flexible, in which case the stream of sand is guided over a fixed surface. The article to be engraved may be a silver cup, a watch case, a goblet or other articles. The sand consists of a mixture of corundum and emery. It is simply placed in a hopper a few feet overhead, and as fast as it runs down may be replaced in the hopper by hand. All the work, after the pattern is placed upon the article to be engraved, may be done by boys or girls.

A current of steam is sometimes introduced into the sand tube, which drives it with great



ENGRAVING BY THE SAND BLAST.

force for cutting rock, etc. With 100 lb pressure of steam, and a supply equal to 1½ horse power the cutting effect is found to be about 1½ in. of granite, 4 in. of marble, or 10 in. of soft sandstone per minute. The sand is introduced by a central tube of ½ in. bore, the steam issuing from an annular passage surrounding the sand tube.

An Important Application
Of the blast has been lately directed upon a block of brittle pitch or resin, on which a picture has been produced by photography, in gelatine, or drawn by hand in oil or gum. The bare surface of the resin is quickly cut away, leaving that portion covered by gelatine undisturbed. The material may be so cut away to a depth, which will allow of its being used as a matrix for an electrotpe, which can then be printed from an ordinary letter press. The lines left in relief will be well supported, their base being broader than their top, and there being no under cutting, as occurs in zincography, where the etching is done by acid.

The variety of uses to which the sand blast may be applied is constantly multiplying.

LUBRICATION WITHOUT FATTY MATTER.—It has been a long time the practice, with horologists to use graphite as a reducer of friction, in even the most delicate pieces of mechanism. In blowing engines, also, if the gearing is copper, graphite is the only lubrication used. These facts have led to the simple experiment of ascertaining the effect of a mixture of graphite—prepared by decantation—and hog’s lard, first in the stuffing-box of a pumping engine, and subsequently upon a steam engine. The result proved to be very satisfactory in the case, the only especial care requisite being to keep up the necessary quantity of graphite in the mixture, as otherwise it becomes too fluid. In another experiment, in which a paste of graphite and water was employed, the result proved equally effective; the slight escape of steam into the stuffing-box was sufficient to keep the graphite in a moist condition, and the lubrication seemed quite perfect, although there was no fatty matter present.

TINNING BY ELECTRICITY.—A new and important process of “tinning” by electricity has been brought into successful operation in Birmingham. By this process any metal, it appears, but zinc, can be coated with a very white metal of great brilliancy, of which tin forms the principal element. The precipitation is effected as in the electrotpe process. It is the intention of the company to tin in this way plates of iron and steel, and to use it as the layer upon which silver may be deposited, so that in ornamental articles, if the silver wear off, a pure white surface shall be still presented to the eye.

SCIENTIFIC PROGRESS.

Ozone and its Preparations.

Among the late developments of science and chemistry is the production of oxygen in a highly electro-negative state, in such quantities and form as to make it an article of commerce, to be used for refining and disinfecting purposes. In each case it is found far superior to chlorine, as used in the form of chloride of lime, as generally applied; the lime contributes but a small portion of the effect which it is desirable to produce, and it is used mainly on account of its affinity for chlorine, which makes it a good vehicle for carrying and maintaining the gas of chlorine, obtained from a mixture of sulphuric or muriatic acid and manganese, and it is entirely impracticable to make an article of commerce of chlorine on account of its powerful effect upon vessels, which might be made to contain it, of ordinary materials.

The apparatus used to manufacture it must be made of lead, and it will even oxidize them in a short time to such an extent as to destroy them, unless they are frequently cleansed or amalgamated with mercury. So that chlorine is an almost impractical agent for disinfection purposes, or for the treatment of oils, varnishes, etc., which are at first heavily charged with offensive and deleterious odors, and gases, except in the form of chloride of lime, and that, besides being an inconvenient form, foms an apparatus, and is not one time in ten, reliable in its strength. A substitute, therefore, for chlorine, which is available at all times in a simple form, and which is reliable in its action, is a very valuable agent, and this substitute is found in ozone.

As before stated, ozone is oxygen in a highly electro-negative state, and is produced by passing electric discharges through air and through oxygen. Houzeau’s plan of manufacture is the use of a narrow delivery tube, upon the interior of which is fixed a thread of copper, lead or platinum, one of the ends of which is passed out through a lateral orifice in the upper part of the tube, which orifice is closed with wax. Another thread of the same metal is rolled around the exterior of this tube, and the two threads are put in connection with an electric coil which gives off sparks two or three centimeters long, and immediately the oxygen of the air is converted into ozone. This agent can therefore be produced upon the premises, in manufactories or residences, with a cheap apparatus and at a small cost, and the air which is so strongly vitiated at times as to foster epidemics, can be completely sweetened and vitalized.

There are other means beside the one we have described, equally as simple, for ozonizing the oxygen of the air, as the principle is susceptible of several applications. Patents have recently been issued for an apparatus, and parties have engaged in its manufacture, at Washington, which apparatus it is intended to furnish for the use of private residences, manufactories, or towns and cities. It is expected that it can be applied the same as gas is furnished, in pipes, and at so trifling an expense that it will prove a luxury as cheap almost as air on the mountains. This is a step in science which cannot be valued too highly.—*Am. Manufacturer.*

NEW THEORY OF THE AURORA BOREALIS.—A German philosopher, Dr. Wolfort, has put forth a novel theory, claiming that the beautiful and seemingly erratic phenomena of the Northern Lights are due, not to electricity, but to reflected sunlight. The Doctor says: “The earth being conceived as a large mirror, many of the oblique incident rays will be reflected to a part of the celestial vault which is visible to the night side of the earth. The zodiacal light, an incomplete luminous ellipse, appearing in tropical skies before sunrise and after sunset, is probably thus formed; an irregular reflection of sunlight from water. Similarly, in case of the Northern Lights, the vast fields of ice in polar regions may be regarded as an imperfect mirror irregularly reflecting the incident light.” The new theory does not seem to meet with much favor among scientists for various reasons, among which it has been mentioned that the irregularity of the occurrence of the Aurora precludes the hypothesis of a cause regular in its action. Neither the great reflecting mirror—that is the icefields—changes materially from day to day, or even from month to month; nor does the sun’s light perceptibly vary. How is it, then, that Aurorae occur at exceedingly irregular intervals, and that a display of exceptional brilliancy is occasionally simultaneously observed over a whole hemisphere or nearly so? Another objection is the peculiar lustrous character of the display which so frequently inspires the admiration of the beholder, and is entirely inconsistent with the supposition of a reflector acting upon the sky its light borrowed from a constant and unvarying source. It is impossible, thus, reasonably, to explain the flickering, rapidly shifting forms and varying colors of the Aurora Borealis. Nothing in any way analogous has ever been elsewhere observed in reflected light. Besides, the points of the heavens at which the auroral forms sometimes show and group themselves, are impossible to any theory of reflected sunlight.

A New Idea in Wine Manufacture.

Dr. E. W. Sylvester, of New York, read a very interesting and suggestive paper before the American Institute Farmers’ Club on the 24th ult., wherein he endeavored to show the existence of an entirely new principle in the manufacture of wine—that the substance which we call alcohol is not produced by fermentation, but only by the *after process* of distillation. In other words that no alcohol, whatever, exists in pure, fermented wine until it is placed there by mixing therewith the products of distillation. He calls the fluid produced by the fermentative action of sugar on the juice of the grape, “fermentine” and we suppose, by purity of reasoning, the rule holds good in the fermentive changes of all other saccharine liquids. This fermentine becomes alcohol only on the application of heat sufficient to produce evaporation. Natural temperature, when high enough to cause a somewhat active evaporation, is sufficient to effect the change when in vessels not entirely filled. It is essentially different from alcohol in its effects on the human system and upon various substances in nature.

The Doctor compared the relative actions of fermentine and alcohol to the moderate eating of cloves, which only acts as a gentle stimulant, while the oil which may be obtained from the same quantity of cloves by distillation would produce almost instant death. The change takes place in the act of distillation—changing a harmless stimulant to a deadly poison. This gentle stimulating principle in cloves cannot be separated by any means now known to chemists. When it is sought for, it is converted into an entirely different substance, as is known from its effects. So it is with fermentine, which has never yet been seen pure and unmixed. But confidence is expressed that since the existence of the principle is now known and recognized, chemistry will eventually be able to isolate it.

It is well known to chemists that the same combination of elements does not always lead to the same results. Common illuminating gas, when pure, is identical with the oil of roses; yet it does not require a chemist to distinguish the flavor of the one from the other.

Fermentine, as taken moderately in pure wine, gently and healthfully excites the system, and has the power to restore the victim of a burning fever to natural action and vigorous health; while alcohol spends its whole force on the nervous system—breaking down and shattering instead of building up. Hence the Doctor concludes that no wines should be used which have had alcohol added to their bulk.

DETERMINATION OF SEX.—Professor Agassiz, who has given more new ideas, and furnished more food for the mind, more practical knowledge to the people of “these United States,” and all served up in the choicest and most interesting and easily-understood words and sentences; than any other man in the same years, recently made an address before the Am. Institute Farmers’ Club at New York, in which he said he would confine himself to one branch only, which should be the various functions connected with breeding. He startled his hearers by declaring that the time would come, though far in the future, when sex would be regulated and determined before birth. There were but two classes, the oviparous and viviparous, and in both cases the germ sprang from an egg, though in the latter the young were brought forth alive. His illustrations and delineations on the blackboard of the egg in the process of incubation were not less interesting than the developing changes in its incipient stages, previous to its becoming a germ. An egg is a live being struggling into its development, he said. The world needed observers.

FORMATION OF CLOUDS.—An English writer while criticising somewhat unfavorably Professor Poe’s new classification of clouds, remarks that in his opinion there are but three ways in which it is possible for clouds to be formed. These are, first, the cooling of a mass of air *in situ*, by radiation; this forms *stratus*. Second, the cooling of a mass of air by diminished pressure, when it flows in an ascending column; this forms *cumulus*. A modification of the process is when sudden expansion takes place above, so as to diminish the pressure through the entire height of the column of air, and, in consequence of the cold due to the diminution of pressure, produces condensation of vapor throughout the column. This is Eep’y’s explanation of water spouts. Third, the cooling of the mass of air by coming into contact with a cooler mass of air than itself; this forms *cirrus*.

AN ACCURATE ESTIMATE.—A curious illustration of the power of scientific prediction even on subjects by no means of a mathematical kind, has just been afforded us. In the memoirs of the Museum of Practical Geology, “Mineral statistics of the United Kingdom of Great Britain and Ireland, for the year 1871,” just published by Robert Hunt, Keeper of Mining Records, the consumption of coal, in 1871, is stated at 117,352,028 tons. In Professor Stanley Jevon’s book on *The Coal Question*, published more than seven years ago, he estimates the probable consumption of coal in Great Britain, for 1871, at 117,300,000 tons.—*London Spectator.*

OUR MINING SHAREHOLDERS' DIRECTORY.

ASSESSMENTS.									
Name of Co.	Location.	Secretary.	S. F. Office.	Assmt.	Levied.	Delinq't.	Sale.		
Adams Hill Con. M. Co.	Eureka Dist.	W. W. Traylor.	414 California St.	26	Dec. 23	Jan. 24	Feb. 14		
AMAZON S. M. CO.	Ely District.	M. J. McManus.	409 Sacramento St.	10	Oct. 22	Jan. 23	Feb. 14		
Amelia S. M. Co.	Ely District.	W. H. Knapton.	414 California St.	10	Jan. 3	Feb. 8	Mar. 1		
Arden Coal & M. Co.	Ely District.	J. H. B. Plegiate.	729 Montgomery St.	10	Jan. 3	Feb. 8	Mar. 1		
Buckeye G. & S. M. Co.	Washoe.	J. Maguire.	419 California St.	1	Jan. 21	Feb. 25	Mar. 18		
BUNKER HILL C. M. CO.	Washoe.	Charles H. Knox.	pro tem. 19 First St.	10	Dec. 3	Jan. 6	Mar. 27		
California Flat South Ex. M. Co.	Cal.	T. E. Webster.		10	Dec. 27	Jan. 28	Mar. 27		
Chapman M. & M. Co.	Cal.	F. Swift.	415 Montgomery St.	23	Dec. 27	Jan. 28	Mar. 27		
Chief of the Hill M. Co.	Ely District.	C. S. Neal.	402 Montgomery Street.	50	Jan. 15	Feb. 20	Mar. 14		
Con. Virginia M. Co.	Wreboe.	T. D. Bagley.	401 California St.	3	Dec. 16	Jan. 20	Feb. 13		
CORNER & S. M. CO.	Cal.	W. H. Reed.	414 California St.	10	Jan. 21	Feb. 25	Mar. 18		
DuPon M. Co.	Butte Co., Cal.	C. F. Balcom.	426 Montgomery St.	40	Jan. 8	Feb. 17	Mar. 8		
EAGLE C. M. Co.	Santa Barbara Co.	Wm. H. Watson.	302 Montgomery St.	50	Jan. 18	Mar. 19	Mar. 2		
Empire M. Co.	Idaho.	C. F. Balcom.	426 Montgomery St.	1	Jan. 6	Feb. 16	Mar. 1		
Esmeralda Coal & M. Co.	Washoe.	G. H. Watson.	329 California St.	1	Jan. 21	Feb. 25	Mar. 18		
Equitable T. & M. Co.	Utah.	C. S. Healy.	Merchants' Exchange.	10	Jan. 22	Feb. 22	Mar. 10		
Esta Buena Con. S. M. Co.	Nevada.	A. Noel.	419 California St.	23	Dec. 16	Jan. 17	Feb. 12		
Globe M. Co.	Idaho.	W. H. Dean.	419 California St.	10	Jan. 7	Feb. 12	Mar. 19		
Gold Run M. Co.	Nevada Co., Cal.	L. Kaplan.	Merchants' Exchange.	2	Dec. 26	Jan. 26	Feb. 12		
Green Valley Blue G. Co.	Cal.	C. C. Palmer.	Market and Spear Sts.	10	Dec. 30	Feb. 4	Feb. 25		
Hale & Norcross S. M. Co.	Cal.	A. D. Carpenter.	Noroba to Ex.	25	Dec. 12	Jan. 11	Feb. 8		
Horn Gravel M. Co.	Idaho.	F. E. Wagner.	413 California St.	5	Dec. 12	Jan. 15	Feb. 8		
IVANHOE S. M. CO.	Ely District.	L. Kaplan.	Merchants' Exchange.	50	Jan. 17	Feb. 10	Mar. 10		
Jewett G. & S. M. Co.	Washoe.	Daniel Buck.	331 Montgomery St.	10	Dec. 12	Jan. 19	Feb. 9		
Johnston & S. M. Co.	Washoe.	J. M. Brimington.	Merchants' Ex.	5	Dec. 13	Jan. 17	Feb. 3		
Junia Coal & M. Co.	Santa Luis Co., Nev.	C. S. Neal.	305 California St.	5	Dec. 13	Jan. 17	Feb. 3		
Justice M. Co.	Washoe.	C. S. Neal.	402 Montgomery St.	53	Jan. 17	Feb. 24	Mar. 17		
Kentuck M. Co.	Washoe.	R. Wegener.	414 California St.	10	Dec. 11	Jan. 14	Feb. 4		
Kentucky & S. M. Co.	Ely District.	F. Swift.	415 Montgomery St.	10	Dec. 12	Jan. 15	Feb. 4		
Lady Emma M. Co.	Utah.	F. E. Wagner.	369 California St.	10	Dec. 12	Jan. 15	Feb. 4		
Lady Euter & T. & M. Co.	Ely District.	A. D. Carpenter.	Merchants' Ex.	25	Dec. 12	Jan. 11	Feb. 3		
La Paz M. Co.	Idaho.	C. S. Healy.	Merchants' Ex.	5	Jan. 13	Feb. 13	Mar. 1		
Land & Gravel Cariboo M. Co.	British Col.	B. B. Minor.	411 1/2 California St.	50	Jan. 20	Feb. 28	Mar. 25		
Magnolia S. M. Co.	Eureka Dist.	L. Kaplan.	Merchants' Ex.	10	Dec. 17	Jan. 22	Feb. 10		
McDonald M. Co.	Schell Creek.	G. R. Spilney.	320 California St.	23	Jan. 9	Feb. 13	Mar. 10		
Marion S. M. Co.	Ely District.	L. Kaplan.	Merchants' Ex.	25	Jan. 9	Feb. 16	Feb. 5		
MEDLEY & WEALEY EAST EX. CO.	Idaho.	T. W. Osburn.	419 California St.	1	Jan. 16	Feb. 21	Mar. 18		
Minnesota G. & S. M. Co.	Idaho.	Wm. Willis.	419 California St.	1	Jan. 20	Feb. 21	Mar. 18		
MOCKINGBIRD M. CO.	Nevada.	W. O. Kibbe.	419 Cal. St.	10	Dec. 5	Jan. 10	Jan. 31		
MOHAVE CON. G. & S. M. CO.	Idaho.	T. J. McNeil.	607 Montgomery St.						

sals for the purchase of another well-known mine in this district.

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BRACKETT & Co.—This mine is across the gulch, opposite Duryea's, and has yielded a vast amount of the shining ore. The Co. after 5 years' steady labor, have worked out the lower portion of their claim and are now engaged in running a new tunnel higher up the ridge. They have worked out about 1,000 ft. in length of the channel, and fully as much more remains to be mined through the new tunnel. They have driven a distance of 160 ft. in solid ledge, and an additional hundred will take them through to gravel.

SIMPSON & Co.—Their claim is situated a short distance up the gulch. The main dume—34 ft. in length, 23 inches in the clear on the bottom and 28 on the top—is the handsomest piece of work of that kind ever put into a mine in this vicinity. They also have a branch dume 120 ft. long, similarly constructed. These gentlemen intend using 300 inches of water which will have a pressure of 230 ft. The bank is 80 ft. in height.

MOSEY, HARRINGTON & Co.—Their claim is located a short distance above Simpson's. The proprietors, are uncovering one of the best paying mines in the county. A vast amount of water is used in sweeping the debris away down the gulch, fully 2,000 inches being employed.

PERCIVAL, WALTERS & Co.—This claim is at the head of Spring Gulch, and is being got into splendid shape for working to advantage. They have a fine bank of gravel 50 ft. high, easily washed, and containing gold from top to bottom. They have 5 and 6 inch iron pipe, with a fall of 76 ft. 120 inches of water are used. The Co. have just laid down a new dume—16 inches wide on the bottom and 20 on the top—with a grade of 11 inches to the box.

WOLFEHNE.—This mine is developing into one of the best mines in the State. The main shaft has reached a depth of about 200 ft., uncovering a ledge over 4 ft. in thickness. The quartz taken out is unprecedentedly rich and improving in quality. Ore obtained in sinking this week appears to be masses of gold and sulphurates. Good judges estimate that the rock during the past week will average \$350 per ton—with a width of over 4 ft. The five stamp battery on the mine is kept constantly in operation.

WEST POINT DISTRICT.—The unexpected strike of rich ore in one of the tunnels of the Lone Star, alluded to last week, has widened to 6 ft. Coarse, free gold, can be seen in generous quantities, on the face of the tunnel.—Judge Beeler's mine shows ore worth \$90 per ton.—Griggs & Co. are dumping some very healthy ore, at Camp Espirito. The hoisting works of the Ohio Cons. are rapidly approaching completion—Jose de Vella & Co. are working a good sized vein, near the North Fork, with excellent results.

GWIN.—Thirty-six stamps are now in operation, yielding an average of \$1,000 per day. The rock in the 500 and 600-ft. levels is high grade and improving as work progresses.

CAMPO SECO.—Calaveras Citizen, Jan. 18: The Sim's claim is still progressing—they are tunnelling, to strike the lead, and will soon commence sinking the old shaft, which is on the lead and known to be rich. The Spencer mine is down 100 ft., in sinking, the shaft was put down straight, leaving the lead some 10 ft. to the east—drifting to strike the vein and will have a good thing when they do, as the rock was rich on top.

SCOFFIELD.—The shaft is down 112 ft., and the rock richer than ever.

ROSE HILL.—This mine, belonging to Mr. Rhodocini, near El Dorado, has commenced crushing again. Ten stamps are running.

KERN COUNTY.

PI UTE.—Havilah Miner, Jan. 11: Mr. O. M. Cummings has been the lucky discoverer of half a dozen ledges in as many months, some of which, upon being developed, have proven to be very rich. The Goldsmith Maid is a large vein; a cut has been run 12 ft. across it without having found either wall. Maria Louise is located a quarter of a mile from the Goldsmith Maid, prospects very rich and is a large ledge. The Oneida Chief is 5 ft. thick and some of the rock prospects as high as \$150 per ton. These mines are all located in this vicinity of the Bright Star mine, which is one of the richest in the county.

MILLS.—Jan. 18: The mills at Kernville, Sageland, Pi Ute and Havilah are running night and day, and more would start up if we had miners to get out the quartz.

The Joe Walker mill will commence crushing rock taken from the Cumberland, in a few days. This mine is a quarter of a mile from the Joe Walker, the rock is very rich, and there is plenty of it.

DISCOVERY.—Paul Pledger has discovered a very rich quartz lead just south of the McKeadey mine. The ledge has been stripped for over 300 ft. on the surface, and is from 1 to 4 ft. in width; the rock prospects, on an average, \$80 per ton. There are over 1,000 tons of ore in sight.

NEVADA COUNTY.

PICATUNE.—Grass Valley Union, Jan. 15: We learn that William Combs & Co. have struck good pay in their claims at Randolph Flat. To reach the gravel bed they commenced operations at Lone Rock Cañon, and run an open cut 800 ft. long and 8 to 10 ft. deep, then excavated the cut to the width of 30 ft. and to the depth of 10 to 12 ft., for a dump; then run a timbered cut 125 ft. in length and 12 to 20 ft. deep, at which point they commenced their tunnel through the run of the basin to a chute in depth 50 ft. under the surface; then continued

the tunnel 550 ft through and under ground, at which point they struck good pay. At about 450 ft. from the mouth of the tunnel a drift 90 ft. long and 8 ft. wide was run easterly in gravel, which yielded a profit over labor in running of \$275. A second drift, near the end of their tunnel, was run easterly 90 ft. in length and 15 in width, the profits over expenses in running which was \$325. They have also run a middle drift between the two above mentioned to work a block of ground which is estimated will pay at least \$1,500, and which can be worked at an outlay of \$450. In addition to the drifts easterly, a drift 40 feet long has been run westerly from the tunnel, and in neither of the drifts has the end of the gravel been reached.

MINING ITEMS.—Jan. 17: We understand that the North Star has struck rich rock in the new shaft. The ledge in the new shaft is from 10 to 12 inches in thickness and shows well in free gold and sulphurates.

IRON.—Yesterday a party of gentlemen left this place for the purpose of getting samples of iron ore from at large ledge. The ledge, it is said, will yield about 70 per cent. of iron.

DAMS OF GOLD.—Jan. 21: The Idaho cleaned up, last Saturday, gold to the value of \$22,000, after a run of 6 days. The preceding 6 days run of the same mill gave \$19,950. The batteries of the mill were not cleaned up in either case, but only the amalgamators were skinned. Twelve days skimming from 35 stamps, worth \$41,950 make a good showing.

The Empire cleaned up after 10 days run with 20 stamps, gold worth \$6,500.

The Europa with 10 stamps for 6 days, cleaned up about \$10,000. The clean up was from the amalgamators.

Daisy Hill is having gold pounded out of ore which judges of the article say will not yield less than \$50 a ton.

The Slate Ledge Co. (Perrins') is crushing a run of 30 loads of rock and the plate of the mill, after 4 days run, have been cleaned up. The plates gave gold worth \$1,500.

LANZANIA.—Nevada Transcript, Jan. 26: This Company having completed their powder drift of 80 ft., and run their T of 49 ft. each way from the head of the drift, yesterday afternoon let off a blast of 6,250 pounds of powder, or 250 kegs. The ground was shattered and broken up for a considerable distance, and millions of tons of gravel were broken up. Monday next a thousand inches of water is to be turned loose into this gravel bank, under a pressure of over 200 ft.

GOLD TUNNEL MINE.—This mine, situated just below town, which during the past 20 years has seen its ups and downs, has, for the last 18 months been under the charge of Harvey Helm, who has worked for the purpose of finding, a regular, well defined paying ledge. After a large outlay of money, in the purchase of machinery, labor, tools, etc., the prospect up to within the past week was anything but encouraging. He has at last been successful, having encountered a large, well defined ledge, from 4 to 5 ft. thick.

PLACER COUNTY.

CRATER HILL.—Placer Herald, Jan. 18: During the past week the Crater Hill quartz mine was sold to the St. Patrick Mill and Mining Co. for \$10,400. The mine is located about one-half mile northwest of the St. Patrick mill, some 3 miles west of here, in the Ophir mining district. It was worked some years ago, and though it was done in a very careless and slovenly manner, and in an old, rickety water mill, there was assayed from it here, in Auburn, something near \$40,000 in 14 months. The claim embraces 600 ft. each on three parallel ledges, making 1,800 ft. in all.

SIERRA COUNTY.

NEW YORK.—Downville Messenger, Jan. 18: The recent rain furnishing water for washing up the drift dirt which has been accumulating in the dump-house, and the yield is about \$10 per day per man.

DIVIDENDS.—The Bald Mountain Co., of Forest City, recently declared a dividend of \$1,000 per share, and this from their first clean up. The Kate Hardy Quartz Co. of Forest City have declared their first dividend.

TUOLUMNE COUNTY.

FORTUNATO CONSOLIDATED MINING CO.—Tuolumne Independent, Jan. 13: This Co. will at once commence operations on the mine which has been in their corporation, located on the 3 miles east of Columbia. The first "Mina Ore" is located near the Jones & Woodman mine. The "Buena Ventura" is on the trail to Italian Bar, parallel with and from 300 to 500 ft. from the "Mina Verda," and prospects well. The "Guardian" is near and southwest from the "Mina Verda." The Co. will contract to sink shafts to the depth of 150 ft. on each vein, and will expend some \$15,000 in prospecting the ledges.

ITEMS.—The Quartz Mountain mines are again in full blast. The Kincaid Flat Tunnel is reported to be completed, or nearly so. Mining has commenced at Columbia and vicinity with plenty of water. J. Gillis & Co. have bonded their valuable mines at Jackass Hill, to a S. F. Co. The water is being fast pumped out of the Sausky mine, in preparation for the employment of 100 men.

Nevada.

ELY DISTRICT.

ALPS.—Pioche Record, Jan. 11: This mine has been yielding admirably of late. Already this month bullion has been produced from it to the amount of \$43,364.75. The last shipment made last Friday morning, and it amounted to \$6,443.13. From 5 to 8 tons of high-grade ore is being brought up daily. The vein from which it is taken is irregular in width, never falling below 18 inches, and not unfrequently widening to 32. The east drift is greatly improving, while the west maintains its average richness.

THE WINE.—The wine that was sunk from the 100 ft. station has now reached a depth of 60 ft. The ledge shows 2 ft. in width, and the ore is of a free, rich character. The base metal that first presented itself in the mine has entirely disappeared.

CRESCENT.—This mine, one of the oldest locations in Ely District, is situated east of the American Flag, and about 200 ft. west of the Sunbeam. The shaft is inclined and has a depth of 75 ft. A streak of mineral and ledge matter has shown about a foot in width to the present depth, and is gradually widening.

SILVER PEAK.—The incline is now down 155 ft. We were shown the assayer's certificate of ore from the bottom of the incline, which retorted \$188.50 to the ton; it was an assay, however, of selected rock.

THE WINE OF THE HILL.—The aggregate shipments from this mine, during the months of Oct., Nov. and Dec., have been something over \$45,000. The main shaft is now 50 ft. below the Burke tunnel, and drifts are being run both ways. There is about 50 tons of ore at the dump, and from 4 to 5 tons is being hoisted daily. Battery assays return an average of \$145 to the ton, and about 60 per cent. of which is realized in bullion.

TAMAMIA.—The incline is now down 70 ft., at which depth the vein is from 10 to 14 inches wide, and the ore is low-grade. The walls are regular, and thickly covered with "stickensides."

PEAVINE.—The main shaft is now 200 ft. in depth, at which point rock having metalliferous has been struck. The mine started in through it. The ore for the last 20 ft. has been very rich, but the vein is very narrow.

GRAY & BISHOP.—The Co. are running a drift northerly from the 250-ft. level, and have drifted 30 ft. through ledge matter without striking the hanging wall.

PIOCHE.—All is activity below, about 5 tons of ore are being hoisted daily, which is being constantly freighted to the Magnet Mill. There are now about 125 tons ahead of the hill, all classed as high-grade ore.

PIOCHE WEST.—Work has been resumed on this mine. Prospects fair. Main shaft 300 ft. deep.

FLORAL MILL.—The foundation for the drying kiln is being constructed, and preparations are being made for the raising of the heavy sleet iron smoke stack. The stamps, pans, settlers, engine, boilers, etc., are all placed in position, and the heaviest and most expensive work has been completed. Some 600 tons of ore are already at the mill ready for treatment; 600 cords of wood on the ground, and a large tank, filled with water, being supplied with the same through pipes from a spring in the mountain not far distant.

STANBARD.—Jan. 10: This mine is located between the American Flag and the Sunbeam. On Monday a vein 4 ft. wide was struck, from which ore assaying from \$200 to \$381 per ton was taken.

HUMBOLDT.

BOLIVIA DISTRICT.—Silver State, Jan. 18: We understand that 4 mining companies have commenced operations. The copper ore of that locality are said to contain a higher percentage of metal than any before discovered in the State. Rich silver ores have recently been discovered in the vicinity of the copper mines.

EMERY.—The owners of the Emery ledge report a two-foot vein of excellent ore in the bottom of the shaft. They have 40 tons of ore on the dump, some of which they are assaying for shipment to the Humboldt Reduction works, or San Francisco.

BULLION.—The amount of bullion shipped from Arizona through W. F. & Co., since our last issue, was \$8,245; and from the Henning, \$800.

Humboldt Register, Jan. 18: There were nearly \$5,000 worth of fine bullion shipped from Humboldt Canal Reduction works at this place, last week.

REESE RIVER.

S. C. BAKER.—Reese River Revue, Jan. 18: The ledge is 15 inches thick and the ore is estimated to be worth \$2,000 per ton.

BEACON.—Monitor Co., Still stopping above the main tunnel level. The fine breast of black metal still holds its own as the work goes on; also taking splendid ore from the lower stops.

EL DORADO SOUTH CON.—The immense ore deposit lately discovered in the south incline 200 ft. south of the hoisting works seems to be the greatest discovery of rich ore ever made in this section. The wall has been followed some 15 ft. from the top of the ore, now measures over 15 ft. and the walls still widening. The ore in this body is pure chloride and horn silver, and the rich heavy flakes seen from wall to wall astonish all who have examined this wonderful deposit. There is ore enough in sight in this body as far as opened into, to turn the company's mill steadily for 12 months.

COMBINATION CO.—The lessees of this Co.'s ground have just finished assaying up the ore extracted under their lease. They estimate to have about 30 tons of first-class ore which will yield \$400 per ton, and about 300 tons of second-class ore which will yield \$200 per ton. The ore is piled up, awaiting an opportunity for reduction in our mills here, but there seems little hope of the mills here being able to do custom work while they have so much work of their own on hand.

WASHOE.

PROSPECTING.—Gold Hill News, Jan. 14: Five or six miles east of Virginia, scattered over the hills on either side of the mouth of Six-mile canon, can be found many pieces of float quartz extremely rich in both silver and gold. A number of men are now engaged in collecting together this float for the purpose of having it crushed, and at the same time find its source, if possible.

DISCOVERY.—Jan. 14: Fourteen miles in an easterly direction from Virginia City, in the eastern foothills of the Washoe range of mountains, near the eastern line of Storey county, is situated what is known as the Golden Eagle Mining Co.'s claim. About four weeks ago, they had stripped the ledge 12 ft. in length, and the sink hole, and what is left, seen from the side, exposing the full face of the ledge to that depth, which, to all appearances, showed a fine deposit of good ore. From the hole sunk samples of ore assayed from \$23 to \$162 per ton, mostly in silver. On the 1st of January the ledge in the shaft at a depth of 30 ft. had increased to 5 ft. in width, and three assays of the ore gave from \$4.93 to \$93.30 per ton, mostly silver.

RICK ORG FOUNTAIN.—Jan. 17: A gentleman to-day exhibited in Virginia some very rich float rock, found somewhere on the line of the Sutro Tunnel. It is gold-bearing quartz, and an abundance of the precious stuff is visible to the naked eye. The specimens of "float" found thus far assay from \$400 to \$1,000.

LOCAL CLAIMS.—The quartz of a number of claims have been located on the range in which the float rock, mentioned by us a day or two since, is found. A gentleman who has been on the ground informs us that the same character of float as that found on the original location occurs along the foot-hills bordering on the valley of the Carson for a distance of two miles. Boulders of quartz several tons in weight are found, which show fine gold, and what is left, seen from the side, exposing the full face of the ledge to that depth, which, to all appearances, showed a fine deposit of good ore. The first locators are about to commence operations looking to the discovery of the ore in place. They will begin by running a deep cut or trench back into the hill, starting at a point where the float disappears under the debris from the face of the hill.

BELCHER.—Daily yield 330 tons, from the 1000 and 1100-ft. levels, both of which producing sections never looked better. The 1200-ft. level is looking finely. The main drift south, at this level, is now in 254 ft. The winze from the 1100 to the 1200-ft. level, 200 ft. south of the Crown Point line, is fully completed and in excellent ore all the way. The main incline is now down 40 ft. below the 1200 ft. level. The main drift east from the incline, at the 1000-ft. level is in 305 ft., at the drift, and the 850 ft. level is in 115 ft. at the drift.

CROWN POINT.—Daily yield about 400 tons, from the 1100, 1200 and 1300-ft. levels. Last Tuesday night, one shift of men, trying to see what they could do, sent up 360 car loads in six hours and a half from the 1100 ft. level—about a car-load a minute—each load of ore weighing 1200 lbs. The powerful hoisting facilities and double cage arrangements of the mine enabled them to do this, being the first time that line ever before performed on the Comstock. The ore-dumps are full. The connection between the north and south drifts at the 1300-ft. level being fully completed, that level is now cool and comfortable as any other level in the mine, and it is opened through from the incline to within 15 ft. level of the Belcher line. The 1300 ft. level will evidently prove to be the best in the mine. Assays from it average about \$175 to the ton. The cross-cut east is in 115 ft., still in fair ore, with no indication of east wall. The main incline is now about down to the 1400-ft. level.

CALEDONIA.—The main north drift on the 400-ft. level of the new works is still driven directly ahead, having passed through the 350 ft. level, and is now at the 150 ft. level, apparently leaving the principal body of ore at this point to the left. The main drift south on the 400 ft.-level of the new shaft is making good progress.

CHOLLAR POTOMI.—Daily yield 120 tons of ore, the assay value of which is \$32 per ton! The body of ore recently opened by the northwest drift at the first station is yielding finely, and prospecting drifts at the 750 and 850 ft. stations making good headway.

GOULD & CURRY.—The incline is down 120 ft. below the 1600-ft. level, making fair progress, though the rock in the bottom is very hard and requires continual blasting.

HALE & NORCROSS.—The station at the 1700-ft. level is opened, and two chutes, one for the ore and the other for waste, are being fast approaching completion. The chutes are being constructed on a much-improved plan, by beginning some 150 ft. away from the shaft, and opening a large incline to the shaft, capable of holding, if necessary, several hundred tons of ore at a time, easing much of the bother and trouble often occasioned by the old and narrow-contracted style. The engine-wince from the north drift to the 1700-ft. level is in 115 ft. at the 1700 ft. level. A new feature, and one that appears to work well and be a great saving of both time and ex-

pense, has been introduced, viz.: that of establishing a blower to be run by a small steam engine on the 1600-ft. level of the mine, thus entirely doing away with the expense and power necessary to force the air down to that level.

KNICKERBOCKER.—Operations still confined to the gloaming of the old workings about the 500 and 600-ft. levels.

OVERMAN.—Notwithstanding the steady and continued operation of both the pump and water tanks, the work of draining the shaft is making slow progress. Over 50,000 gallons of water per hour is being hoisted, with strong indications of the supply slowly though gradually weakening.

SAVAGE.—Daily yield over 145 tons of ore worth \$23 per ton. The incline, the main south drift on the 1,600-ft. level and the main drift north to connect with the south drift from the Gould & Curry are making good progress.

VIRGINIA CONS.—The shaft is down 130 ft. below the 500-ft. level, the rock in the bottom continuing to work well. The main north drift on the 1,167-ft. level from the Gould & Curry shaft, is still driven ahead.

YELLOW JACKET.—The lowest or 1,300-ft. level being drained of water, drifting east for the ledge is resumed from the incline. This drift is now in about 100 ft. At the 1,400 ft. level the east drift is nearly 100 ft. into the ledge matter, but the face is in barren quartz and periphery. The Comstock lode is over 300 ft. wide at this level. Drifting north and cross-cutting east at the 1,300-ft. level.

ARIZONA AND UTAH.—The heavy body of water tapped in the shaft during the fore part of the week has caused an entire suspension of that part of the work at present. A drift at the 250-ft. level to connect with another at the same level from the Globe tunnel has just been commenced.

JULIA.—Cutting out for a new station, at the 1,000-ft. level, is making good progress. The main east drift on the 800-ft. level, is in 403 ft. the face still in low grade ore.

KNICKERBOCKER.—The main west drift is in 500 ft. the face being in a mixture of quartz and porphyry.

INSURANCE.—The incline is down 105 ft. below the tunnel level, the rock in the bottom working quite hard.

BALTIMORE CONS.—A very favorable, yet not unexpected change has taken place in the prospects of the mine during the past week. The drift for the ledge, at the 250-ft. level, is in 240 ft.; it passed through clay. Yesterday it cut through this clay wall into ledge matter, being a mixture of quartz and clay, from which came a strong flow of water, which taxed the pumping and hoisting facilities of the company to the utmost at first, but it is fast subsiding. Some of the quartz from the face of the drift gives good assays, encouraging the hope that a good body of ore may be near by.

BUCKEYE.—This mine is turning out about 30 tons of ore per day, the assay value of which is nearly \$20 per ton, keeping both mills of the company steadily running. The ore stops, both south and north of the incline are looking splendidly.

SILVER HILL.—The shaft is down 105 ft. below the first station, the entire shaft in quartz and low grade ore. A new station at this point is being opened as rapidly as the necessary timbers can be procured. The main south drift is still driven ahead the face in good ore. The main drift north is pressed ahead to strike the chimney of ore found in the old upper workings.

UNION CONS.—The northeast drift on the east side of the ledge, is in 57 ft., the face still in low grade ore.

Utah.

SATURN FURNACE.—Salt Lake Tribune, Jan. 10: Situated at Sandy Station, is making a very successful run with 2 cupolas, turning out iron from 10 to 12 tons of bullion daily.

SPRINGTOWN DIS.—SILVER KING.—This mine is situated 12 miles northeast of this town. There is a tunnel a distance of 125 ft. following the ledge. At a point 100 ft. from the mouth of the tunnel, there is a shaft sunk to the depth of 97 ft. that runs in mineral, though the ledge appears to be broken in places. At the bottom of this shaft there is another tunnel run 65 ft., and a shaft sunk from the back end to the depth of 65 ft. The character of the ore is galena, carbonate and is 25 in silver to the ton, and yields 40 per cent. lead.

GRAND CROES.—The tunnel is in a distance of 183 ft. and from thence there is an incline shaft sunk 55 ft. deep. From the bottom of this incline a tunnel is run westerly 50 ft. There can be seen a well formed ledge 32 inches thick, encased between two walls, perfect in appearance. I am told by one of the owners of this mine that the ore is worth \$50 in silver to the ton, and that it carries 55 per cent. lead. Character of ore is mostly galena, though mixed with carbonate.

DEFANCE.—Tunnel in 75 ft. and passes through the location made by the I. X. L. company. From the back end of this tunnel there is an incline sunk to the depth of 30 ft., which shows about 1 ft. of galena and carbonate. I am told, I am told, \$30 in silver to the ton, and carries 50 per cent. of lead.

MUSCATINE.—Situated 2 miles to the southeast of this town. The incline shaft in this mine is down 35 ft. and shows 3 ft. of ore, the character of which is mostly carbonate with some galena mixed. I am told by some of the owners that this ore is worth \$50 to the ton in silver and carries 60 per cent. of lead.

GREAT BASIN.—Tunnel is in 70 ft. and an incline is sunk from the back end 30 ft. deep. In this incline there appears to be about 2 1/2 ft. of ore, mostly carbonate, that I am told, is worth \$40 to the ton in silver, and carries 50 per cent. lead.

QUANDARY CO.—The shaft in this mine is down 110 ft., follows the ledge down, and pitches to the north on an angle of 10 degs., the direction of this ledge being east and west. At the bottom of this shaft there are two drifts run, one following the ledge 30 ft. east, and the other the same distance west. At the back end of the last named drift there appears to be a large body of ore, though the parties have not, as yet, drifted through it. In the east drift there is, perhaps, 2 ft. of ore in sight. The character of the ore is carbonate, with a small percentage of galena mixed, and is said to be worth from \$70 to \$80 in silver to the ton, and carries 50 per cent. of lead.

OUR FRIZ.—Location embraces \$1,000 ft. The shaft shows a vein about 18 inches thick. I understand that 5 tons of this ore were worked at Jacobs & Co.'s furnace, in this town, yielded \$81 in silver to the ton, and 50 per cent. lead.

MONO.—Cor. Utah Mining Journal, Jan. 14: The incline shaft is down 308 ft., has 5 drifts run on the right hand side in approaching the bottom of the incline, and 3 on the left. The average distance that each drift is run, is about 30 ft., making the whole distance prospected about 60 ft. This ledge is situated in a limestone formation. The character of the ore is horn-silver, black sulphurates, carbonate and galena mixed, and is said to be worth more than this ore taken from any other mine in the Territory. The company have on hand about 20 tons of high grade ore, that they think will sample \$3,000 to the ton. Also about 25 to 30 tons of second class that is worth from \$250 to \$300 per ton. The average thickness of the ledge is about 3 ft.

UTAH QUEEN.—The incline shaft is down 140 ft., and thence from the bottom of this incline, there is a tunnel run 100 ft. Thirty feet from the bottom of this tunnel there is a slope running upwards of 25 or 30 ft., that connects this tunnel with another tunnel running from the Converse shaft. The general average for thickness of ledge—for all the work done—is about 3 ft. The character of this ore is argenteriferous carbonate and oxides of lead, and is worth about \$100 to the ton on general average.

FRANKS.—Seventy-five ft. from the mouth of the incline there are chamber sets in, that appears to extend downward 50 ft., and is 30 ft. wide by 20 ft. deep. From this ore chamber, I understand, there has been a large quantity of high grade ore taken. From the lower end of the chamber there is a shaft sunk, following the ledge a distance of 220 ft. The character of ore is horn and native silver, and grey and green chlorides, carrying 5 per cent. of lead.

Mineral Land Decision.

Pre-emption Claims not Good Against Subsequent Mining Discoveries.

A decision of wide scope and great importance has just been rendered by the Acting Secretary of the Interior, on an appeal from the Sacramento Land District, involving the validity of a pre-emption claim to land thus settled upon before the approval of the Act of July 26, 1866, but subsequently discovered to be mineral. The regular Washington correspondent of the *Bulletin* writes as follows to that paper:

The following correspondence exhibits the full nature of the controversy and the reason on which the decision of this department has been based:

DEPARTMENT OF THE INTERIOR,
GENERAL LAND OFFICE, August 6, 1872.
Register and Receiver, Sacramento, Cal.
GENTLEMEN: The papers and testimony submitted with your letter of June 17th, 1872, have been examined. The only question presented is in regard to the mineral or non-mineral character of the South West quarter of the South West quarter of Section 31, T. 10 W., R. 10 E., and the N. W. 1/4 of the N. W. 1/4 of Section 6, T. 9 W., R. 10 E., Mount Diablo Meridian.

On the 21st of December, 1870, Ekin Smith filed D. S. No. 2,282, upon lot 2 of N. W. 1/4, and lots 3 and 4 of the S. W. 1/4, of Sec. 31, T. 10 N. R., 10 E., and lot 4 of N. W. 1/4, Sec. 6, T. 9 N., R. 10 E., Mt. Diablo, Meridian. On the 12th of July, 1871, Thomas Stewart filed in your office an affidavit alleging the mineral character of this S. W. quarter of the S. W. 1/4 of said Section 31, and the N. W. 1/4 of the N. W. 1/4 of said Sec. 6. You fixed upon the 24th of October, 1871, as the day of hearing, and cited said Stewart to appear and offer proof as to the character of said land. Upon the evidence submitted at said hearing, you decided first, that the land in dispute is agricultural; and, second, that the pre-emption claimant, Ekin Smith, was settled upon the land, and had acquired a pre-emption right thereto prior to the passage of the Act of Congress, entitled "An Act granting the right of way," etc., approved July 26, 1866; that down to the time of the passage of said Act of Congress, no valuable mine had been discovered on said land; that said claimant has continuously resided upon and cultivated and improved said land since his first settlement, and complied with all the provisions of the pre-emption laws; and that therefore he would be entitled to enter said land, even though a mine had been discovered thereon since the passage of said Act of Congress above referred to.

In support of this decision you refer to the 10th section of the Act of July 26, 1866, and state that the law says "that whenever, prior to the passage of this Act, * * * there have been homesteads made, etc., * * * upon lands upon which there have been no valuable mines discovered, the settlers shall have a right of pre-emption thereto."

Upon a careful examination of the evidence, this office is of the opinion that the testimony taken at said hearing establishes the mineral character of the land in dispute, and this portion of your decision is therefore reversed.

The 10th section of the Act of Congress, approved July 26, 1866, was not correctly quoted in your decision, and the conclusions which you arrived at are not correct nor in accordance with the law itself.

The 10th section of said Act reads: "That whenever prior to the passage of this Act, upon the lands heretofore designated as mineral lands which have been excluded from survey and sale, there have been homesteads made by citizens of the United States, or persons who have declared their intention to become citizens, which homesteads have been made, improved and used for agricultural purposes, and upon which there have been no valuable mines of gold, silver, cinnabar, or copper discovered, and which are properly agricultural lands. Said settlers or owners of such homesteads, shall have a right of pre-emption thereto," etc.; and the eleventh section of said Act declares "That upon the survey of the lands aforesaid, the Secretary of the Interior may designate and set apart such portions of the said lands as are clearly agricultural lands, which lands shall thereafter be subject to pre-emption and sale as other public lands of the United States, and subject to all the laws and regulations applicable to the same."

It is clear from the language of this statute that Congress did not intend to abolish or do away with the distinction between mineral and agricultural lands, or to allow mineral lands to be classed and disposed of as agricultural; but it simply provided that the public surveys might be extended over a region that was so clearly mineral in character that it had previously to the passage of said Act of Congress been reserved for mineral purposes and that such tracts as should appear to be properly and clearly agricultural might be disposed of under the laws applicable to agricultural lands.

Said section gives no rights, in other words to agricultural claimants, except to such lands as are clearly and properly agricultural. If the theory advocated by you in said decision was to be received as the proper construction of said Act of Congress of July 26, 1866, the law would be a nullity, and patents could only issue for such mining claims as had been discovered prior to July 26, 1866.

This portion of your decision is also reversed. You will inform all parties in interest of this decision, allowing sixty days from the date of

your notification in which an appeal may be taken to the Hon. Secretary of the Interior.

Please acknowledge this receipt hereof.

WILLIS DRUMMOND, Commissioner.

Letter From the Acting Secretary of the Interior—Commissioner Drummond's Decision Affirmed.

DEPARTMENT OF THE INTERIOR
WASHINGTON, D. C., December 17, 1872.
Hon. Willis Drummond, Commissioner General Land Office:

SIR—I have examined the case of Ekin Smith vs. Absalom Stewart, involving the right of said Smith to enter under this pre-emption law, as agricultural land, the southwest quarter of the southwest quarter section 31, T. 10 N. R. 10 E., and northwest quarter of northwest quarter section 6, T. 9 N. R. 10, E. M. D. M., California, on appeal from your decision of August 6, 1872.

Two questions are presented on appeal: One relating to the character of the land claimed; the other calling for a construction of the tenth section of the Mineral Act of July 26, 1866 (14 Statute, 253), on both of which questions your decision was adverse to the pre-emption claimant. After a careful review of the voluminous testimony taken before the local officers, I am satisfied that the land in controversy is mineral in character and should be held for disposition under the Mining Statutes. It is claimed on behalf of the pre-emption claimant that the 10th section of the Act of 1866 gave to qualified persons who had prior to the passage of said Act made homesteads on lands theretofore designated as mineral and excluded from survey and sale, a right of pre-emption or homestead therein, unless before the passage of said Act valuable mines of gold, silver, cinnabar or copper, had been discovered thereon, and further, that the subsequent discovery of such mines did not affect the right of pre-emption or homestead thus acquired. I fully agree with you that this is not the proper construction to be given to the Act referred to. Congress did not, I think, intend in this Act to do away with well established distinction, so long recognized by legislation, between agricultural and mineral lands, or to allow lands actually mineral to be acquired under agricultural laws. I think the object of the tenth section was to give to persons who had in good faith, made agricultural settlement on public land theretofore designated as mineral, but subsequently to be agricultural, a preference in pre-empting or entering the land as homesteads over those admitted to similar right by the eleventh section.

The department has heretofore given this construction to the Act in question by approving your instructions of December 2d and 7th, 1871, and March 20, 1872, to the Register and Receiver at Stockton, California, directing the withdrawal from disposition, under agricultural laws, of certain lands theretofore classed as agricultural, until the non-mineral character of the same should be affirmatively established. I therefore affirm your decision, and return herewith the papers transmitted with your letter of the 26th ultimo. Very respectfully,

B. R. COWEN, Acting Secretary.

Another Important Decision—Local Errors of Record do not Vitalize Selections of Land Actually Made by the State Under the Internal Improvement Act.

The Secretary of the Interior to-day decided in a case appealed from Solano county, California, that the right of the State attached to a certain "selection" made in December, 1853, under the Internal Improvement Act and was not impaired by the failure of the Register to transmit a proper record of the selection to the General Land Office.

SINGULAR STONE.—The Sacramento Union describes a curiosity found in a bed of gravel in that city, fourteen feet below the surface, while the discoverer was digging a well. It is composed of rock, hard as flint, dark green in color, with white specks, perfectly round and smooth, about 3 1/2 inches in length, about an inch in diameter in the center, and tapering to a point at either end. About half an inch from one end a hole has been drilled through it and a groove cut from the hole around the end of the stone, as if it was intended to pass a line through the hole and suspend the stone by it. The rock, however, is so excessively hard that it is almost impossible to scratch it, and the question therefore arises as to what sort of an instrument the aborigine that did the drilling—which was probably performed hundreds of years ago—used.

A MR. JENKINS, of Atchison, Kansas, has patented a new method of tempering steel. The *Champion* says in regard to it: "After heating a piece of steel to a white heat, and putting it in the tempering box, every ordinary attempt to break it was unavailing, while on the other hand, a piece of the same material, tempered in the ordinary way, and with the same effort to break it, was shivered in a dozen pieces." Mr. Jenkins has also patented a new method of working scrap-iron into certain manufactured articles; at a saving, it is claimed, of about 50 per cent. to the manufacturer.

A COPPER vacuum pan was recently constructed for an English sugar refinery costing £2,500, and being twelve and one half feet in diameter and thirteen feet deep. In it twenty-seven tons of moist sugar could be boiled in two and one half hours.

THE Cambria Iron Company has opened a night-school in the Third ward, Johnstown, Pa., for the education of boys who are employed at work in the mines. A noble work, and one that should be imitated everywhere.

The Curious in Nature.

In previous numbers of the PRESS we have, from time to time, given illustrations and short bits of natural history setting forth the peculiar traits or habits of instinct or reason, call it what we will, of some of the smaller of the animal creation, whereby they are enabled to construct their peculiar habitations or provide themselves with food in some remarkable manner.

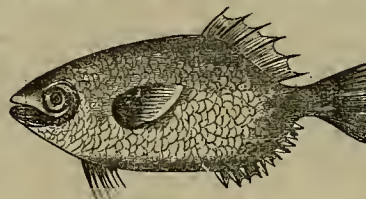
We have given the ant-lion; ants at homes; carpenter-bee; tailor-bird, etc., and now we continue the series by introducing a short history of the

Archer Fish.

This little fish, seldom exceeding six inches in length, is known to naturalists as the *Toxotes jaculator*, found in some of the fresh waters of Java and a few of the other India islands. Its appearance would indicate nothing remarkable except a slight peculiarity of form, compared with most fishes. But that which gives it peculiar interest is the manner it procures its food. It lives upon flies and other winged insects that swarm among the aquatic plants of the waters it inhabits.

Instead of leaping from the water for its prey, which few fish can do to more than once or twice their length above the surface, this little artilleryman brings its mouth only to the surface and there ejects or shoots, a single drop of water from its throat and mouth, with unerring aim, and with such force as to disable and knock down into the water any fly or insect that—as a sportsman would say—"it draws a bead on," when it becomes an easy prey.

The artilleryman—for this is a more appropriate name than archer, as it uses neither bow



THE ARCHER.

nor arrow—is easily domesticated and seems to delight in showing its powers, for which reason it is often kept as a pet, in large open vases, and loses no opportunity in throwing its shot at any unfortunate fly presenting itself, or forced within its reach; its aim is almost unerring at any distance less than three feet, and the effect perfectly stunning.

Blowpipe Analysis for Practical Men.

A very useful scheme for the qualitative determination of substances by the blowpipe has been arranged by Prof. T. Egleston, M. E., of Columbia College School of Mines, New York, and published in the *American Chemist*. He states that in the course of his instruction in blowpipe-analysis he formerly found great difficulty in teaching the students how to distinguish with certainty the substances contained in a mixture of four or five ingredients, more particularly when the most of these were metals. The old routine method of examination on charcoal, then in the closed and open tube, etc., answered very well when not more than one or two metals were present, but did not seem to answer in the hands of beginners when they came to examine alloys of complex composition. For a long time he was convinced that it was quite useless to expect of a student that he should be able, without extended practice, to determine qualitatively the composition of a very complex substance. It finally suggested itself to him that a plan similar to the one used in certain quantitative assays would answer for the general outline of qualitative work. He, therefore, prepared a provisional scheme, which, in order to test, he gave to students to work with. The result of this scheme convinced him that it was possible so to arrange one as to make it applicable to almost any compound, either natural or artificial, which could be met with in ordinary working. He therefore drew up a carefully prepared scheme, which he modified from time to time, as circumstances were suggested by its use in the Blowpipe Laboratory. The result was such that, after a few months' practice, he felt no hesitation in giving to the students at their final examination mixtures containing 21 substances, one of which contained 12 different substances to be determined. This scheme, with some slight modifications, is the one which he is at present using. It has been in constant use for three years, and has effected an entire change in the working of the laboratory, the students finding great pleasure in what was before a subject of constant uncertainty. He has published it in hope that it may help to make the use of the blowpipe in the determination of mixtures less

difficult than it appears to be when it is approached without some such guide. He acknowledges in the preparation of the scheme the valuable suggestions of his two assistants, Mr. J. H. Caswell, and H. B. Cornwall, M. E.

The substances may contain—

As. Se Cu Pb Au Cd Br SiO₂
Sb. Fe Co Bi Hg Si I No³
S. Mn Ni Ag Zn Cl Co² Ho, etc.

1. Treat on charcoal in the oxidizing flame to find volatile substances, such as arsenic, antimony, sulphur, selenium, lead, bismuth, silver, zinc, cadmium, etc. (p. 66, et seq.)

a.—If there be volatile substances present, form a coating, and test it with microcosmic salt and tin on charcoal for antimony (p. 99) or to distinguish between lead and bismuth (p. 280).

b.—If there be no volatile substances present, divide a part of the substance into three portions and proceed as in A.

a.—Yellow coat, yielding with microcosmic salt a black bead, disappearing with blue flame, no part of it yielding green Sb. flame, indicates—Pb, and Bi.

b.—Yellow coat, generally with white border, yielding black or grey bead, with microcosmic salt disappearing with blue flame; also the border disappearing with green flame indicates—Fe, and Sb.

c.—Yellow coat, very cellular to b, but yielding no blue flame, indicates—Bi, and Sb.

2.—If ARSENIC, ANTIMONY, SULPHUR, or SELENIUM be present, roast a large quantity thoroughly on charcoal (p. 77). Divide the substance into three portions and proceed as in A.

A.—TREATMENT OF THE FIRST PORTION.

Dissolve a very small quantity in borax on platinum wire in the ordinary flame and observe the color produced. Various colors will be formed by the combination of the oxides. Saturate the bead and shake it off into this porcelain dish; repeat this once or twice (p. 79).

a.—Treat these beads on charcoal with a small piece of lead, silver or gold, in a strong reducing flame (p. 113).

b.—IRON, MANGANESE, COBALT, etc., remain in the bead (p. 115).

If the bead spread out on charcoal, it must be collected to a globe by continued blowing.

Make a borax bead on platinum wire, and dissolve in it some of the fragments of the bead, reversing the rest for acids.

c.—NICKEL, COPPER, SILVER, GOLD, TIN, LEAD, and BISMUTH are reduced and collected by the lead-button (p. 115).

Remove the lead button from the bead while hot, or by breaking the latter, when cold, on the anvil, between paper, carefully preserving all the fragments.

d.—If COBALT be present, the bead will be blue.

If a large amount of IRON be present, add a little borax to prove the presence or absence of COBALT (p. 229).

If MANGANESE be present, the bead when treated on platinum wire in the oxidizing flame will become dark violet or black.

e.—If NO COBALT be present, the bead will be almost colorless.

Look here for Cr, Ti, Mo, U, W, V and Ta.

f.—Treat the button c on charcoal in the oxidizing flame until all the lead, etc., is driven off; NICKEL, COPPER, SILVER, GOLD remaining behind, or separate the lead with boracic acid (p. 442).

g.—Treat the residue g on charcoal in oxidizing flame with microcosmic salt bead, removing the button while the bead is hot.

h.—If NICKEL and COPPER be present, the bead will be green when cold (p. 292). If NICKEL only—yellow. If COPPER only—blue. Prove COPPER by treating with tin on charcoal in the reducing flame (p. 293).

i.—For SILVER and gold, make the special test No. 8.

B.—TREATMENT OF THE SECOND PORTION.

Drive off the volatile substances in the oxidizing flame on charcoal. Treat with the reducing flame, or mix with soda, and then treat with the reducing flame for ZINC, CADMIUM and TIN. If a white coating be formed, test with cobalt solution (pp. 251, 256, 276).

C.—TREATMENT OF THE THIRD PORTION.

Dissolve some of the substance in microcosmic salt on platinum wire in the oxidizing flame, observing whether Si O² be present or not, and test for MANGANESE with nitrate of potassa (p. 210).

3.—Test for ARSENIC with soda on charcoal in the reducing flame, or with dry soda in a closed tube (p. 345, et seq.). 4.—Dissolve in microcosmic salt on platinum wire in the oxidizing flame (if the substance be hot and do not contain any sulphur) and test for ANTIMONY on charcoal, with tin in the reducing flame (p. 99).

5.—Test for SELENIUM on charcoal (p. 368).

6.—In absence of selenium fuse with soda in the reducing flame, and test for SULPHUR on silver-foil (p. 365). In presence of selenium test for SULPHUR in open tube (p. 366). 7.—Test for MERCURY with dry soda in a closed tube (p. 304).

8.—Mix some of the substance with assay lead and borax glass and fuse on charcoal in the reducing flame (p. 401). Capel the lead button for SILVER (p. 407). Test with nitric acid for GOLD (p. 320).

9.—Test for CHLORINE, BROMINE and IODINE, with a bead of microcosmic salt saturated with oxide of copper. 10.—Test for Cl or Br with bisulphate of potassa (p. 374).

11.—Test for HO in a closed tube (p. 353).—Test on platinum wire or in platinum pointed forceps for coloration of the flame (p. 72, et seq.).

12.—Test for CO² with hydrochloric acid (p. 360).

13.—Test for NO³ with bisulphate of potassa (p. 354). 14.—Test for TELLURIUM in an open tube (p. 351).

The numbers refer in all cases to Professor Cornwall's translation of the last German edition of Plattner's work. In the above the metals to be sought for are printed in SMALL CAPITALS, the heavier and dotted letters being inconvenient for use in newspapers.

USEFUL INFORMATION.

Washing Wagons.

Washing wagons is too often looked upon as an operation solely for the purpose of removing a coat of mud; this is one of the objects, and an important one, but the wagon should be washed even when there is no mud on it. During the summer the varnish loses its lustre and assumes a dull, dirty appearance unless it is frequently washed. When a wagon is badly covered with dirt it is best to soak the dirt loose by wetting it with a large sponge, but not rubbing it.

In cities, where water can be forced through a pipe, the sponge need not be used until the bulk of the dirt has run off, then use the sponge, commencing at the upper portion of the body, and do not wash over too much surface at a time, as the water should never be allowed to dry on the body; after washing with a sponge, take clean water and a chamois skin, and wash, and dry immediately with the chamois.

After the body is washed, wash the carriage part and then the wheels; in washing the wheels be careful to clean out the dirt from between the spokes and wipe perfectly dry. Immediately after using a carriage in hot weather the leather and trimmings should be dusted off, and the paint well washed and wiped as directed, using soft water if possible, but never using salt water, as has been recommended by some who are afraid that the supply of water will give out in many of our cities if it is used for other than drinking purposes.

Careful washings will tend to harden the varnish, remove the particles of dust that would otherwise bed themselves in the paint, and keep the carriage fresh and clean. The leather top should also be wiped off, and if an oiled cloth be rubbed over immediately after the leather has been dried with the chamois, it will do much towards preserving the lustre of the leather and prevent it getting hard and shrinking. After washing, always rub the plated work with a woolen cloth that has a little rotten-stone on it. Many a dollar in expense and much annoyance from having a soiled carriage may be saved by thus caring for it.—*Carriage Journal*.

PREPARATION OF WAX FOR POLISHING FURNITURE.—Eight parts of white wax; two parts of resin, and one-half part of Venetian turpentine, are melted over a slow fire, and the mass, when quite melted, is poured into a sufficiently large stoneware pot, and while it is still warm, six parts of rectified turpentine are stirred in. After the lapse of 24 hours the mass has assumed the consistency of a soft butter, and is ready for use. The furniture to be polished must be previously carefully washed with soapy water; then, when the surface is quite dry, a small portion of the polish is taken up with a woolen rag and rubbed over the wood, at first gently, then more strongly. When the polish is uniformly laid on, after an interval of a quarter or half an hour, the surface is once more rubbed with a fresh clean rag. In this way the furniture receives a fine gloss, if not quite as brilliant as a shellac polish. The advantage of the polishing wax is the facility of its application, as it may be used without difficulty by any one, and the polish is not wasted by the spread of oil, as so frequently happens with ordinary polish. A further advantage consists in this, that when the furniture is soiled the polish may be cleaned in the simplest way like a coating of lac, and by repeating the above operation, a new polish is obtained each time. For small articles of furniture this polishing wax deserves a wider application than it has hitherto met with.—*Cabinet Maker*.

A SAFE COATING FOR COPPER VESSELS.—Take twelve parts of fluorspar and as much unburnt gypsum, and add one part of powdered borax. Fuse this mixture in a crucible. Pour the fused mass out, and after it is cooled grind it fine with water, so as to form a thin paste, with which the inside of the copper vessels is to be painted. After this they are set away in a warm place till the paint is dry. When it is thoroughly dry, the vessels are baked in an oven till the coating is fused. On cooling, they will be found coated with a smooth, white, opaque enamel, which adheres strongly to the copper and protects it from the action of all the vegetable acids.

TO CASE-HARDEN WROUGHT IRON.—To case-harden wrought iron, take prussiate of potash, finely pulverized, and roll the article to be hardened in it if its shape admits; if not, sprinkle the powder on it freely, while the iron is hot. This is applicable to iron axletrees, by heating the axle red with heat, and rolling it in the powder spread out for that purpose, turning it up quickly and pouring cold water upon it; then dip it in cold water as quickly as possible. The axle can be used for years without showing wear.

NUMBER OF LOCOMOTIVES.—Some of our principal railways have one locomotive for every two miles of the track, others one for every three, four, five, six or seven miles of track; smaller roads vary from one for ten to one for fifteen miles of track. Taking one to five as the average proportion, 10,000 locomotives may be assumed as the number in use in the United States.

A Railway Accident Explained—Stopping Railway Trains.

By a recent accident on the New York and Oswego Midland Railway, a freight train was completely wrecked. The accident took place while the train was running at a speed of from twenty to twenty-five miles an hour on a down grade. The train consisted of the locomotive and tender, two box cars, then two empty platform cars, followed by twelve or fourteen cars loaded with coal and other freight. The brakeman states that according to orders on down grades, he set the brakes on the box cars in front, and had just put his hand on the brake of the first platform car when he saw the second platform car was off the track. In a moment more it was thrown athwart the track, and a general crash ensued.

Among the reasons assigned for the accident was the stereotyped one, "broken rail;" also slipping of a wheel on its axle; also dropping down at a break. But Mr. Alfred Hawley, superintendent of the machine shop, who made a careful examination of the track and remains of the wreck to ascertain the correctness of these alleged reasons, gives a different report. He found the rails and road bed in perfect order, and no indications of a dropped brake or slipped wheel.

What then was the cause of the disaster? What caused the middle portion of a train to leave the track on a straight, level, well lined, well ballasted portion of the road? The accident was caused by an improper application of the brakes to the forward part of the train when running at a high speed. The checking of the front part of the train caused the heavy rear cars to crush against the light platform cars and lift them from the track. It is more than probable that many railroad accidents have been brought about from a similar cause. The breaking of a train should be commenced from the rear, when the work is not done simultaneously throughout all, or at least a large portion of the cars.

Indian Corn for Brewing Purposes.

The use of maize as a substitute for barley in the manufacture of beer, is discussed among brewers in England. Barley is unquestionably thus far the best beer-making grain produced. The principal reason why it has such advantage of other grains, is that its husk prevents the starch, which is converted into sugar in the process of malting, and then into alcohol during fermentation of the wort, from escaping into the steep, while it allows the water to pass to the starch with sufficient facility. With oats, for instance, the husk is thick, and consequently, the germination is slow, and as the end of the kernel is open, so much of the starch escapes into the steep water that the use of this grain is uneconomical as compared with barley.

At the ordinary relation in price between barley and other grains, barley contains, in a form to be readily and economically utilized, more of the sugar-forming material than can be obtained from any other cereal at the same outlay; besides which, it makes, when properly worked, a better quality of beer than other grains. But the high price of this grain has stimulated investigation as to a possible substitute, and an extensive London brewer has introduced to the attention of the trade the subject of the use of maize malt, combined with a certain proportion of sugar, in the manufacture of beer. He recommends its use especially in the manufacture of brown beers. He has been using it for a considerable period and says that it produces a full bodied, soft drinking beer, equalling in his opinion, if not surpassing that brewed from barley malt alone. It is now recommended for the manufacture of pale ales. At present prices in England it is claimed that a saving of about fifteen per cent. may be effected by this use of maize malt and sugar.

PAPER IN THE ARTS.—Inventors have not yet done experimenting with paper; for some time past they have been trying to make it useful for dondows shutters. The preparation used is the ordinary paper pulp, brought by pressure to the utmost compactness and solidity, with the lightest possible sheet-iron or other casing, to insure stability. This preparation has been brought to a high degree of perfection in Japan, where they are much more skillful in the uses of paper than we are, adapting it to all sorts of articles for domestic use, being as it is claimed, water-proof, weather-proof, and fire-proof, not liable to breakage like crockery from careless handling, nor in danger of corrosion, like most of the metals, from exposure. The material has been used to some extent in this country for furniture, clothing, car-wheels, and many other articles out of the ordinary course of things. As the stuff will not burn, the inventors expect to turn it to use as a new safeguard against fire.

A SERIES of experiments have recently been made by an English scientist to determine the degree of corrosion of iron plates in sea water alone and in contact with other metals. For equal services and equal lines he obtained as results the following: Iron alone, 8.63; in contact with brass, 29.64; in contact with tin, 74.71; in contact with gun metal bronze, 65.39; in contact with copper, 42.79; in contact with lead, 47.90.

GOOD HEALTH.

Symptoms of Fish Poisoning, and Treatment.

It is known to most persons that even fish reckoned wholesome as food, now-and-then when eaten, produce the effects of virulent poison. It is probable that most unpleasant consequences are sometimes experienced when the cause is never suspected. The most common symptoms of fish poisoning are dizziness, dimness of sight, giddiness, palpitation of the heart, and a feeling of weight and heat in the stomach and abdomen. Obligated to assume the recumbent position, the patient notices an itching of the skin; the face, and other parts, presenting red or white blotches, surrounded by a crimson ring. In the palms of the hands and soles of the feet the itching amounts to a burning sensation, and if these parts be immersed in water there is a feeling of tingling, which is regarded as characteristic of the disease. Pains in the limbs and at the joints are also commonly present.

In cases likely to prove fatal there are intense abdominal pains, dysenteric symptoms, and often convulsions. When convalescence begins, the ear skin peels off as after scarlatina, and the hair, and sometimes even the nails drop off. The effects are often felt for years, and disappear only by degrees, and after removal to a cold climate.

A word or two regarding treatment. We must, in the first place, attempt to get rid of the poisonous matter by clearing out the stomach with an emetic, of a scruple of sulphate of zinc, or of a large teaspoonful of powdered mustard in a tumbler of tepid water. Dilute drinks, such as barley water, or toast and water, should then be freely given, after which, if the patient be not too prostrated, a dose of castor oil will serve to expel any noxious matter that may have got beyond the reach of the emetic. The poison having thus, as far as possible, been evacuated, its effects must be combated with stimulants, such as coffee, wine, and alcoholic liquors. If the vomiting and intestinal pains do not yield to this treatment, opium, especially in the form of Dover's powder, in doses of five grains or more, three or four times a day, should be given.—*Druggist's Circular*.

Taking our Food.

An intelligent sea-captain hailing out of New Bedford says: "I have made several voyages to St. Petersburg, in Russia. The people of Russia generally subsist, for the most part, on coarse black rye bread and garlics. The bread is exceedingly coarse, sometimes containing almost whole grains, and it is very hard and dry. I have often hired men to labor for me in Russia, which they could do from sixteen to eighteen hours, and find themselves, for eight cents a day, the sun shining there sometimes twenty hours a day. They would come on board in the morning with a piece of their black bread, weighing about a pound, and a bunch of garlic as big as one's fist. This was all their nourishment for the day of sixteen or eighteen hours' labor. They were astonishingly powerful and active, and endured severe and protracted labor far beyond any of my men. Some of these men were eighty and ninety years old, and yet these old men would do more work than any of the middle-aged men belonging to my ship. In handling and stowing away iron, and in stowing away hemp with the jack-screw, they exhibited most astonishing power. They were full of agility, vivacity and even hilarity, singing as they labored with all the buoyancy and blitheness of youth.

Dr. Dio Lewis in referring to the above says: We Americans eat too much animal food. In consequence, many of us are feverish and prematurely old. During the cold season hard workers need meat, but only once a day. Beef and mutton are best. We think a majority will do well to take this meat for breakfast.

We have now for a few months been living in the following way, with great satisfaction: We breakfast at seven o'clock, and fill our stomach with solid beef and bread. At one o'clock we take a dish of oatmeal or an oyster stew, without milk or butter. Nothing more till next morning. By this plan we can continue our mental labor during the afternoon with no more inconvenience than in the morning. With the accumulated vigor of the night's rest and sleep, we can digest the hearty breakfast without heaviness, even while we are using muscle and brain. We have recommended this plan of living to several editors and other literary friends, and most of them have reported to us perfect satisfaction. One gentleman says, with enthusiasm, that he finds in it a gain in flesh and complete relief from the headache, heaviness and other discomforts which had grown to considerable proportions. This all means that, with the large vital force of the morning hours, we can digest a strong breakfast and at the same time carry on intellectual and physical exertion, but that when the vigor from the night's sleep has been partly expended and we come to the dinner, a hearty meal takes so much from the brain that dullness is inevitable.

To Mothers.

In the management of your little ones, nobody doubts your readiness to sacrifice yourselves for them; but your methods, the wisdom of your service, may often justly be questioned.

At this time we ask your attention to a suggestion or two in regard to your methods of feeding your babies. You know how vital regularity is with us grown people. We may take the plainest food, and in moderate quantity; if no attention be paid to times and seasons, our digestion will soon be deranged. A man may eat nothing but beef and stale bread, the two best articles of food with which we are acquainted, and he may take them in proper quantities; in a month he will have dyspepsia if he constantly changes the hours of his meals. It is not the kind of food we eat at railroad stations, but the irregularity of the hours of eating, which so deranges our stomachs. Now we all know this to be true of ourselves—grown-up, matured, tough people; we believe it to rest upon a physical law. And, in view of this law, let us consider how you feed your baby. You put it to your breast whenever it is uneasy. No matter what makes it cry; if it is hungry, or cold, or has a pin stuck in its back, or is surfeited and has the colic—no matter what may be the cause of its crying or worrying—you treat it with the same remedy—a dose of milk. The little thing does not know that milk is bad for it, and so it goes on sucking. It has learned to do but one thing—to suck; and in its eagerness to get relief it will do that thing fifty times a day. In this way it is made feverish and thirsty. Its little pulse will run up to a very high rate. It is suffering with thirst. Like all creatures with thirst, it needs water. Nothing could be worse than milk. It is poison even to a strong man with a fever. What do you give your baby with a fever? One thing, and one only, and that is milk. Milk, milk, is the food and drink of every baby, given to it five, ten, twenty or fifty times a day, just as it happens. At night it is coaxed to dine every time it wakes up.

A baby six to twelve months old should be nursed about eight o'clock in the morning, and it should have time to get all it wants. Every three hours, till bedtime or nine o'clock at night, it should have a good meal, which should be given with perfect regularity. During the night, nothing whatever. In a month the baby will not only become accustomed to this, but upon this system the little chap will flourish as he never did before. More than half of the stomach and bowel diseases, fevers and fits, from which babies suffer and die, come from irregularity and excess in feeding them.—*Dio Lewis*.

Stomach and Brain.

If it be true—and we suppose it is—that the stomach and the brain are so interrelated that the condition of one organ defines the state of the other, then the man who teaches us the proper laws of cookery must be regarded as a benefactor of his species. One of our leading literary journals recently declared that more good food is worse wasted in this country than anywhere else on earth, and the fact is admitted by all who have had the opportunity to break bread at European tables. It is a proverbial saying that a Frenchman will get three courses out of a bone, and the economies of the German are almost equally famous. The dense populations, the low wage and the distinctions of classes in Europe compel the people to make the most of what they possess. There is very little waste, and hardly any trace of the tendency to dyspepsia which is so peculiar to Americans; and human life is longer and happier in consequence. Our people, bent upon getting through the world in a hurry and generally careless of their diet, might learn something from the Englishman, the Frenchman and the German, and even from the stolid Indian of the far West. Better methods of cooking, less haste in eating, and smaller consumption of unwholesome articles of food, would not only lengthen the average term of life in this country, but also by giving the American stomach better treatment than it now receives, and improve the quality of the American brain.

TAKE CARE OF YOUR HEALTH.—Girls, take care of your health—it is your capital in life. With it you can do great and noble things; without it, the little duties of life become a burden, and your time, which should be spent in good works, must be given to your own personal wants. Do not think that exposure will not injure you because you do not suffer at the time. Do not go, with only a thin gauze covering over your shoulders, in the night-air. Do not change heavy shoes for thin ones, to go riding. Follow no fashion that injures the health. If you want to be old and broken-down at thirty, pay more attention to what some unscrupulous leader of fashion says than to Nature's laws. Loosen your clothing about your waist. Draw in a long breath, and if your clothes press against you, you may know they are worn too tight. They can be worn sufficiently loose only by letting the weight come upon the shoulders. If you would have a clear, fresh complexion, free from eruptions, give your blood a chance to circulate and purify itself.—*Ex*.

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San Francisco:
Saturday Morning, Jan. 25, 1873.

Legal Tender Rates.—S. F., Thurs., Jan. 23.—buying 88½; selling 89.

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REBUILT.—The wagon-works of J. W. Farron, No. 121 Beale street, which were totally destroyed by fire in November last, are now entirely rebuilt, and the business of this large establishment is once more in full blast. Mr. Farron has shown considerable pluck and perseverance in re-building his premises and recommencing business in so short a time. The fire was a most disastrous one, sufficient, in fact, to discourage any one of a less sanguine temperament than Mr. F. He informs us that he has more orders on hand than can be completed this month, and, from the appearance of his factory, we should say that this statement is correct.

VIENNA EXPOSITION.—The appropriation by the United States Senate for defraying the expenses of exhibiting American productions at the approaching Vienna Exposition, has been increased to \$300,000. We have frequently alluded to the importance of this Exhibition to the people of the United States, and are glad to see that active measures are being taken, which will result in an appropriate American display.

THE POLYTECHNIC LECTURES.—Mr. Amos Bowman will form a class on special and mining geology on Tuesday evening next at the Mechanics' Institute. Mr. Hanks is organizing a similar class in practical mineralogy at the same place.

S. F. TRADE GUIDE.—Messrs. Bishop & Co. have just issued the January number of their Semi-annual Business Directory of San Francisco. Among other features we notice they have inserted a directory of the streets.

THE FIRST QUARTZ MILL IN CALIFORNIA.—The *Mariposa Gazette* of this week answers our queries in relation to the location of the first quartz mill built in California, but we are unable to give the article until next issue for want of space.

The new shaft for the steamer Arizona, from the Risdon Iron Works, has been placed in position.

The "Ancient" Pliocene Rivers of California.

Origin of the Auriferous Gravel Deposits.

The lecture by Amos Bowman, of the Geological Survey, on Thursday evening of last week, was one of much interest to all who desire to become acquainted with the wonderful geological events which preceded and led immediately to the present configuration of the country now embraced within our Pacific States and Territories, and during which the immense deposits of auriferous gravel were formed, which are affording such golden harvests to the miners of California. The lecture took a wide range, and embraced much to which we cannot now refer; but to which we may again return in a future issue. We propose now to simply confine our report to a few notes on the early physical condition of this Coast, the Pliocene rivers of California, and the origin of the auriferous gravel deposits; and in doing so, we shall not attempt to give the remarks of the lecturer in full, or to follow his words in what we do give.

The Ancient Sea of the Sacramento Valley.

After a brief introduction, including the explanation that the Pliocene Period was the concluding epoch of the last great geological subdivision of time, at the conclusion of which the upright, mammalian, walking and articulating man, made his appearance on the earth, the speaker pictured to his audience the Pliocene Sea, which once occupied the region now known as the Sacramento Valley, and extending from near Shasta on the north to the extreme southern limit of the Tulare Valley on the south.

Standing upon the top of some jutting rock, about midway up the Slope of the Sierra Nevada, and looking westward, before you lies this vast departed sea of the period of the ancient rivers, embraced in one grand sweep of vision, extending some three hundred miles in length, and covering about 30,000 miles of area, with a depth of over a thousand feet below the present bed of the Sacramento river, as is shown by the Stockton artesian well, which yielded golden sands to near its bottom. The Marysville Buttes were then a fiery island, like Stromboli, of the Mediterranean. Farther to the north was Mount Shasta, built up to a height of 14,000 feet by its erupting lavas. Still further north, Mounts Hood and Baker—twin brothers of Shasta—presented their lofty summits, helching forth fire and smoke. Directly in front of the observer were Mounts Disblo and Tamalpais, between which were the straits, which connected this sea or gulf with the ocean. In the rear, and not far distant, might have been seen a long line of volcanoes flaming up from far into Oregon, and following the present summit of the Sierras, as far south as Silver Mountain, Mono, and beyond.

This ancient sea was separated from the ocean by a range of low hills or islands, along what is now known as the Coast Range. The waters stood on the flanks of the Sierra Nevada at an altitude of about 600 feet, above the present base of the foot-hills—near the level of where is now Shasta City; above Horse Town; not far from Oroville and Timbuctoo; somewhere between Pino and Auburn; above Knight's Ferry, and not far below the base of the Tuolumne and Calaveras Table Mountain. The shores of this ancient pliocene sea, the adjacent islands, and the gentle slopes of the Sierras (not then as high as now) were clothed with forests, differing materially from those now existing in that locality, and embracing countless numbers of palms. Huge turtles wallowed in the shallow bays, and strange ante-diluvian animals,—huge elephants, twice as large as any now in existence; oxen of proportionate size, and mastodons, tapirs and camels roamed through the forests. Horses were then natives of this continent, and primeval man, differing materially from any present races, was then existing, and with the animals joint possessors of the soil, and a witness of the grand physical phenomena to be described. He alone, however, of the animals named, was enabled to survive the convulsions of nature and changes of climate; and this he did by his well-known independence of geographical range and conditions, and his superior capacity for guarding against the vicissitudes of time and change.

At this time those famous rivers, the gravel-filled beds of which are now affording such abundant harvests of gold mines, were pouring their waters into the pliocene sea. Such was the physical and topographical condition of things in this portion of the world in the plio-

cene era—a hundred thousand years ago, more or less. But as change is Nature's law, this state of things could not exist forever.

Following those changes as recorded in the Book of Nature—and God tells us no uncertain tale, but always leaves us a sample piece from which we may reason inductively or by analogy—we arrive at

A Series of Great Natural Events,

Corresponding to great periods of time, which were stated by the lecturer substantially as follows:

1st.—The Pliocene or ancient eroding period, during which these deep, "dead" river channels were cut into the "bed-rock."

2d.—These Pliocene channels filling up with gravel—or the choking or damming period.

3d.—The active volcanic period of the Sierra when the gravels were capped with lava and volcanic ashes.

4th.—The cold or glacial period, when the mountain slopes were covered with living, moving glaciers.

5th.—The modern erosive, or recent period, during which the present river channels were formed, crossing the old channels at various angles.

This peculiar action of successive erosions and filling was not due to local causes, as it applies with great uniformity to all the streams alike, throughout four or five degrees of latitude.

We solve the problem of the Pliocene rivers when we ascertain what made the rivers cease cutting, at some period in the Tertiary, and fill up some 1,200 feet with gravel and boulders at the end of the Pliocene—as marked by the volcanic outbursts—to renew the extraordinary erosive action which has resulted in our present world-famous cañons. Only two causes of a general nature, such as the case calls for, can be mentioned:

1st. Changes in the quantity of rain; or, 2d, changes in the grades of the rivers. The same or even a larger quantity of water would have been inadequate to clear the cañons of the loose, red material from the heights where such water was enabled to disengage it, and to bring it as far as to the cañons, where the gravel remains to this day.

A rainless Pliocene period, such as would be implied under the first condition, we know from the rich tropical character of the vegetation found fossil in the gravels, could not have existed. A rainless period would not have produced the washed gravel boulders, loosened and rounded and carried as far as the deep cañons and then dropped. There would not have been power to produce any gravel, to say nothing of transporting it.

The speaker ascribed the filling to a lessening of the grades, perhaps by the force which caused the uplift of the Coast Range. This uplift occurred during the Pliocene period to the extent of at least 800 feet, near Mount Disblo—that being the difference between the height of the Miocene rocks that were uplifted during the Pliocene epoch. Or the subsidence of the coast may have had something to do with it. The general post-pliocene rise of the land, including the crest of the Sierra, furnished the erosive grades for the present cañons.

The Course of the Ancient Rivers

Has been frequently remarked to be "at right angles" to that of the present streams. In any change of bed, such as has been described, there would necessarily be crossing and re-crossings, at right angles and at all other angles, by the displaced waters, thrown from their ancient channels and compelled to seek new courses. No uniformity of crossing or angle, in one direction more than another, has ever been attempted to be shown by actual surveys or measurements. The speaker remarked that after devoting considerable time and labor to collecting facts for the determination of this question, he had arrived at the general conclusion that the "ancient rivers do not appear to have materially varied in their general course from the rivers now existing. If such be not the case, the contrary at least remains to be proven. [The Big Blue Lead is now pronounced a myth, as it is found passing through nearly every claim looted in "deep gravel."] The source from

Whence Came the Auriferous Gravels of California? was pointed out by reference to a diagram, a representation of which was given in our issue of January 14th, under the head of "About California's Gold-Bearing Rocks."

We may readily calculate from the vast quantities of subaqueous detritus in the Sacramento Valley, and that read by the testimony of the ancient rivers and the present river cañons of the Sierras, whence came this immense auriferous deposit. Commencing in the Sacramento Valley we find an immense area of gravel and fine detritus—some 300 miles in extent by 50 wide, and averaging many hundreds of feet in depth, every portion of which is more or less charged with fine gold. As we pass out of the valley into the foothills the gravel becomes coarser and shallower, until, as we ascend, the rocks in places are completely hard, and the gravel is confined mostly to the cañons and valleys of recent denudation. Here and there, however, we meet with larger masses of gravel, as at Smartsville, Pilot Hill, Newcastle and Oroville, which are evidently portions of the ancient river beds, that the more recent erosive action has never disturbed. Here we find, mixed with the gravel small water worn boulders, which increase in average size as we ascend towards the summit of the Sierra. At a certain elevation we find massive boulders—some of them many tons in weight, showing a greater declivity in the river courses, by which it was possible for

such rock masses to be moved by aqueous agency.

In many localities, as in the Calaveras Table Mountain, we find, these accumulated gravel deposits filling the ancient Pliocene river cañons to the brim and sealed up, as it were, by immense overflows of lava and mud and volcanic ashes.

Going back to the time when the Pliocene rivers commenced their flow, rapidly at first in the higher portions of the Sierras, and gradually lessening the force of their currents as their waters reached the more level land near their mouths, at the shores of the ancient sea, we see the commencement of the erosive action by which the earliest of the auriferous gravel was produced: Following down the long geological period to the time when the damming up of those rivers first commenced, and the outflow of gravel to the Sacramento Valley was checked, by which the ancient channels were filled; and passing from thence to the period when those rivers were forced out of their channels, and compelled to form new beds with consequent increased erosive action, the breaking down of quartz veins and partial disturbance of the pliocene gravel beds; occurrences which must have occupied many hundreds of thousands of years, we find abundant evidence of the origin of the auriferous gravel, which is now found so universally spread over the western flank of the Sierra Nevada. The great sluices of Nature and the powerfully erosive action of glaciers and alternating frosts in the higher altitudes, operating for immense geological periods of time, have been washing and wearing away the mountain side until it has been cut down though its whole extent at least an average of 1,000 feet, thus liberating the gold from its ledges of quartz, freeing it of its vast mass of earth, which has filled up the entire Sacramento Valley, and leaving for man only the work of "cleaning up."

Academy of Sciences.

The regular semi-monthly meeting of the Academy was held on the 20th inst., Professor Davidson in the chair. The following named gentlemen were elected members of the Academy: Hon. J. P. Jones (life member), A. A. Gansl (life member), T. Parrott, (life member), Ossper Schenck, George T. Merye, Jr., (life member), E. L. Beard, Montgomery Fletcher, Samuel P. Middleton. A number of propositions for membership were received and laid over to the next meeting. R. E. C. Stearns, one of the oldest members of the Academy, on recommendation of the Trustees, was elected to life membership without fee, in recognition of distinguished services.

Donations to Cabinet and Library.

H. G. Hanks presented specimens of a new mineral designated as Durangite, having the form of small granules of a dull red color. The specimens were received from Durango, Mexico, in which vicinity the substance exists in considerable quantities, but previously only a few specimens were known to the scientific world. This mineral has no special value, and the specimens were only prized as curious formations.

The Secretary announced the receipt of a list of about 150 works, in different languages, from the Smithsonian Institute, Washington, comprising publications of value from the scientific societies of Europe.

Dr. Kellogg announced that at the next meeting of the Academy he should present a number of specimens of rare plants of this Coast, not heretofore commonly known to the members.

Miscellaneous.

Professor Davidson worked out on the black board four new propositions in mensuration, having a practical value in mechanical and engineering operations.

Dr. Gibbons exhibited specimens of a tape worm engendered in the human system from eating rare beef which contained the germs. In the course of his remarks he stated that a few months ago, a little child was affected with tape-worm. In due course of time all traces of the tape was eradicated from her system, when shortly afterward a new species of worm made its appearance, which he denominated as being the beef tape-worm. The child had been fed for a while on pieces of raw beef, and to this he attributed the appearance of the worm.

Iron Sands Again.

It will be remembered that not long since Dr. Stout called the attention of the Academy to the fact of the existence on this Coast of extensive deposits of iron sands. A quantity of black sand of the magnetic oxide of iron had been presented in proof of the statement, but had been rejected by most of the members. Some, the speaker said, entertain the view that this sand was originally caused by volcanic action; others contend that through atmospheric changes large masses of iron disintegrated itself, and forming itself into particles became united with the white sand. He had brought specimens of the sand with him, one of which was the magnetic oxide of iron, while the other was non-magnetic. Some little discussion ensued on the subject which will probably be continued more at length at a future meeting.

Professor Davidson stated that steps were being taken by the Trustees to obtain more suitable rooms for the Academy. The meeting then adjourned.

Home Industries—Manufacture of Sub-Marine Telegraph Cable.

The manufacture of wire rope has been carried on for some time in this city, but until recently no attempts have been made to manufacture sub-marine telegraph cables, and in fact there has been little need for it here until the past few years. We paid a visit this week to Hallidie's Wire Rope and Sub-Marine Telegraph Cable Works on the corner of Vallejo and Sansome streets, to see a cable that was being made for the Electrical Construction and Maintenance Company. The premises occupy a fifty-acre lot near the water, and in a convenient place for shipping. The main building is two stories in height, the lower story of which is used for the machinery and the upper for a loft or place for fitting ropes, etc. There are three wire rope making machines of different sizes in the building, besides the one used for making this cable. While there we saw a three-inch wire-rope 300 feet long made in nine minutes. Of course the bobbins, etc., were previously prepared.

The cable is made on one of Bowden Bros' horizontal cable machines of twelve spindles, constructed at Newcastle-on-Tyne, England. A piece of cable two miles long has just been shipped, and the piece being made will, when finished, be 13,200 feet, or about two and a half miles in length. The core consists of seven number 22 copper wires thoroughly insulated up to 5-16 of an inch in diameter, covered with gutta percha and Chatterton's compound; over this is a layer of canvass and rope yarn, measuring in all 9-16 of an inch. Outside of this core are twelve No. 9 galvanized iron wires, each of which has a tensile strength of 1,500 pounds. When finished the cable is about one inch in diameter, and weighs in round numbers, four-fifths of a pound to the foot. The gross weight of the cable and reel upon which it is wound, for the one length of two and a half miles, will be 13,000 pounds. The factory with its present machinery can turn out a mile of cable in a day of ten hours. They made 12,000 fathoms on last Saturday night; still another piece is to be made.

In making the cable, the core passes through the hollow shaft of the machine and meeting the wires at a central point is covered by them. The twelve bobbins revolve around a common center and the rope is drawn on to the reel by gearing attached to the reel. Considerable care is required to keep an exact strain on all the bobbins, for if one wire breaks the machine has to be stopped in order to join the ends.

This enterprise is of course as yet only in its infancy, but the proprietor hopes to extend his business ultimately to greater proportions. In fact, the main cause of its foundation is that they are in hope of being able to make the China and other cables for the Pacific. The great danger to be apprehended in the transportation of submarine cable is from the change of temperature in crossing the tropics, as shown by the experience of the Red Sea and Panama cables. The only safe way is to lay it in large tanks filled with water; the reason why the Atlantic cable was so successful was that it was put down in a favorable season with no extreme heat, and is, moreover, in a northern latitude. If a cable to run to China were built in the Eastern States and shipped here it would have to be carried across the tropics twice, and it would be impracticable to put large lengths on cars and then re-ship it into vessels. Therefore it will be much more economical, and at the same time more convenient to have these cables made here, and this factory will be able to make them. In such a case of course appropriate machinery will be supplied for turning out large pieces.

The factory employs at present 14 men. The engine and boiler are in a shed adjoining the main building. Large scales are placed in a convenient position for weighing the wire, etc., and there is a commodious yard with store-houses for surplus stock, etc. The wire ropes for mining purposes, etc., are not generally made of galvanized wire but of common wire which receives a coating of Stockholm tar. The tar in the tanks is heated by steam, to avoid the use of fire on the premises as much as possible. We saw at the factory the old hoisting rope of the Amador mine, which has been lying since the fire at the bottom of the shaft. It is now being repaired and straightened, a thing which seemed almost impossible as it was twisted and unwound in every direction, and was covered with rust. They have made at this factory wire ropes 4,000 feet long. The establishment is very complete, and may be ranked as one of the rising industries of the State.

CALIFORNIA MINING MACHINERY FOR COLORADO.—We have been shown a letter from a mining superintendent in Colorado, ordering a number of Hendy's concentrators to be sent to Georgetown, Cal. Two concentrators which were there on trial, have worked in so satisfactory a manner on roasted ore or the tailings as they passed from the settlers that the others were ordered. The Superintendent recommends them as working well.

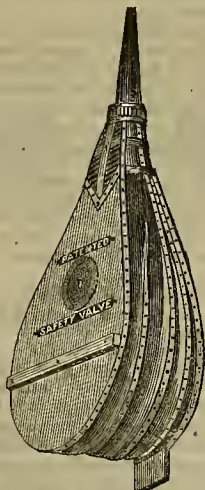
The Enterprise Sawing and Planing Mill.

The business of finishing lumber in all shapes is quite an extensive one in this city, for from here all the interior towns are supplied with sashes, doors, blinds, mouldings, etc. The extensive lumber region to the north of us finds a ready market in this city and large quantities of rough lumber are made into shape here before being shipped to the country. Among the most prominent and oldest established sawing and planing mills in the city is the Enterprise, owned by D. A. Macdonald & Co., a representation of which is shown on this page. This establishment is now one of the largest and most complete on the Coast, and the machinery is of the latest and most improved pattern, capable of turning out all kinds of mill work to the best advantage. This mill was established in 1854 and was then located on the corner of Market and Beale streets, and known as Chace's Mill. It has been in the present location, 217 and 225 Spear street, for two and a half years. The premises occupy five water lots and run through from Spear to Stuart street.

The 100 horse-power engine which furnishes



power for the machinery, was built at the Risdon Iron Works, and is set on a very solid, well-constructed bed, as it is on made ground. The fly wheel weighs 7,750 pounds, and the main belt is 24 inches wide and 124 feet long. The boiler is in a separate house from the engine and entirely distinct from the mill. The lower story of this edifice contains the boiler, etc., and the upper is utilized as a drying room, having a capacity for holding 20,000 feet of lumber. The house is as fire-proof as it can be



IMPROVED SAFETY BELLOWS.

made, being of brick with iron rafters and roof; above the rafters is a heavy layer of brick and mortar. Water pipes are laid throughout the mill and hose is kept in many different places in readiness in case of fire. The proprietors in their long established business in this city have been peculiarly fortunate in more than one respect, for they have never been burnt out. There are 35 wood-working machines in the mill, so they are able to turn out every class of work. The assortment of mouldings, frames, brackets, etc., is particularly complete. The firm has issued a hand book of mouldings for the benefit of their customers in the interior,

who can send for what they want by ordering according to class and number.

This lower story of the mill is used for heavy work, while the upper, divided off into departments is for different classes of work. A small inclined tramway runs from the rear end of the second story to the ground and a rope and pulley carries the material up and down as desired. The mill covers three water lots and the remainder of the ground is used for storing lumber. This machinery is all very complete and is adapted for all kinds of wood work, planing, sawing and cutting in all departments. About 75 men are now employed, but they expect to have about 200 at work this summer. A large amount of the products of this mill is shipped to Oregon, Washington Territory, Utah and the interior of this State. The furthest point to which they ship is Salt Lake City. This enterprise was started in 1854 by Chace and McDonald, and at that time they began with a little engine and boiler, one circular saw, and a planing machine. They have a good reputation for the work turned out, and for their energy and perseverance. This is a dull season of the year for this trade, but nevertheless, a brisk business is being done.

Non-Explosive Bellows.

The California Bellows Manufacturing Company, of this city, is now making a new style of bellows, which they call the non-explosive,

a cut of which is shown on this page. The principle of construction is the same as in ordinary bellows, with the exception that a peculiar safety-valve, the invention of Joshua Hendy of this city, is used, instead of the common valve for permitting the air to enter. This valve is simply a disk of perforated iron, on the under side of which a circular piece of gutta-percha is secured to its center. The valve is attached to the top board instead of the bottom as usual, and the action of the bellows closes it; when the bellows cease to blow, the valve opens immediately, admitting air into the top chamber, which prevents its filling with gas, thereby preserving the leather from the heat, as well as preventing explosions. The law of the universal diffusion of gases operates to a disadvantage in the case of bellows, and accidents have happened from the bellows being filled with gas, whereby persons have been seriously injured and some killed outright. The manufacturers claim that this simple valve obviates all danger from this cause and at the same time preserves the leather of which the bellows is partially constructed.

THE ASSAYERS OF NEVADA VS. THE CARSON BRANCH MINT.—The managers of the U. S. Branch Mint at Carson City, Nevada, have recently taken upon themselves, as alleged, "without authority of law," to assay ores, bullion, etc., for the public, whereat the outside assayers are indignant, for the reason that it threatens to ruin their business. The assayers, through Conrad Wiegand, Esq., formerly assayer of the mint in this city, have accordingly issued a "protest and petition to Congress" wherein they ask for remedial legislation which will compel the mint to confine itself to its legitimate business. The protest, etc., comprises a well and forcibly written pamphlet of 60 pages, wherein the practice above set forth is declared "a useless, unjustifiable and wanton interference with a legitimate private industry."

COAST SURVEY.—The steamer Hassler has started on her trip for the survey of the Coast between San Diego and Panama. This survey is something which should have been made a long time ago, as the charts, etc., of the lower Coast are very imperfect.

The Movements of the Stars.

The third of the Polytechnic Course of Lectures, by the University Professors, was delivered on Saturday evening last by Professor John Le Conte, at Corinthian Hall, on the "Stars and their Movements." This interest in these lectures is well manifested by the large attendance. We regret that the want of room compels us to confine our notice of this interesting and instructive lecture to a brief synopsis.

Immensity of Space.

Discussing the vast distances of the fixed stars, the lecturer said that beyond the boundaries of our solar system there is a vast and almost illimitable abyss of space—a vast, empty chasm, in which no material body of any considerable magnitude exists. A portion of this space is traversed by comets which have long periods of return. If any large body exists there, though it might not be seen by the eye of man, yet it would make itself known by the disturbing influence of its attraction.

Under the guidance of science, man has also become fully assured that beyond this immense void a stellar universe exists, the nearest members of which are so remote that the mind of man can scarce comprehend the vast distance. Moreover, the many striking indications of the unity of plan which pervades the universe leads us to believe that all the stars which we see in space are centers of other systems, and are also separated from each other by a similarly wide void, which we find around our own solar system.

Distances of the Stars.

The Professor proceeded to explain the difficulty which early astronomers experienced in demonstrating the absolute fact of the wide separation of the fixed stars from our system. The well-known principles of the measurement of distances by geometry and trigonometry were first applied by using the diameter of the earth (eight thousand miles) as a base; but no parallax was observable. The same result was at first obtained when the diameter of the earth's orbit (about 190 millions of miles), was employed as a base. But with the perfection of instruments capable of measuring exceedingly small angular distances, slight variations in the apparent relative position of certain stars have been observed from which it is easy to calculate the approximate distance of such bodies from the observer.

Again, the same instruments and the same modes of measurements when applied to other stars show no change of position, and of course afford no means by which we may calculate their actual distance, although their distance is thereby fixed as beyond a certain limit due to the length of the base line and the power of the instrument for measuring minute angles.

Bradley commenced his observations for determining the parallax of stars about 1725, and discovered aberration and nutation. Galileo subsequently introduced improved methods of observation, and Herschel in 1781 introduced a method still superior; and formed a catalogue of stars best adapted for its application. All the efforts of astronomers, even up to his time, failed to detect any sensible stellar parallax. The labors of Herschel, however, were rewarded by the important discovery of the double stars. The great trouble, all this while was mainly due to the imperfection of instruments. The instruments at first employed would measure an angle of only one minute, which testified to a distance of only 3,438 times the earth's mean distance from the sun (ninety-five millions of miles.) Bradley, who made the first important progressive step in this enquiry, reduced the measurement of the angle to one second, which increased the distance of measurement to 206,265 times 95,000,000 miles, but still failed to detect a parallax—thus being unable to find a star within that distance of the earth.

Since his time the perfection of instruments has been such that a distance can now be measured equal to 2,062,648 times 95,000,000 miles, within which it is proven that many stars are found, and beyond which it is known that an innumerable number exists. The distance of the nearest fixed star expressed in words is—twenty-one and a half millions of millions of miles! When we reflect on stellar distances we are overwhelmed with the immensity of the numbers required for their expression.

Our Sun an Exceedingly Small Star, as Seen from other Systems.

The lecturer said that a globe large enough to fill the entire space enclosed within the earth's orbit, would appear at the distance of the nearest fixed star hardly larger than the third satellite of Jupiter, and of course invisible to the naked eye. [From this comparison we may infer that our sun, immense as it seems to us, when compared with any one of the fixed stars, must bear quite as small a proportion as would a globe of only some 10 miles in diameter to the entire bulk of the earth!]

The problem of the movements of the stars and their distances was not fully solved until 1838, when Bessel announced the results of his observations on 61 Cygni. These observations were further, and more fully verified in 1839-40.

The Mines of the Ruby Consolidated Company, (Limited).

At our solicitation, a friend has furnished us with the following notes of a visit which he made to the mines of the above named company a short time since. From an examination which we ourselves had made of some of these mines, we believe that our friend's observations are exceedingly accurate. The first mine visited was

The Bullwhacker,

Which is one of the leading and most promising of any in the district. This mine is what experts would term a "fissure line deposit lode;" that is to say, the ore bodies are found on either side of the true line. The main shaft has been sunk to a depth of 243 feet, lowest exploration, disclosing ore bodies of high grade galena by a drift of 185 feet. Eighty feet from the surface, in the main shaft, a drift has been run along the line or wall southwest a distance of 190 feet, commencing with what is known as the south shaft. In this drift, ore is to be seen in good quantities almost the entire distance; also in the different stopes making upward from the drift. The mine at present is producing twenty tons of ore per day, and, if necessary, could double the amount for many days to come.

The Dunderberg

Was found, rather unexpectedly too, what may be called a true fissure vein. The main shaft has been sunk by incline 150 feet deep, the vein being traceable from the surface to the bottom, varying in width from 7 feet to 10 inches. In the lowest working, the vein varies from 10 to 28 inches in width. A noticeable feature in this mine is the true clay selvage at the upper wall, varying in thickness from 1 to 6 feet. The mine is at present producing daily an average of 14 tons of ore, and, from its appearance, should give good returns. Work on both the Bullwhacker and Dunderberg is being vigorously prosecuted by double shifts of men, and with much good judgment. Next, further on and up the mountain, our informant examined the two series of mines, closely situated, known as the

Lord Byron and Valentine.

The descent into the Lord Byron was anything but pleasant, from the fact of being obliged to continue downward until the bottom was reached, 220 feet from the surface. On close examination in the bottom working of the shaft, the ore body was found to be about 5 feet in width of what appeared as high-grade carbonates, intermixed with galena. In ascending, more attention was given to the ore along the line or sides of the shaft, almost continuous to the surface, with, of course, the usual characteristic called pinching here and there; but to the credit of the mine, the shaft promises very well indeed. In the Valentine shaft, at a distance of 128 feet, 60 feet of which has been sunk in the usual way, the bottom of the shaft opened into a natural cave, measuring 125 feet, at an angle of 45 degrees. Splendid ore bodies of high grade carbonates have been disclosed throughout the cave, and give good promise of a fine mine. There are several other shafts on the Valentine series, varying in depth from 60 to 120 feet, all of which show more or less good ore.

The El Dorado

Series was the next in order; but when shown the locality and observing the time the visitor's courage failed. The El Dorado, however, as is well known, is still producing, without doubt, the highest grade of ore in silver and gold of any mine in the district.

The Reduction Works

Of the company are by far the most suitably located of any in the district, and to some one belongs the credit of the good judgment with which the site was selected, as also, the efficient arrangement for the expeditious and convenient handling of ores, slag, etc. It was the intention of the company to have erected at least two first-class furnaces; but the winter months had approached so closely before the completion of the present one, that it was deemed advisable, on its completion, to commence the production of bullion as soon as possible. This was done; and, everything being in readiness on the 15th day of November last, Superintendent L. N. Dougherty gave the signal to "let her go." She did go, and nicely too; and is still going, if one can judge from outside appearances. She will probably run the old year out, and continue through the month of January, 1873. The furnace turned out, for the week ending December 23, fifty-one and nine-tenths tons of bullion, or an average per day of seven tons and over. On the 24th of December, of the same week, the furnace produced 19,829 pounds of bullion, or nine tons and 1,829 pounds. In fact, it is thought that there has not been a single instance in our district, where a furnace has been started and handled more successfully; especially, if we consider the fact the machinery and everything in connection with the works was new and untried. Our informant thinks that some one should at least be credited with good judgment, for the production of these evident results.—*Eureka Sentinel.*

More than £550,000,000 are invested in railways in Great Britain and Ireland.

Pierre Blot on Gravies.

Among the very important articles which the cook prepares, there are none more important than the gravies which aid to render the meats palatable when placed upon the table. Most of our cooks have an idea that a little melted fat and some burned or raw flour stirred in, makes a wonderful gravy. But they don't. They never did. A gravy should add to the flavor of the meat, and should heighten it, and render the meat more savory; common gravies generally do the contrary. Listen to the Professor:

A cook is not more immaculate than any one else, and has the most difficult task in any, no matter what profession or trade. A chemist may begin and finish his work at any time; it is the same with the carpenter. A metal-worker must strike when his metal is hot and ready to work, but he does it—that is, heats it—at any time he chooses. A cook cannot select his or her time to work; the work has to be done at a precise time, and must be finished in spite of any mishap, at a precise time. If the work is accelerated, it may take away part of the flavor of the dish prepared. The same result will follow if the work happens to be done too slowly. Many excellent dishes are spoiled by not being served at the proper time. Everybody knows the difference between a steak served directly from the gridiron and one that has been kept in oven for a short time.

As a gravy is indispensable to roast meat, we will tell our readers how to make it. The best meat is generally fat, especially a joint, a turkey or a chicken, etc.; therefore, when the meat is roasted, there is scarcely any liquid but fat left in the pan. As fat must not be served, the joint or bird is dished and put in the oven, the door of which is left open; all the fat is turned off the pan, broth is put in it instead, and the pan is placed over the fire. Take a wooden spoon, stir gently all over the bottom of the pan, give one hoil, turn the contents over the joint through a strainer, and serve. You then have a gravy that deserves that name, and not a greasy, muddly substance, as uninviting to the eye as it is to the palate.

On meeting Dr. Dixon, one day, he accosted me smilingly, saying, "Blot, my wife engaged a new cook yesterday, a very queer cook; she took me for a chicken, and put flour in my gravy." The digestive apparatus of man was not made to digest raw flour. When flour is used in the composition of a sauce, it must first be properly cooked.

Broth is easily and cheaply made. A careful cook will get almost enough to make as rich broth as is necessary for the soup, sauces and gravies, in the trimmings of hasting pieces, the bones of roasted joints of beef and veal that are generally left on the dish, and the bones of turkeys and chickens. When there is not enough of the above, a pound or two of beef, according to the size of the family, may be bought to make the broth. The pieces for soup are either from the shin, leg or chuck piece, and must be fresh. The broth-kettle, or digester, is placed on the fire with the water and meat in it, and the scum skimmed off carefully as soon as it collects on the surface. After being skimmed, the vegetables are put in, and then it is simmered (not boiled) for five or six hours. Every green-grocer knows the vegetables necessary to season broth. When done, it is strained, the fat that floats on the top is removed by means of a ladle or large spoon, and it is ready for use. In England they call broth, stock. In the kitchens of English lords and other rich families, there is a large pot or kettle on the corner of the fire, in which the broth is made; it is there all the time, from morning till evening, and used for all cooking purposes. Hence the word stock given to it.—*Harper's Bazar.*

GRAHAM ROLLS.—Take cold Graham pudding, mix in either Graham or white flour until you have a stiff dough; when thoroughly mixed, cut in pieces of an equal size, take one piece at a time, sprinkle well with fine flour, roll in the hands patting the ends to keep them even until you have a roll three or four inches long and 1½ thick, lay them on a platter or moulding board, have the oven the right heat, not quite as hot as for water gems—but about right for milk gems—wing off the grate, lay them about one inch apart. If baked right they will be a light brown, and light enough to crack open. Corn meal pudding can be used in the same way by working Graham, white or rye flour. This is very convenient for those who have not the cast-iron bread pans.

SAUSAGE MEAT.—If you want it extra nice, take two nice fresh hams and one shoulder; take off the skin and have it chopped nicely, season it with salt, pepper, sage, and a little sugar. If you like spiced meats, use with that a few cloves, some mace and nutmeg. Keep it in a dry, cool place, and fry it in balls, or stuff the skins when you first make it for dried sausages.

A GOOD AND SIMPLE CURRY POWDER.—One of our Boston druggists sends us the following recipe for curry powder, which is not only much simpler than the ones usually given, but has been endorsed as excellent by persons who have been familiar with the condiment as prepared in the East Indies: "Mix one ounce of Cayenne pepper, four ounces anise, and two pounds tumeric."

Laws Under New California Code—Taking Effect Jan. 1, 1873.

Formation of Corporations.

[Corporation Defined.]

233. A corporation is a creature of the law, having certain powers and duties of a natural person. Being created by the law, it may continue for any length of time which the law prescribes.

[What are public and private corporations.]

234. Corporations are either public or private. Public corporations are formed or organized for the government of a portion of the State; private corporations are formed for the purposes of religion, benevolence, education, art, literature, or profit.

[Corporations, how formed.]

235. Private corporations may be formed by the voluntary association of any five or more persons, for this purpose and in the manner prescribed in this Article. A majority of such persons shall be citizens of this state. Married women may become corporators, officers and members of religious, benevolent, art, literary, or educational corporations.

[For what purpose private corporations are formed.]

236. The purposes for which private corporations may be formed are the following, and none other:

1. Fire, marine, life, health, accident insurance;
2. The insurances of the lives of domestic animals;
3. Construction, conduct, and maintenance of railroads and telegraph lines in connection therewith;
4. Construction, conduct, and maintenance of street railroads, plank roads, turnpikes, common wagon roads;
5. Construction, conduct, and maintenance of bridges, ferries, wharves, chutes, piers;
6. The establishment, conduct and maintenance of express or stage lines.
7. Constructing, conducting, and maintaining telegraph lines;
8. Constructing and maintaining canals for navigation, and canals and ditches for drainage, agricultural, or mining purposes;
9. For navigating the ocean, or any of the waters of this State, with vessels propelled by sails, or in whole or in part by steam;
10. The purchase of lands for, and the distribution of homesteads;
11. The accumulation of funds for the purchase of real property, and for the erection of buildings and improvements thereon, for the benefit of the members thereof.
12. Accumulating savings and loaning the funds of the members thereof;
13. Manufacturing, mining, mercantile, mechanical, wharfing, docking, or other purposes, or for engaging in any other species of trade, business or commerce;
14. The transacting of a printing and publishing business;
15. To supply water to the public;
16. The manufacture and supply of gas, or the supply of light or heat to the public by any other means;
17. The establishment, conduct, and maintenance of hotels, laundries or theaters;
18. For the formation, conduct, and maintenance of District and County Agricultural Fairs;
19. The encouragement of, or business of, agriculture, horticulture, or stock-raising.
20. The improvement of the breed of domestic animals;
21. The support, conduct, and maintenance of colleges of learning, or for any literary or scientific object, or for the promotion of any of the sciences or fine arts;
22. Acquiring, preserving, and conducting public libraries.
23. The organization and conduct of Chambers of Commerce, Boards of Trade, and Mechanic Institutes.
24. The support, conduct, and maintenance of homes and schools for orphans and foundlings, or either of them, or any person otherwise destitute;
25. For the purposes of religion, sociability, charity or learning;
26. The purchase of lands for and the maintenance of cemeteries.
27. For banks of discount and deposit.

[How corporations may continue their existence under this Code.]

237. Any existing corporation formed under any law of this State, for any purpose designated in any subdivision of the preceding section, may, at a meeting of its members or stockholders, called for that purpose, continue its existence, under Title I of this Part, or under the provisions of any subsequent Title particularly applicable thereto, as follows:

1. Public notice of such meeting, and of its object, must be given by publishing the same in a daily newspaper for two weeks, or a weekly newspaper for four weeks, successively, published in the county where the principal place of business of the corporation is. In lieu of the publication personal notice may be given to each member or stockholder thereof;
2. Two-thirds of the members if there is no capital stock, and if there is a capital stock, then stockholders representing two-thirds of it, must vote in favor of such continuance;
3. A copy of the proceedings of this meeting, giving the names of all persons present, the votes taken, the notice calling the meeting, and the proof of its publication or service, all duly certified by the President and Secretary of the corporation, must be filed in the offices of the Secretary of State and Clerk of the county where the articles of incorporation are on file. Thereafter such corporation is possessed of all the rights and powers, and subject to all the obligations, restrictions, and limitations provided in this Part applicable thereto, and its corporate existence is continued.

[Existing corporations not affected.]

238. No corporation formed or existing before twelve o'clock, noon, of the day upon which this Code takes effect, is affected by the provisions of Part IV of Division First of this Code, unless such corporation elects to continue its existence under it as provided in Section 237; but the laws under which such corporations were formed and exist are applicable to all such corporations, and are repealed, subject to the provisions of this section.

[Name of instrument creating corporation.]

239. The instrument by which a private corporation is formed is called "articles of incorporation."

[Articles of incorporation, what to contain.]

240. Articles of incorporation must be prepared, setting forth:

1. The name of the corporation;
2. The purpose for which it is formed;
3. The place where its principal business is to be transacted;
4. The term for which it is to exist, not exceeding fifty years;
5. The number of its Directors or Trustees, and the names and residence of those who are appointed for the first year;
6. The amount of its capital stock, and the number of shares into which it is divided;
7. If there is a capital stock, the amount actually subscribed, and by whom.

[Certain Corporations to state further facts in articles.]

241. The articles of incorporation of any railroad, wagon road, or telegraph organization must also state:

1. The kind of road or telegraph intended to be constructed;
2. The place from and to which it is intended to be run, and all intermediate branches;
3. The estimated length of the road or telegraph line;
4. That at least ten per cent. of the capital stock subscribed has been paid in to the Treasurer of the intended corporation.

[To be continued.]

Last month Salt Lake City received 14,000 tons of freight by the Utah Central, which connects the city with the Pacific roads.

The naphthalization of air, to convert it into an illuminating gas, was the invention of an English chemist in 1847.

Business Cards.

H. O. BENNETT,
STATISTICIAN.
Reports and estimates made at all departments of
Production, Commerce, and Manufacture, of the Pacific
Coast. 3v24-1f

AMOS HOWMAN,
Mining and Topographical Engineer.
No. 637 Kearny Street, near Clay. Residence, 17 Rondel
Place (Mission and 16th). sc19

RICHARD H. STRETCH, Civil Engineer,
City and County Surveyor.

Office—Room 16, City Hall. 11v24-3m

GILLES H. GRAY. JAMES M. HAYES.

GRAY & HAVEN,
ATTORNEYS AND COUNSELORS AT LAW,
In Building of Pacific Insurance Co., N. E. corner Cal-
ifornia and Loldesford streets,
SAN FRANCISCO

JOHN ROACH, Optician.
429 Montgomery Street,
S. W. corner Sacramento.
Surveying Instruments made, repaired and adjusted
2v17-3m

N. P. LANGLAND,
Stair Builder, Wood Turner, and
SCROLL SAWYER.

No. 485 Brannan Street.....SAN FRANCISCO.
And No. 9 Q St., bet. First and Second,
SACRAMENTO. 21v23-1f

W. BARTLING. **HENRY SIMBALL.**
BARTLING & KIMBALL,
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505 Clay street, (southwest cor. Sansome),
15v12-3m SAN FRANCISCO.

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CORDE COMPANY.

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Line constantly on hand. Tanned Manila Mining Ropes
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DR. ABORN,
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FOR CHRONIC DISEASES,
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Diseases of a chronic and obstinate character, espe-
cially such cases as have for years, or a lifetime, resisted
the ordinary modes of treatment, are the class of mal-
adies in the treatment of which Dr. Aborn has become
pre-eminent on the Pacific Coast, as well as throughout
the Union, and by his success has achieved for him-
self an enviable reputation. 23v25-1y

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LEAD MILLS, Blackfriars Road, London, England.
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Packets, 3d each time, 6d, 1s, 2s, 3d, and 4s each.
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BOARDS from 1s. 6d. each.
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tro-plating, Plate-glass, Marble, etc. Tablets, 6d each.
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OAKEY'S EMERY AND GLASS CLOTH.
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BLACK LEAD, etc.
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gists, etc. 21v25-1y

\$1,000 REWARD! For any case of
Blind, Bleeding, Itching, or Ulcerated
Piles that **Do King's Pile**
Remedy fails to cure. It is pre-
pared expressly to cure the Piles and nothing else. Sold by
all Druggists. Price \$1.00.
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Ransome's Patents,

For which Commissioners for the International Exhi-
bition of 1862 awarded the Prize Medal, and Gold
Medal at the Mechanics' Institute Fair, 1871, of San
Francisco.

The Pacific Stone Company call the especial attention
of Architects, Engineers and the public in general, to
the SUPERIOR QUALITY of the Stone now being man-
ufactured by them in this city under the Ransome
Patents. They make to order and keep in stock:

Building Fronts, Water Pipe

Sinks, Monuments, Fountains,

Tiles, Copings for Walls,

Filters, etc., etc.,

Together with Ransome's Celebrated Free-Grit Grind-
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price far below that of hand-cut work.

The attention of private parties intending to build is
respectfully solicited.

Office, No. 10 BUSH STREET, San Francisco.

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The attention of the Medical profession is respect-
fully called to the following preparation of this new reme-
dial agent. Eucalyptus and its preparations have been
found useful inobstant cases of intermittent and Marsh
Fever, often supplanting the use of Quinine. The
paroxysms of Asthma and Catarrh are greatly controlled,
and in various Kidney diseases and Catarrh of the Blad-
der it seems to act like a specific.

FLUID EXTRACT EUCALYPTUS.

This extract represents in a concentrated form the
medicinal effects of the leaves of Eucalyptus Globulus
THE ELIXIR OF EUCALYPTUS.

This compound presents the properties of the leaves
in a palatable form and elegant appearance. Dose—
One tablespoonful, to be repeated as often as the case
demands.

Cigarettes of Eucalyptus Globulus, useful in
Asthma, Difficulty of Breathing, Incipient Pleurisy, etc.
Prepared and sold by JAMES G. SUEBLE & CO.,
Chemists and Apothecaries,

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"Clear as Crystal."

TRY THEM.

They Have No Equal

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Persons in the country can be suited with the BRA-
ZILLIAN PEBBLE SPECTACLES by forwarding one of
their old glasses in a letter; or, if they have never worn
glasses, they will please state the fact, and age, health,
etc. Ordinary glasses to suit all sights can be procured
in the same manner. 15v4-3m-awbp

Betts's Capsule Patents.

To prevent infringements, notice is hereby given, that
Betts's name is on every Capsule he makes for the principal mer-
chants in England and France,
thus enabling vendor, purchaser, and consumer not only to
identify the genuineness of the capsule, but likewise
the contents of the vessel to which it is applied.
The LORD CHANCELLOR, in his judgment, said that the
capsules are not used merely for the purpose of the ornament,
but that they are serviceable in protecting the wine
from injury, and insuring its genuineness.
MANUFACTORIES:—1, WINE-ROAD, CITY-ROAD, LON-
DON, AND BORNEAU, FRANCE.

Metallurgy and Ores.

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COMMISSION MERCHANTS

ADVANCES MADE

On all kinds of Ores, and particular attention

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G. W. STRONG.

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Metallurgical Works,

No. 10 Stevenson Street, near First, SAN FRANCISCO

We purchase Ores, Bullion, etc. Ores worked and
Tests made with care. Also, Assays of Gold, Silver,
Copper, Lead, Tin and other Metals. 23v22tf

LEOPOLD KUH,

(Formerly of the U. S. Branch Mint, S. F.)

Assayer and Metallurgical
CHEMIST,

No. 611 Commercial Street,

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No. 512 CALIFORNIA STREET,
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J. A. MARS, Assayer.

Analysis of Ores, Mineral Waters, etc. 10v2f

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IMPORTERS OF AND DEALERS IN

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Chemical Apparatus and Chemicals,

Druggists' Glassware and Sundries,

PHOTOGRAPHIC GOODS, ETC.,

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We would call the special attention of Assayers
Chemists, Mining Companies, Milling Companies
Prospectors, etc., to our large and well adapted stock o

ASSAYERS' MATERIALS

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Chemical Apparatus,

Having been engaged in furnishing these supplies since

the first discovery of mines on the Pacific Coast.
Our Gold and Silver Tables, showing the value
per ounce Troy at different degrees of fineness, and val-
uable tables for computation of assays in Grains a
Grammes, will be sent free upon application.

7v25-1f

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Important to Miners and Mill Men.

Silver-Plated Copper Amalgamating Plates,
for Saving Gold.



Of all sizes and in any quantity, furnished to
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Particular attention given to plating goods for
Builders, Plumbers, etc. Hotel and Restaurant
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SAN FRANCISCO GOLD AND SILVER PLATING WORKS,
655 Mission street, San Francisco.

2v25-3m **E. G. DENNISTON,** Proprietor.

To Mill Men and Miners.

I am now manufacturing

CYANIDE OF POTASSIUM,

Which I can sell upon better terms than any other
dealer on the Pacific Coast.

I make three grades or qualities to suit the require-
ments of different consumers.

I will be glad to furnish prices to any person ad-
dressing me on the subject.

HENRY G. HANKS,

Manufacturing Chemist,

PACIFIC CHEMICAL WORKS, SAN FRANCISCO

24v25-1f

Varney's Patent Amalgamator.

These Machines Stand Unrivaled.

For rapidly pulverizing and amalgamating ores, they
have no equal. No effort has been, or will be spared
to have them constructed in the most perfect manner
and of the great number now in operation, not one has
ever required repairs. The constant and increasing de-
mand for them is sufficient evidence of their merits.
They are constructed so as to apply steam directly
into the pulp, or with steam bottoms, as desired.

This Amalgamator Operates as Follows:

The pan being filled, the motion of the muller forces
the pulp, to the center, where it is drawn down through
the aperture and between the grinding surfaces.—
Thence it is thrown to the periphery into the quicksilver.
The curved plates again draw it to the center, where it
passes down, and to the circumference as before. Thus
it is constantly passing a regular flow between the grind-
ing surfaces and into the quicksilver, until the ore is
reduced to an impalpable powder, and the metal amal-
gamated.

Sellers made on the same principle excel all others.
They bring the pulp so constantly and perfectly in con-
tact with quicksilver, that the particles are rapidly and
completely absorbed.

Mill-men are invited to examine these pans and settlers
for themselves, at the office, 229 Fremont Street,
San Francisco

Richardson & Co., Copper Ore Wharves,
SWANSEA.

RICHARDSON & Co. have been for thirty years established
in Swansea as Agents for the preparation, Sampling, Assay-
ing, and Sales of Copper, Silver, Gold, Lead, Zinc, and al-
other Ores and Metals, for which they have extensive Ware-
houses and Wharves under cover, 1,000 feet of Quay Front-
age within the Floating Dock, and the most complete Ma-
chinery and Appliances. They are also prepared to make
advances against Ores in anticipation of realization, and to
guarantee all payments when required. 17v21-1y

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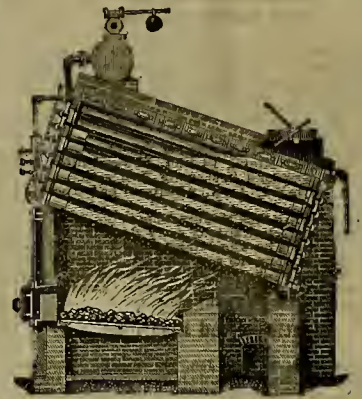
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Root's Safety Boilers.



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ALL SORTS OF STEAM BOILERS

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BOILER MAKERS

AND GENERAL MACHINISTS,

Howard st., between Fremont and Beale, San Francisco.

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PIONEER

Meerscham Pipe Manufacturer,



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The first and only Manufactory on the Pacific Coast.
MEERSCHAUMS MOUNTED WITH SILVER. Meerscham
Pipes Bored and Repaired. Amber Mouth-pieces Fitted.

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CELEBRATED

Worcestershire Sauce.



Declared by Connois-
seurs to be the only good
SAUCE

Caution Against Fraud.

The success of this most
delicious and unrivaled
Condiment having caused certain dealers to
apply the name of "Worcestershire Sauce"
to their own inferior compounds, the public
is hereby informed that the only way to
secure the genuine is to ask for LEA &
PERRINS' SAUCE, and see that their names
are upon the wrapper, labels, stopper and
bottle.

Some of the foreign markets having been
supplied with a spurious Worcestershire
sauce, upon the wrapper and labels of which the names
of Lea and Perrins have been forged, L. and P. give
notice that they have furnished their correspondents
with power of attorney to take instant proceedings
against manufacturers and vendors of such, or any
other imitations by which their right may be infringed.
Ask for LEA & PERRINS' SAUCE, and see name on
wrapper, label, bottle and stopper.

Wholesale and for export by the Proprietors, Worces-
ter; Croese & Blackwell, London, &c., &c., and by
Grocers and Oilmen universally. 15v24-1f

BUY BARBER'S [BT] BRAOE

PATENTS & INVENTIONS.

Telegraphic List of U. S. Patents Issued to Pacific Coast Inventors.

REPORTED OFFICIALLY FOR THE MINING AND SCIENTIFIC PRESS, DEWEY & CO., PUBLISHERS AND U. S. AND FOREIGN PATENT AGENTS.

By Special Dispatch, Dated Washington, D. C., Jan. 21st, 1873.

FOR WEEK ENDING JANUARY 7th, 1873.

BUTTON-HOLE ATTACHMENT FOR SEWING-MACHINES.—Eugene Moreau, S. F., Cal.
HANGING-DOORS.—Godfrey Heegler, S. F., Cal.
TRACK-CLEANER.—Andrew J. Gove, S. F., Cal.
PHOTOGRAPHIC PLATE-HOLDER.—Joseph Buchtel, Portland, Og.
LUBRICATOR.—John M. Power, Port Discovery, Washington Ter.
WASHING-MACHINE.—Amandrin M. Olds, Greeley, Colorado Ter.

New Incorporations.

AMERICAN MILL MANUFACTURING CO.—Jan. 16. Object: To manufacture woolen and cotton goods of every description, also machinery, castings and iron work of every description for the manufacture of the same. Capital stock, \$500,000, in shares of \$500 each. Trustees—Thos. H. Reynolds, Wm. B. Smith, Robert A. Marden, John H. Harney and Thomas Penman.

SAN RAFAEL COPPER AND SILVER M. CO.—Jan. 22. Location: San Rafael Mining District, Lower California. Capital stock, \$3,000,000, in shares of \$100 each. Trustees—S. A. Raymond, A. A. Albertson and Thomas Rogers.

PACIFIC AMERICAN SILK MANUFACTURING CO.—Jan. 18. Object: To manufacture silks of every description and fineness, and goods in whose fabric silk forms a constituent element, from the raw material, foreign or domestic. Capital stock, \$500,000, in shares of \$100 each. Trustees—Joseph Godchaux, E. Gauthier, Edward Martin, Gustave Touchard, Phillip Mesgher.

Meetings and Elections.

KNICKERBOCKER M. CO.—Jan. 17. Trustees—Robert Sherwood, W. F. Myers, J. E. de la Montagne, O. Dickinson, Jr., and John O. Hanson. Following is a statement of the Company for the fiscal year, ending on the third Friday in January, 1873:

Receipts—Balance cash on hand, January 19th, 1872, date of the last annual meeting, \$7,057.42; receipts from January 19th, 1872, to date, \$56,031.52. Total, \$73,088.94. Disbursements—For the year ending January 17th, 1873, including erection of hoisting works, \$59,386.33. Balance cash in Treasury, \$13,702.61.

Assets—Cash on hand, \$13,498.61; hoisting works and buildings, valued at \$13,498.61. Total assets, \$27,200.77. Liabilities—Labor and materials due at mine to date, \$1,500.

Surplus over all liabilities, \$25,700.77.

PACIFIC QUARTZ MINING COMPANY. Jan. 17. Trustees—E. J. Wilson, G. Palache, C. E. McLane, C. Hartson and S. Brown. The Trustees subsequently elected the following officers: E. J. Wilson, President; G. Palache, Vice-President; C. E. McLane, Treasurer; E. Wheaton, Secretary.

INCREASE OF CAPITAL STOCK—KENTUCK M. CO.—Jan. 16. Increase of capital stock from \$400,000 to \$500,000.

LYNN M. & M. CO.—Jan. 16. Capital stock increased from \$2,000,000 to \$3,000,000.

ST. PATRICK G. M. CO.—Jan. 22. Capital stock increased from \$500,000 to \$2,000,000.

Leather Market Report.

(Reported for the Press by Dolliver & Co.)

SAN FRANCISCO, Wednesday, Jan. 22, 1873. The price of sole leather continues the same. French stocks have advanced 5 per cent, and importers are firm in their prices.

Sheep Skin, 10 to 12 lbs. per doz.	25 00	25 00
Santa Cruz Leather, 10 to 12 lbs. per doz.	25 00	25 00
Country Leather, 10 to 12 lbs. per doz.	25 00	25 00
Stockton Leather, 10 to 12 lbs. per doz.	25 00	25 00
Reddish 8 Kil, per doz.	65 00	85 00
Jodot, 11 to 15 Kil, per doz.	55 00	70 00
Jodot, second choice, 11 to 15 Kil, per doz.	55 00	70 00
Leather, 15 to 18 Kil, per doz.	75 00	75 00
Leather, 18 to 20 Kil, per doz.	85 00	85 00
Correllian, 15 to 18 Kil, per doz.	65 00	65 00
Correllian, 18 to 20 Kil, per doz.	65 00	65 00
Correllian, Leather, 14 to 16 Kil, per doz.	65 00	70 00
Oregon Cal, 10 to 12 lbs. per doz.	50 00	50 00
Simon, 18 Kil, per doz.	60 00	60 00
Simon, 20 Kil, per doz.	65 00	65 00
Simon, 24 Kil, per doz.	75 00	75 00
Robert Alf, 7 and 8 Kil, per doz.	55 00	40 00
French Kips, 10 to 12 lbs. per doz.	1 00	1 30
California Kip, 10 to 12 lbs. per doz.	55 00	70 00
French Sheep, 10 to 12 lbs. per doz.	65 00	15 00
Eastern Cal for Backs, 10 to 12 lbs. per doz.	1 10	1 25
Sheep Rooms for Topping, all colors, 10 to 12 lbs. per doz.	9 00	13 00
California Russell Sheep Linings, 10 to 12 lbs. per doz.	5 00	10 00
Best Jodot Cal Boot Legs, 10 to 12 lbs. per pair.	5 25	5 50
Good French Cal Boot Legs, 10 to 12 lbs. per pair.	4 50	5 00
French Cal Boot Legs, 10 to 12 lbs. per pair.	4 00	4 50
Harness Leather, 10 to 12 lbs. per pair.	4 00	5 00
Pair Bridle Leather, 10 to 12 lbs. per doz.	45 00	72 00
Stirring Leather, 10 to 12 lbs. per doz.	24 00	37 00
Walt Leather, 10 to 12 lbs. per doz.	30 00	50 00
Buff Leather, 10 to 12 lbs. per doz.	18 00	30 00
Wax Side Leather, 10 to 12 lbs. per doz.	20 00	22 00
Eastern Wax Leather, 10 to 12 lbs. per doz.	25 00	25 00

San Francisco Metal Market.

PRICES FOR INVOICES.

Jobbing prices rule from ten to fifteen per cent. higher than the following quotations.

WEDNESDAY, Jan. 22, 1873.	
IRON.	
Scotch Pig Iron, 10 to 12 lbs. per ton.	\$50 00 @ 55 00
White Pig, 10 to 12 lbs. per ton.	50 00 @ 55 00
Refined Bar, good assortment, 10 to 12 lbs. per ton.	— @ —
Refined Bar, good assortment, 10 to 12 lbs. per ton.	— @ —
Boiler, No. 1 to 4.	05 00 @ 06 00
Plate, No. 5 to 9.	06 00 @ 07 00
Sheet, No. 10 to 20.	07 00 @ 08 00
Sheet, No. 24 to 27.	08 00 @ 09 00
Horse Shoes.	9 00 @ —
Nail Rod.	10 00 @ —
Norway Iron.	9 00 @ —
Roller Iron.	10 00 @ —
Other Irons for Blacksmiths, Miners, etc.	5 00 @ 6 00
COPPER.	
Braziers.	45 00 @ 48 00
Copper Tin.	50 00 @ —
O. S. & Pat.	55 00 @ —
Sheathing, 10 to 12 lbs. per doz.	35 00 @ 45 00
Sheathing, Yellow.	33 00 @ 40 00
Sheathing, Old Yellow.	30 00 @ 33 00
Composition Bolts.	25 00 @ 30 00
TIN PLATES.	
Plates, Charcoal, 10 to 12 lbs. per box.	17 00 @ —
Plates, 10 to 12 lbs. per box.	14 00 @ —
Roofing Plates.	14 00 @ —
Banca Tin, Slabs, 10 to 12 lbs. per box.	45 00 @ —
Sheet, English Cast, 10 to 12 lbs. per box.	20 00 @ 22 00
Drill.	20 00 @ —
Flat Bar.	20 00 @ —
Blanch Point.	16 00 @ 17 00
Russell.	12 00 @ 14 00
ZINC.	10 00 @ 11 00

A Good Binder for \$1.50.

Subscribers for this journal can obtain our Patent Elastic Newspaper File Holder and Binder for \$1.50—containing gut title of the paper on the cover. It preserves the papers completely and in such shape that they may be quickly fastened and retained in book form at the end of the volume, and the binder (which is very durable) used continuously for subsequent volumes. Post paid, 25 cts. extra. It can be used for Harper's Weekly and other papers of similar size. If not entirely pleased, purchasers may return them within 30 days. Just the thing for libraries and reading rooms, and all who wish to file the Press. 1 amp

EVERY MECHANIC should read and familiarize himself with "Brown's 507 Mechanical Movements," illustrated, published and sold by Dewey & Co., Mining and Scientific Press office, S. F. Bound in cloth. Price, (very low) post paid, \$1, coin, or its equivalent in currency. Inventors, Engineers, Students, and Apprentices will find it exceedingly useful and especially handy for reference.

A NEW BOOK ON MINING.

The Explorers', Miners' and Metallurgists' Companion; Comprising a Practical Exposition of the Various Departments of Exploration, Mining, Engineering, Assaying, and Metallurgy. The Most Practical and Comprehensive Work on Mining Subjects Extant. Comprising 640 Pages, and 81 Engravings. By J. S. Phillips, M. E. Price, bound in cloth, \$10 (in coin); in leather, \$12. Forwarded by mail, in cloth, \$11.40; in leather, \$13.75. Issued and for sale by DEWEY & CO., Patent Agents and Publishers Mining and Scientific Press, S. F.

SEND FOR THE NEW YORK ARGUS, an illustrated, independent Democratic Newspaper, devoted to Choice Literature, Romance, News, Fashions, Agriculture, Horticulture, Arts, Science, Finance and Commerce. Subscription price, \$2.00 per annum, in advance. Prospectus and sample numbers FREE. All communications should be addressed to C. F. STYLES, Publisher, Post Office box, 5, 165 New York.

PACIFIC MINERAL LAND OFFICE—HOYT, SEARS & McKEE—MERCHANTS' EXCHANGE, CALIFORNIA STREET, SAN FRANCISCO, CAL.—Mining Patents obtained for claims in California, Nevada, Utah, Arizona, and elsewhere. Plans and papers prepared for adverse claimants, as required by the new law; relocations effected where claims have lapsed under the Congressional Act of May 10, 1872; Mining Contests conducted before the Departments and Courts.

Mr. McKee's experience as Chief of the Mining Claims Division, General Land Office, Washington, D. C., will be valuable to parties desiring to properly appear either as claimants for patents or as adverse claimants. Cases attended to in person at any of the District Land Offices, or at the Departments at Washington, where deemed necessary. JAS. T. HOYT, W. H. SEARS, O. H. McKEE. 1725-3m

WONDERFUL CURE.—A young man, a resident of this city, gives us the facts of the following remarkable cure. He says: "I suffered with Catarrh in its worst form. Bones came from my nose; my breath became offensive; I was compelled to eat alone. I had given up all hopes of being cured. At this time met Dr. E. W. E. of Chicago, who had been cured by a remedy discovered by himself. I tried the remedy, with little faith; but at the end of three months found myself cured." Our informant has now associated himself with the discoverer in the manufacture of the article, which will be known under the name of the Diamond Catarrh Remedy. Price 50 cts.; sent by mail for 60 cts. A. F. EVOY & CO., No. 9 Post street, San Francisco. Sold by all druggists. 26725-3m

CONTINENTAL LIFE INSURANCE CO., No. 302 Montgomery street, corner of Pine.

Agents Wanted for the New Book,

Underground Treasures—How and Where to Find Them,

A KEY FOR THE READY DETERMINATION

Of all the Useful Minerals within the United States.

BY JAMES ORTON, A. M.

A work of rare value to every person, and worth in times its cost. Price only \$1.50.

Send for full descriptive circular to

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ROCKY Greatest Weekly Newspaper of the Great West. Fifteenth year. Advertisements 40 columns. init. Send \$3 per year. stamp for specimen copy to WM. N. BYERS, DENVER, COLORADO.

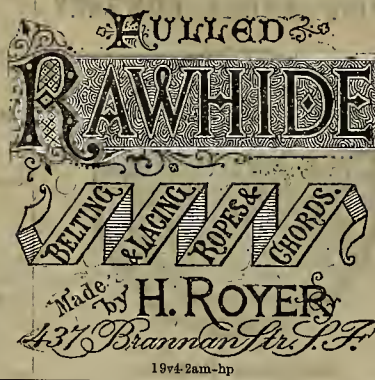
Amazon Silver Mining Company—Location

of works, Ely District, Lincoln County, Nevada. Notice is hereby given, that at a meeting of the Board of Trustees, made on the 22d day of October, 1872, the several amounts set opposite the names of the respective shareholders as follows:

Names.	No. Certificate.	No. Shares.	Amount.
H. McPherson, Trustee...	2	50	\$ 5 00
H. McPherson, Trustee...	3	50	5 00
H. McPherson, Trustee...	4	50	5 00
H. McPherson, Trustee...	5	50	5 00
H. McPherson, Trustee...	6	50	5 00
H. McPherson, Trustee...	7	50	5 00
H. McPherson, Trustee...	8	50	5 00
H. McPherson, Trustee...	9	50	5 00
H. McPherson, Trustee...	10	100	10 00
H. McPherson, Trustee...	11	50	5 00
H. McPherson, Trustee...	12	500	50 00
H. McPherson, Trustee...	13	2546	254 60
H. McPherson, Trustee...	14	2546	254 60
H. McPherson, Trustee...	15	2546	254 60
H. McPherson, Trustee...	16	2546	254 60
H. McPherson, Trustee...	17	2546	254 60
H. McPherson, Trustee...	18	2546	254 60
H. McPherson, Trustee...	19	2546	254 60
H. McPherson, Trustee...	20	2546	254 60
H. McPherson, Trustee...	21	2546	254 60
H. McPherson, Trustee...	22	2546	254 60
H. McPherson, Trustee...	23	450	45 00
H. McPherson, Trustee...	24	1273	127 30
H. McPherson, Trustee...	25	1272	127 20
H. McPherson, Trustee...	26	1272	127 20
H. McPherson, Trustee...	27	1272	127 20
H. McPherson, Trustee...	28	1496	149 60
H. McPherson, Trustee...	29	500	50 00
H. McPherson, Trustee...	30	500	50 00
H. McPherson, Trustee...	31	500	50 00
H. McPherson, Trustee...	32	500	50 00
H. McPherson, Trustee...	33	250	25 00

And in accordance with law, and an order of the Board of Trustees, made on the 22d day of October, 1872, so many shares of each parcel of said stock as may be necessary, will be sold at public auction, at the office of the Company, No. 502 Sacramento street, San Francisco, California, on the fourteenth day of February, 1873, at the hour of 1 o'clock, a. m. of said day, to pay said delinquent assessment thereon, together with costs of advertising and expenses of sale.

M. J. McMANUS, Secretary pro tem. Office, 509 Sacramento street, San Francisco, California. ja25



HALLIDIE'S PATENT ENDLESS WIRE ROPEWAY.

Covered by Numerous U. S. Patents.

IMPORTANT TO

Mining Companies, Civil Engineers, Contractors, etc.

The system of transporting material, such as Ores, from the mine to the mill, Earths for embankments, Rock from quarries, etc., by means of steel wire rope, has been well tested and found more economical, advantageous and reliable than any other method of transportation; and to the annexed certificates in connection therewith I beg to call the attention of those interested:

EUREKA, Nevada, July 10, 1872.

T. M. MARTIN—My dear Sir: On your leaving for San Francisco, it gives me great pleasure to hand you my written acceptance of the HALLIDIE TRAMWAY put up by you upon our mine in Freiburg.

It is a perfect success, discharging ten tons of ore per hour with two men's labor. It is perfectly simple in construction, and as far as I can judge, there is nothing about it to ever get out of order—nothing to wear out. While ours requires but about two thousand five hundred feet of wire rope, I can see no reason why the line could not be extended almost indefinitely with equally happy results. Again, the carrying capacity might be doubled or quadrupled if desired. After several weeks' trial upon our mine, the unanimous verdict of all who have seen it is a complete and most successful one. If this can be of any service to you, use it in any way you think proper. Very respectfully, C. C. GOODWIN.

EMMA HILL CONSOLIDATED MINING CO.

Superintendent's Office, Sept. 28, 1872.

T. M. MARTIN, Esq.—Sir: The Ropeway constructed by you (HALLIDIE'S PATENT) for the Emma Hill Consolidated Mining Company, has been in operation for some time, and in a most satisfactory manner, and is at this time in splendid working condition. I most cheerfully accept the work for the Company, and recommend it to others wishing a sure and speedy transit for ore or other places impracticable for wagon roads, etc. Respectfully, L. W. GOLDBATH, Superintendent.

EMMA HILL CONSOLIDATED MINING CO.

Superintendent's Office, Oct. 28, 1872.

T. M. MARTIN, Esq.—Sir: With pleasure I testify to the fact that the Emma Hill Ropeway (HALLIDIE'S PATENT) built by you for this Company, has been in operation for some time, and in a most satisfactory manner, and is at this time in splendid working condition. I most cheerfully accept the work for the Company, and recommend it to others wishing a sure and speedy transit for ore or other places impracticable for wagon roads, etc. Respectfully yours, WM. C. CAMPBELL, Clerk of Co.

The Vallejo Ropeway.

The Vallejo Tunnel Company's Tramway in Little Cottonwood, built on the HALLIDIE PATENTED PLAN, is a complete success. It is between 3,000 and 4,000 feet in length, and is supported by thirteen stations. The fall in the distance is about 600 feet, and the wire rope, which is three-fourths of an inch in diameter, will safely and easily deliver one hundred tons in six hours. The machinery is automatic, loading and unloading the sacks or buckets. About one t and a half can be sent down at one time. The stations are about two hundred feet apart, and the entire apparatus is strong and safe. The wire rope is elevated about forty feet above the surface of the hill, the Tramway can be worked all winter long, without the slightest trouble.—Utah Mining Journal, Salt Lake, Sept. 23, 1872.

Mining Companies and others desiring to negotiate for the erection of this system of Ropeway, can communicate with me personally, or by letter, Postoffice Box 942. HALLIDIE, Patentee, 112 and 114 California Street, SAN FRANCISCO.

Wire Rope for hoisting from mines, transmitting power, ship rigging, etc., of all kinds and sizes, on hand and made to order.

Wire of all kinds and descriptions, furnished at lowest rates. A. S. HALLIDIE, 112 and 114 California St.

SEVERANCE, HOLT & CO.,

MANUFACTURERS OF

Diamond-Pointed Drills

—AND—

DRILLING MACHINERY,

For Mining, Quarrying, Shafting, Tunneling, Prospecting, Draining, Grading and Submarine Blasting.

Special attention given to deep boring for testing the value of Mines; also, to boring Artesian Wells.

No. 315 CALIFORNIA STREET.

SAN FRANCISCO, CAL.

JUST PUBLISHED.

Froiseth's New Sectional, Topographical and Mineral

MAP OF UTAH.

SIZE, 40 BY 55 INCHES; SCALE, 8 MILES TO AN INCH.

Handsomely engraved on stone, colored in counties, and mounted on cloth, showing the Counties, Towns, Rivers, Lakes, Railroads, Mines and Mining Districts throughout the Territory, and all GOVERNMENT SURVEYS made to date. Price, mounted, \$8; Pocket form, \$5. Mailed to any part of the United States, on receipt of price, by A. L. BANCROFT & CO., 721 Market street, San Francisco, Cal., or by B. A. M. FROISETH, Publisher, Salt Lake City, Utah. 10725-ft

Mining and Other Companies.

Due to the time necessary to mail the present large edition of the M. & S. Press, we are obliged to go to press on the Friday evening—which is the very latest hour we can receive advertisements.

Cordillera Gold and Silver Mining Company—Location

of property, Morelos Mining District, Chihuahua, Mexico.

Notice is hereby given, that at a meeting of the Board of Trustees, made on the 21st day of December, 1872, the several amounts set opposite the names of the respective shareholders, as follows:

Names.	No. Certificate.	No. Shares.	Amount.
O. A. Hall...	251	32	\$4 80
W. Cooper...	50	52	7 80
James Wilson...	100	13	195 00
G. B. Andrews...	102	5	7 50
G. B. Andrews...	144	5	7 50
C. A. S. Hall...	250	20	3 00
H. L. A. Picob...	330	25	3 75
L. Frank (not issued)...		863	129 45
Alfred Harris...	137	5	7 50
Alfred Harris...	143	3	1 20
P. M. Kelly...	150	9	4 50
P. M. Kelly...	126	2	30
W. N. Wade...	222	50	7 50
W. N. Wade...	283	100	15 00
C. W. McLaughlin...	280	225	33 75

And in accordance with law, and an order of the Board of Trustees, made on the 21st day of December, 1872, so many shares of each parcel of said stock as may be necessary, will be sold at public auction, at the office of said Company, 321 Washington street, on Monday, the 10th day of February, 1873, at the hour of 2 o'clock, a. m. of said day, to pay said delinquent assessment thereon, together with costs of advertising and expenses of sale.

H. R. REED, Secretary. Office, 321 Washington street, San Francisco, Cal. ja2536

Eagle Quicksilver Mining Company—Location

of works, Santa Barbara County, California.

Notice is hereby given, that at a meeting of the Board of Trustees of said Company, held on the 18th day of January, 1873, an assessment of five dollars per share was levied upon the capital stock of said Company, payable immediately, in full coin of the United States, to the Secretary at his office, Room 5 and 6, No. 302 Montgomery street, San Francisco, California. Any shares upon which said assessment shall remain unpaid on Wednesday, March 19th, 1873, shall be deemed delinquent, and will be duly advertised on Saturday, March 22d, 1873, for sale at

Hardy Coal Mining Company—Location
of works, Coos County, Oregon.

Notice.—There are delinquent upon the following described stock, on account of assessment levied on the 15th day of November, 1872, the several amounts set opposite the names of the respective shareholders, as follows:

Names.	No. Certificate.	No. Shares.	Amount.
Thomas Hardy.....	7 (New)	75	\$37 50
Thomas Hardy.....	8 (New)	10	9 50
Thomas Hardy.....	18 (New)	135	77 50
Thomas Hardy.....	34 (New)	29	14 50
Thomas Hardy.....	35 (Old)	31	15 50

And in accordance with law, and an order of the Board of Trustees, made on the 10th day of November, 1872, so many shares of each parcel of said stock as may be necessary, will be sold at public auction, at the office of the Company, Room 5, No. 338 Montgomery street, San Francisco, California, on Saturday, the 18th day of January, 1873, at 11 o'clock a. m. of said day, to pay said delinquent assessment thereon, together with costs of advertising and expenses of sale.

JACOB HARDY, Secretary.

Office, Room 5, No. 338 Montgomery street, San Francisco, California. de28-31

POSTPONEMENT.—The above sale is hereby postponed until Jan. 28th, 1873, at the same hour and place. By order of the Board of Trustees.

DAVID WILLCOX, Sec'y.

Ivanhoe Silver Mining Company—Location
of works, Elko District, Lincoln County, Nevada.

Notice.—There are delinquent upon the following described stock, on account of assessment levied on the 15th day of December, 1872, the several amounts set opposite the names of the respective shareholders, as follows:

Names.	No. Certificate.	No. Shares.	Amount.
E. A. Richardson, Trustee.....	2	100	\$100 00
E. A. Richardson, Trustee.....	3	100	100 00
E. A. Richardson, Trustee.....	4	100	100 00
E. A. Richardson, Trustee.....	5	100	100 00
E. A. Richardson, Trustee.....	6	100	100 00
E. A. Richardson, Trustee.....	7	100	100 00
E. A. Richardson, Trustee.....	8	100	100 00
E. A. Richardson, Trustee.....	9	100	100 00
E. A. Richardson, Trustee.....	10	100	100 00
E. A. Richardson, Trustee.....	11	100	100 00
E. A. Richardson, Trustee.....	12	100	100 00
E. A. Richardson, Trustee.....	13	100	100 00
E. A. Richardson, Trustee.....	14	100	100 00
E. A. Richardson, Trustee.....	15	100	100 00
E. A. Richardson, Trustee.....	16	100	100 00
E. A. Richardson, Trustee.....	17	100	100 00
E. A. Richardson, Trustee.....	18	100	100 00
E. A. Richardson, Trustee.....	19	100	100 00
E. A. Richardson, Trustee.....	20	100	100 00
E. A. Richardson, Trustee.....	21	100	100 00
E. A. Richardson, Trustee.....	22	100	100 00
E. A. Richardson, Trustee.....	23	100	100 00
E. A. Richardson, Trustee.....	24	100	100 00
E. A. Richardson, Trustee.....	25	100	100 00
E. A. Richardson, Trustee.....	26	100	100 00
E. A. Richardson, Trustee.....	27	100	100 00
E. A. Richardson, Trustee.....	28	100	100 00
E. A. Richardson, Trustee.....	29	100	100 00
E. A. Richardson, Trustee.....	30	100	100 00
E. A. Richardson, Trustee.....	31	100	100 00
E. A. Richardson, Trustee.....	32	100	100 00
E. A. Richardson, Trustee.....	33	100	100 00
E. A. Richardson, Trustee.....	34	100	100 00
E. A. Richardson, Trustee.....	35	100	100 00
E. A. Richardson, Trustee.....	36	100	100 00
E. A. Richardson, Trustee.....	37	100	100 00
E. A. Richardson, Trustee.....	38	100	100 00
E. A. Richardson, Trustee.....	39	100	100 00
E. A. Richardson, Trustee.....	40	100	100 00
E. A. Richardson, Trustee.....	41	100	100 00
E. A. Richardson, Trustee.....	42	100	100 00
E. A. Richardson, Trustee.....	43	100	100 00
E. A. Richardson, Trustee.....	44	100	100 00
E. A. Richardson, Trustee.....	45	100	100 00
E. A. Richardson, Trustee.....	46	100	100 00
E. A. Richardson, Trustee.....	47	100	100 00
E. A. Richardson, Trustee.....	48	100	100 00
E. A. Richardson, Trustee.....	49	100	100 00
E. A. Richardson, Trustee.....	50	100	100 00
E. A. Richardson, Trustee.....	51	100	100 00
E. A. Richardson, Trustee.....	52	100	100 00
E. A. Richardson, Trustee.....	53	100	100 00
E. A. Richardson, Trustee.....	54	100	100 00
E. A. Richardson, Trustee.....	55	100	100 00
E. A. Richardson, Trustee.....	56	100	100 00
E. A. Richardson, Trustee.....	57	100	100 00
E. A. Richardson, Trustee.....	58	100	100 00
E. A. Richardson, Trustee.....	59	100	100 00
E. A. Richardson, Trustee.....	60	100	100 00
E. A. Richardson, Trustee.....	61	100	100 00
E. A. Richardson, Trustee.....	62	100	100 00
E. A. Richardson, Trustee.....	63	100	100 00
E. A. Richardson, Trustee.....	64	100	100 00
E. A. Richardson, Trustee.....	65	100	100 00
E. A. Richardson, Trustee.....	66	100	100 00
E. A. Richardson, Trustee.....	67	100	100 00
E. A. Richardson, Trustee.....	68	100	100 00
E. A. Richardson, Trustee.....	69	100	100 00
E. A. Richardson, Trustee.....	70	100	100 00
E. A. Richardson, Trustee.....	71	100	100 00
E. A. Richardson, Trustee.....	72	100	100 00
E. A. Richardson, Trustee.....	73	100	100 00
E. A. Richardson, Trustee.....	74	100	100 00
E. A. Richardson, Trustee.....	75	100	100 00
E. A. Richardson, Trustee.....	76	100	100 00
E. A. Richardson, Trustee.....	77	100	100 00
E. A. Richardson, Trustee.....	78	100	100 00
E. A. Richardson, Trustee.....	79	100	100 00
E. A. Richardson, Trustee.....	80	100	100 00
E. A. Richardson, Trustee.....	81	100	100 00
E. A. Richardson, Trustee.....	82	100	100 00
E. A. Richardson, Trustee.....	83	100	100 00
E. A. Richardson, Trustee.....	84	100	100 00
E. A. Richardson, Trustee.....	85	100	100 00
E. A. Richardson, Trustee.....	86	100	100 00
E. A. Richardson, Trustee.....	87	100	100 00
E. A. Richardson, Trustee.....	88	100	100 00
E. A. Richardson, Trustee.....	89	100	100 00
E. A. Richardson, Trustee.....	90	100	100 00
E. A. Richardson, Trustee.....	91	100	100 00
E. A. Richardson, Trustee.....	92	100	100 00
E. A. Richardson, Trustee.....	93	100	100 00
E. A. Richardson, Trustee.....	94	100	100 00
E. A. Richardson, Trustee.....	95	100	100 00
E. A. Richardson, Trustee.....	96	100	100 00
E. A. Richardson, Trustee.....	97	100	100 00
E. A. Richardson, Trustee.....	98	100	100 00
E. A. Richardson, Trustee.....	99	100	100 00
E. A. Richardson, Trustee.....	100	100	100 00

And in accordance with law, and an order of the Board of Trustees, made on the 15th day of December, 1872, so many shares of each parcel of said stock as may be necessary, will be sold at public auction, at the office of the Company, Room 21, Hayward's Building, No. 419 California street, San Francisco, California.

A. C. KIBBE, Secretary.

Office, Room 21, Hayward's Building, 419 California street, San Francisco, California. ja18

Meadow Valley East Extension M. Co.—
Location of works, Elko District, Nevada.

Notice is hereby given that at a meeting of the Board of Trustees of said Company, held on the 15th day of January, 1873, an assessment of ten cents per share was levied upon the capital stock of said Company, payable immediately in United States gold and silver coin, to the Secretary, at the office of the Company, Room 3, No. 419 California street, San Francisco, Cal. Any stock upon which said assessment shall remain unpaid on the 25th day of February, 1873, shall be deemed delinquent, and will be duly advertised for sale at public auction, and unless payment shall be made before, will be sold at public auction, on the 17th day of February, 1873, to pay the delinquent assessment, together with costs of advertising and expenses of sale. By order of the Board of Trustees.

T. W. COLBURN, Secretary.

Office, Room 3, 419 California street, San Francisco, California. ja18

Mohave Consolidated Gold and Silver Mining Co.
Location of works, Wallapai Mining District, Mohave County, Territory of Arizona.

Notice is hereby given that at a meeting of the Board of Trustees of said Company, held on the 15th day of January, 1873, an assessment of ten cents per share was levied upon the capital stock of said Company, payable immediately in United States gold and silver coin, to the Secretary, at the office of the Company, Room 3, No. 419 California street, San Francisco, Cal. Any stock upon which said assessment shall remain unpaid on the 25th day of February, 1873, shall be deemed delinquent, and will be duly advertised for sale at public auction, and unless payment shall be made before, will be sold at public auction, on the 17th day of February, 1873, to pay the delinquent assessment, together with costs of advertising and expenses of sale. By order of the Board of Trustees.

T. R. JEWELL, Secretary.

Office, Room 3, 419 California street, San Francisco, California. ja18

The Metropolitan Gas Company—Location
of works, San Francisco, in the County of San Francisco, State of California.

Notice is hereby given that at a meeting of the Trustees of said Company, held the 15th day of January, 1873, an assessment of Five (\$5) Dollars per share, gold coin, was levied upon the capital stock of said Company, payable immediately in United States gold and silver coin, to the Secretary, at the office of said Company, No. 304 Pine street, San Francisco, Cal. Any stock upon which said assessment shall remain unpaid on the 15th day of February, 1873, shall be deemed delinquent, and will be duly advertised for sale at public auction, and unless payment shall be made before, will be sold at public auction, on the 17th day of February, 1873, to pay the delinquent assessment, together with costs of advertising and expenses of sale.

A. D. BRILL, Secretary.

Office, No. 304 Pine street, San Francisco, Cal. ja24

Noonday Silver Mining Company—Location
of works, White Pine District, Nevada.

Notice is hereby given that at a meeting of the Board of Trustees of said Company, held on the 14th day of January, 1873, an assessment (No. 13) of Twenty cents per share was levied upon the capital stock of said Company, payable immediately in United States gold and silver coin, to the Secretary, at the office of the Company, No. 26 Hayward's Building, California street, San Francisco, California. Any stock upon which said assessment shall remain unpaid on Saturday, the 15th day of February, 1873, shall be deemed delinquent, and will be duly advertised for sale at public auction, and unless payment shall be made before, will be sold at public auction, on the 17th day of February, 1873, to pay the delinquent assessment, together with costs of advertising and expenses of sale. By order of the Board of Trustees.

JOSEPH MAGUIRE, Secretary.

Office, Room No. 26, Hayward's Building, 419 California street, San Francisco, California. ja25

Ophir Copper, Silver and Gold Mining Company of Placer County, California.
Location of works: Ophir, Placer County, California.

Notice is hereby given that at a meeting of the Board of Trustees of said Company, held on the 19th day of December, 1872, an assessment of ten cents per share was levied upon the capital stock of said Company, payable immediately in United States gold and silver coin, to the Secretary, at the office of the Company, Room 2, Express Building, at Montgomery street, San Francisco, Cal. Any stock upon which said assessment shall remain unpaid on the 25th day of January, 1873, shall be deemed delinquent, and will be duly advertised for sale at public auction, and unless payment shall be made before, will be sold at public auction, on the 17th day of February, 1873, to pay the delinquent assessment, together with costs of advertising and expenses of sale. By order of the Board of Trustees.

O. H. BOGART, Secretary.

Office—No. 402 Montgomery street, San Francisco, Cal. de28

Mount Jefferson Milling and Mining Company.
Location of works: First Garote, Tuolumne County, California.

Notice is hereby given that at a meeting of the Board of Trustees of said Company, held on the 18th day of December, 1872, an assessment of fifteen cents per share was levied upon the capital stock of said Company, payable immediately in United States gold coin, to the Secretary of said Company, at the company's office, 418 California street, San Francisco, Cal. Any stock upon which said assessment shall remain unpaid on Monday, the 27th day of January, a. n. 1873, shall be deemed delinquent, and will be duly advertised for sale at public auction, and unless payment shall be made before, will be sold at public auction, on the 17th day of February, 1873, at the hour of 2 o'clock p. m., to pay the delinquent assessment, together with costs of advertising and expenses of sale. By order of the Board of Trustees.

J. W. CLARK, Secretary.

de23-4w

Quail Hill Mining and Water Company—
Location of works, Calaveras County, State of California.

Notice.—There are delinquent upon the following described stock, on account of assessment levied on the 4th day of December, 1872, the several amounts set opposite the names of the respective shareholders, as follows:

Names.	No. Certificate.	No. Shares.	Amount.
W. H. Sharp.....	43	1	\$10 00
E. F. Dennison.....	42	1	10 00
E. A. Richardson, Trustee.....	45	60	600 00
F. S. Spring, Trustee.....	46	90	900 00
F. S. Spring, Trustee.....	47	30	300 00
J. C. Nicholls.....	48	100	1000 00
P. N. Lillenthal, Trustee.....	49	127	1270 00

And in accordance with law, and an order of the Board of Trustees, made on the 4th day of December, 1872, so many shares of each parcel of said stock as may be necessary, will be sold at public auction, at the office of the Company, No. 438 California street, San Francisco, California, on the 4th day of February, 1873, at the hour of 2 o'clock p. m. of said day, to pay said delinquent assessment thereon, together with costs of advertising and expenses of sale.

T. F. CRONISE, Secretary.

Office, 438 California street, San Francisco, Cal. ja18-4t

Sanderson Gold Mining Company—Location
of works, Railroad Flat, Calaveras County, California.

Notice is hereby given that at a meeting of the Board of Trustees of said Company, held on the 15th day of January, 1873, an assessment of ten cents per share, was levied upon the capital stock of said Company, payable immediately in United States gold coin, to the Secretary of said Company, at the office of the Company, Room 2, Express Building, at Montgomery street, San Francisco, Cal. Any stock upon which said assessment shall remain unpaid on the 25th day of February, 1873, shall be deemed delinquent, and will be duly advertised for sale at public auction, and unless payment shall be made before, will be sold at public auction, on the 17th day of February, 1873, to pay the delinquent assessment, together with costs of advertising and expenses of sale. By order of the Board of Trustees.

WILLIAM STUART, Secretary.

Office, 418 California street, San Francisco, Cal. ja11

Spring Mountain Tunnel Company—Location
of works, Lincoln County, Nevada.

Notice is hereby given that at a meeting of the Board of Trustees of said Company, held on the 15th day of December, 1872, an assessment of twenty cents per share was levied upon the capital stock of said Company, payable immediately in United States gold and silver coin, to the Secretary, at the office of the Company, Room 3, No. 419 California street, San Francisco, Cal. Any stock upon which said assessment shall remain unpaid on the 25th day of January, 1873, shall be deemed delinquent, and will be duly advertised for sale at public auction, and unless payment shall be made before, will be sold at public auction, on the 17th day of February, 1873, to pay the delinquent assessment, together with costs of advertising and expenses of sale. By order of the Board of Trustees.

J. M. BUFFINGTON, Secretary.

Office, 37 New Market's Exchange, California street, San Francisco, Cal. de21

Spring Mount Mining Company—Location
of works, Elko District, Nevada.

Notice is hereby given that at a meeting of the Board of Trustees of said Company, held on the 15th day of January, 1873, an assessment of twenty-five cents (25 cents) per share was levied upon the capital stock of said Company, payable immediately in United States gold and silver coin, to the Secretary, at the office of the Company, Room 3, No. 419 California street, San Francisco, California. Any stock upon which said assessment shall remain unpaid on the 25th day of February, 1873, shall be deemed delinquent, and will be duly advertised for sale at public auction, and unless payment shall be made before, will be sold at public auction, on the 17th day of February, 1873, to pay the delinquent assessment, together with costs of advertising and expenses of sale. By order of the Board of Trustees.

T. W. COLBURN, Secretary.

Office, Room 3, No. 419 California street, San Francisco, California. ja18

Stanford Silver Mining Company—Location
of works, Sierra District, Humboldt County, State of Nevada.

Notice is hereby given that at a meeting of the Board of Trustees of said Company, held on the 31st day of January, A. D. 1873, an assessment of ten cents per share was levied upon the capital stock of said Company, payable immediately in United States gold and silver coin, to the Secretary, at the office of the Company, Room 26, Hayward's Building, California street, San Francisco, Cal. Any stock upon which said assessment shall remain unpaid on the 25th day of February, 1873, shall be deemed delinquent, and will be duly advertised for sale at public auction, and unless payment shall be made before, will be sold at public auction, on the 17th day of February, 1873, to pay the delinquent assessment, together with costs of advertising and expenses of sale.

CHAS. H. FISH, Secretary.

Office, Room 26, Hayward's Building, 419 California street, San Francisco, California. ja11

The Piedmont Land Company—Location
of property, Alameda County, State of California.

Notice is hereby given that at a meeting of the Directors of said Company, held on the 27th day of December, 1872, an assessment of seven dollars, gold coin, per share was levied upon the capital stock of said Company, payable immediately to the Secretary of said Company, at his office, No. 522 California street, San Francisco, Cal. Any stock upon which said assessment shall remain unpaid on the 15th day of January, 1873, shall be deemed delinquent, and will be duly advertised for sale at public auction, and unless payment shall be made before, will be sold at public auction, on the 17th day of February, 1873, to pay the delinquent assessment, together with costs of advertising and expenses of sale.

FRANK JAYNES, Secretary.

San Francisco, Cal., Dec. 29, 1872. ja2-3t

Virginia Consolidated Mining Company—
Location of mines, Bearsgate Mining District, Inyo County, State of California.

Notice.—There are delinquent upon the following described stock, on account of assessment levied on the 14th day of December, 1872, the several amounts set opposite the names of the respective shareholders, as follows:

Names.	No. Certificate.	No. Shares.	Amount.
Tyler Curtis (balance).....	9	2728	\$29 56
Tyler Curtis.....	10	910	18 20
George Hearst.....	11	4090	81 80
George Hearst.....	12	1365	27 30

And in accordance with law, and an order of the Board of Trustees, made on the 11th day of December, 1872, so many shares of each parcel of said stock as may be necessary will be sold at public auction, at the residence of Maurice Pore & Co., No. 327 Montgomery street, San Francisco, California, on the 10th day of February, 1873, at the hour of 12 o'clock m. of said day, to pay said delinquent assessment thereon, together with costs of advertising and expenses of sale.

T. B. WINGARD, Secretary.

Office, No. 318 California street, San Francisco, California. Room No. 13, third floor. ja25

Yuie Gravel Mining Company—Location
of works: Viola Claims, Township No. 8, Placer County, California.

Notice.—There are delinquent upon the following described stock, on account of assessment (No. 2) levied on the 15th day of December, 1872, the several amounts set opposite the names of the respective shareholders, as follows:

Names.	No. Certificate.	No. Shares.	Amount.
Bixby, H. G.....	407	5	\$ 20
Belding, Owen.....	343	70	14 00
Belding, Owen.....	347	35	7 00
Bryant, John.....	418	20	4 00
Canlier & Everett, Trustee.....	422	10	2 00
Cope, J. V.....	422	50	10 00
Dore, Benj, Trustee.....	91	50	10 00
Dore, Benj, Trustee.....	92	50	10 00
Dore, Benj, Trustee.....	125	10	2 00
Dore, Benj, Trustee.....	130	20	4 00
Dore, Benj, Trustee.....	409	16	3 20

Names.	No. Certificate.	No. Shares.	Amount.
Folson, Geo T.....	339	10	2 00
Gummer, W. P.....	304	10	2 00
Goodyear & Blake.....	316	5	1 00
Goodyear & Blake.....	350	50	10 00
Goodyear & Blake.....	349	45	9 00
Holmes & Co., A. Trustee.....	309	30	6 00
Holmes & Co., A. Trustee.....	344	30	6 00
Holmes & Co., A. Trustee.....	348	15	3 00
Hynesmann, S. Trustee.....	372	20	4 00
Hussey, J. L. Trustee.....	371	10	2 00
King, J. L.....	276	60	12 00
Lounberg, S. Trustee.....	105	20	4 00
Lounberg, S. Trustee.....	285	10	2 00
Lounberg, S. Trustee.....	415	50	10 00
Lounberg, S. Trustee.....	317	10	2 00
Logan & Eden, Trustees.....	339	20	4 00
Martha & Laue, Trustees.....	282	5	1 00
Richardson, E. A. Trustee.....	142	30	6 00
Richardson, E. A. Trustee.....	148	15	3 00
Richardson, E. A. Trustee.....	307	50	10 00
Richardson, E. A. Trustee.....	305	25	5 00
Richardson, E. A. Trustee.....	327	20	4 00
Richardson, E. A. Trustee.....	338	30	6 00
Richardson, E. A. Trustee.....	341	60	12 00
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Richardson, E. A. Trustee.....	356	40	8 00
Richardson, E. A. Trustee.....	355	30	6 00
Richardson, E. A. Trustee.....	394	25	5 00
Richardson, E. A. Trustee.....	396	10	2 00

Copper Mining in Australia.

Mr. Anthony Trollope, writing from Adelaide to the *Daily Telegraph*, has referred to the Wallaroo mines, and as a paper has recently been received in this country from the superintendent of these mines giving further particulars, it will not be uninteresting to refer to them at greater length. The paper which we speak of was sent to the secretary of the Geological Society in Cornwall, and the museum of that society has been greatly enriched by a present of copper ores from this district, from Mr. Higgs, Jr., the superintendent; the specimens being described by Mr. Warrington Smyth, as something perfectly new in mineralogical cabinets. We shall first hear what Mr. Anthony Trollope has to say upon the subject. He says: "The South Australian copper of the present day—that by which one hears of this man making his 40,000 a year, and that other man winning his 50,000—is the copper which comes from the Yorke peninsula, a jutting territory somewhat in the shape of Italy, which lies between Spencer's Gulf and Gulf St. Vincent. Here are the Wallaroo mines and the Moonta mines; here also are the Wallaroo smelting works; and here is the mining pride of South Australia. These "diggings" were in the first instance discovered by shepherds, who by chance found copper on the surface of the soil. This happened first at Wallaroo, in 1860, and then at Moonta, ten miles distant from Wallaroo, in the subsequent year. Since that time four towns have sprung up, called Kadina, Wallaroo Mines, Wallaroo Port, and Moonta Mines, which among them contain about 17,000 people. The average wages at the mines are from 35s. to 38s. a week. In the smelting works at Wallaroo Port the average wages are 42s. a week. The smelters have generally come from Wales, and the miners from Cornwall. No laborer unused to mines would find employment below ground, so great and sufficient has been the influx of miners. I saw aborigines working here on surface work, and receiving 4s. 3d. a day wages. I was assured that they came regularly to their tasks. I call attention to this because it was the only instance I had found in Australia in which the native blacks were reported to have worked regularly. Copper has been found widely scattered through the colony. I find a list of seventy "reputed" mines to the end of 1870, of which all except six, were supposed to produce, or at least to contain, copper. These "reputed" mines are claims as to which applications made to the Government have been entertained, and for which the Government is entitled to charge a rent. No doubt many of them are not worked. In regard to some of them it must be said that the distance from the seaport is so great that they cannot be worked profitably till railway accommodation shall have been extended. The great wealth of the Wallaroo and Moonta mines arises from their proximity to the sea."

Mr. Higgs, the superintendent of the Wallaroo and Moonta Mines, tells us that Yorke's Peninsula is about 15 miles long, and varies in width from 25 to 50 miles; that it is entirely destitute of fresh water except in three or four places on the sea-shore, where wells have been sunk, and a brackish water found, which, for want of better, the cattle drink. The country from the Hummock's range of hills, situated at the head of the peninsula to the extreme south point, is nearly a dead level, undulating slightly in one or two places. The only natural vegetation is a stunted mallee tree scrub, and a coarse grass which grows rapidly, but when a South Australian sirocco comes, it is quickly burnt off, making the country a wilderness. The native population, he says, is small, and never exceeds 350. He accounts for the smallness of the tribe by the scarcity of water, and the same reason may also account for the smallness of the native population in so many parts of Australia. The climate is a most trying one, and in no part of the world are the ranges of temperature so great. Often in the daytime a difference of 40 degrees may be noted. The hot winds and dust storms hurled along from the dry parched plains of the north, are at times almost unbearable, and to work during their continuance is out of the question. All nature seems gasping, and the birds soon succumb to their baneful influence. The rainy months are June, July and August. The surface-rock, or crust of the country, and some of the overlying rocks, are of very recent formation. As a rule, the rock of the district is a clay-slate, overlaid by a bed of unconformable limestone. In one or two places there is an overlying rock on the clay-slate of very recent tertiary formation, intensely hard, and which makes very excellent building stone. But even this recent formation has the same overlying bed of limestone. On the sea-shore of the east coast of Spencer's Gulf from Parara to Black Point, one might almost say that a bed of this tertiary rock is to be seen gradually forming, for the fossils in the rock itself are identical with the shells and crustacea, and other living organizations to be seen and found on the sea-shore. Midway between these two points in the sandstone formation is a large deposit of phosphate of iron. At Black Point the clay-slate protrudes, and here are to be seen several promising copper lodes which, when the metal commands a high price, will no doubt be profitably worked. The same recent formations of rock are to be found all the way down the coast, the clay-slate being occasionally exposed,

Crossing the peninsula about midway between the two gulfs at Boor's Plains, is the lot of hard tertiary rock previously mentioned. It appears to be of older formation than that just described. It is quarried for building purposes, but not to such an extent as to enable one to decide how it lies in connection with the clay-slate. The bed of unconformable limestone that is overlying the whole of the land of the peninsula varies in thickness from a mere crust to 3½ feet. In places it is intensely hard to break through, but in others it is very friable. As a rule, immediately under it is a bed of clay from 3 to 12 feet in thickness, and occasionally the rock is struck immediately under the limestone. With regard to the mineral deposit, indications of copper in the peninsula were observed in 1859 by a gentleman who then held the district as one of his outlying sheep runs. He picked up on the beach, near the site of the present smelting works, some green ore (malachite of copper) and he was convinced that deposits of this mineral existed inland. It was not, however, till after much labor that he succeeded in the following year in discerning it. One day, when exploring one of the dense mallee tree scrubs, he came across the workings of a wombat, and turning over the debris of the hard limestone which had been so patiently dug through by this extraordinary animal, quite a burrow of green ore was found. Pits were quickly laid down, and very soon the back of the great Wallaroo lode was laid open and its course traced up. This discovery was quickly followed by others of equal importance. Such, then, is the true origin of the discovery of copper in this district, which so soon had to play so important a part in the world's market for this particular metal. The main bearing of all the productive lodes in Wallaroo is from 20 to 24 degrees south of east and north of west, and up to this time no copper in quantity has been found in any lode much out of this bearing. The lodes warp up in places considerably, and just at the angle of their so doing they are most productive. If they continue in a straight line, with smooth walls, they soon become poor. The great Wallaroo lode for the greater part dips south at an angle of 15 degrees, but in one place where it has been very productive it is almost vertical. The underlay here, if any, is slightly to the north. It is worthy of note that where the lode is vertical the quality of ore is much richer (2½ per cent. produce at least), than where it takes an underlie. Mines lode dips north at an angle of about 12 degrees. The same remark as to the increased richness of the ore when the lode takes a downward course applies also to these veins. The Wallaroo main lode has been worked on for rather more than 2½ miles in length of ground in all cases productive. It has been laid down as an established fact, that unless the clay-slate carries with it a considerable quantity of mica, or, indeed, unless it assumes almost the character of micaceous, the lodes will not carry copper in payable quantities. Hence one of the reasons of the occasional non-productiveness of the Wallaroo lodes, and the cause of many disappointments; and the cause of disturbances in the lodes are the numerous slides and faults. The slides are most irregular, and the principal ones have a tendency to throw the mineral deposits westwards. This is now plainly shown in the deepest workings at 120 fathoms, where the main shute of ore is carried away bodily by a slide. At the point where the lodes are cut off by the slides they are most productive, and the same thing is observable when they are picked up again on the other side of the slides. The lodes are not rich in either earthy or metallic minerals, save copper. All the lodes in this district have been found by surface indications, either from green ore being thrown out by the wombats, or forked up by some of the burrowing insects. This green ore is almost invariably a malachite, sometimes the copper is found in the form of grey sulphide adhering to the limestone crust, oftentimes coated over with a layer of lime. In the former case the lode can easily be traced up, and the ore easily taken away, for the ground is generally very soft. The green ore goes down, as a rule, about 13 fathoms, when it changes to black oxide, and very soon after, say 5 fathoms, to the usual sulphide of copper, more or less mixed up with iron pyrites. If the lode is very productive, the iron pyrites give way entirely to the more valuable associate. One thing to be noted respecting these iron pyrites is, that they are generally on the productive lodes and found on the hanging wall, so that when dressing ore they are easily picked out; when the surface ore takes the form of grey sulphide it soon changes to a red oxide, not unfrequently mixed with malleable copper, and that soon changes to the sulphide of copper, perhaps at an average depth of 12 fathoms. The surface deposit from a lode of this sort is much richer than where the back forms a malachite, the percentage in one case averaging 20 per cent., while in the other 10 per cent. would be considered good; but this difference of quality as regards surface ore does not hold good with the sulphide under. The quality under both would be about the same. The size of the lodes vary from 20 feet to 1 foot wide. The great shute of ore in the Wallaroo mines at the 40 fathom level was 16 feet wide, of solid ore of 12 per cent. produce. The water in the mine is very salt. Fortunately for pit work there was no free acid in it, and hence little inconvenience was felt. This water, however, corrodes the boilers very quickly, and they have to be cleaned every six or eight weeks. It is estimated that over 250,000 tons of 12 per cent. ore has been returned from this district since the first sales in 1861 up to the present time.—*The Mining World*.

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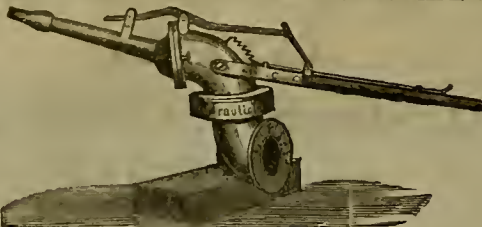
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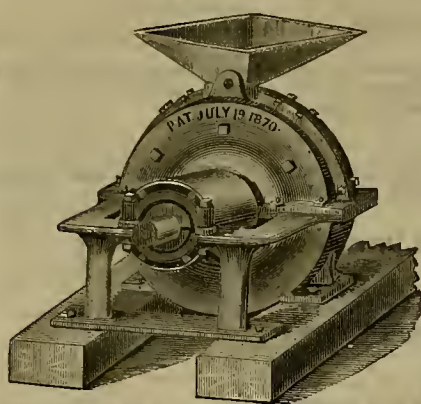
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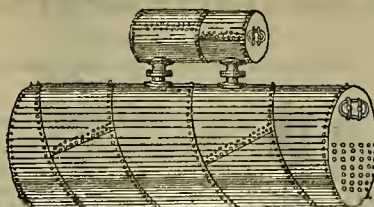
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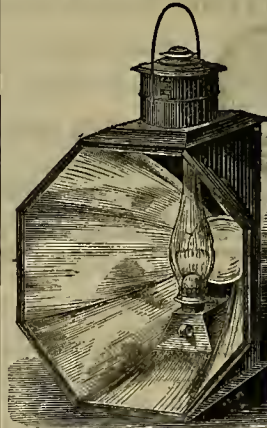
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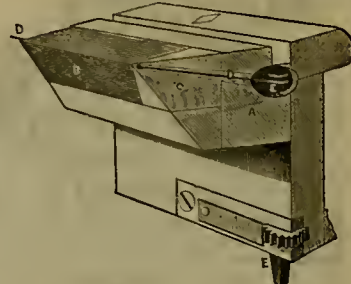
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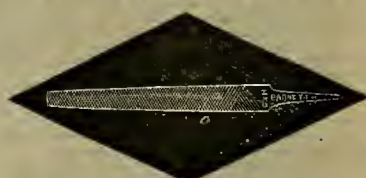
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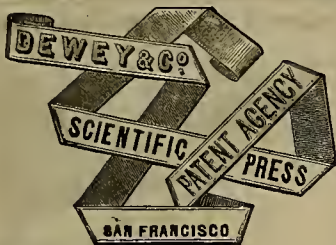
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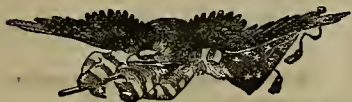
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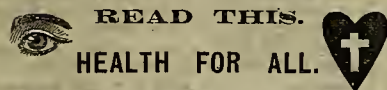
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PROPOSALS FOR

Material and Work

FOR A PORTION OF

THE NEW CITY HALL BUILDING.

OFFICE BOARD CITY HALL COMMISSIONERS,
 San Francisco, Nov. 25, 1872.

Sealed proposals for furnishing certain material for a portion of the New City Hall Building and Hall of Records, and for the construction thereof, will be received at the office of the Board of City Hall Commissioners, corner of McAllister and Leavenworth streets, until 12 o'clock M. of FRIDAY, the 24th day of January, A. D. 1873, viz:

5,000 Barrels Cement;

Rolled Iron Joists;

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All according to the Printed Specifications, Schedule, etc., and Plans and Drawings.

The Printed Specifications and Printed Forms of Proposals can be had on application to the Secretary, and the Plans and Drawings can be seen, and all further information—as to details of the work, etc.—can be obtained from the Architect, at the office of the Board of the Bids must be indorsed for the Material proposed to be furnished or Work done, and addressed to the Secretary of the Board.

No Bid will be entertained unless made on the specified "Printed Forms of Proposals," and accompanied by a certified check or bond, with two good and sufficient sureties, in a sum equal to 10 per cent. of the total sum of the tender, to be returned on the due entering into the contract of the party to whom it may be awarded, or to be forfeited if the party fail to enter into the said contract.

The Board reserve the right to reject any and all bids. Payments will be made monthly, in "City Hall Warrants," of 75 per cent. of the estimated amounts due, and the remaining 25 per cent. when the contract is completed.

P. H. CANAVAN,

JOS. G. EASTLAND,

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Board of City Hall Commissioners.

Notice of Postponement.

The time for receiving Proposals, as above, is hereby extended to 12 o'clock M. of SATURDAY, the 15th day of February, 1873.

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MINING AND SCIENTIFIC PRESS.

An Illustrated Journal of Mining, Popular Science and Progressive Industry.

BY DEWEY & CO.,
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SAN FRANCISCO, SATURDAY, FEBRUARY 1, 1873.

VOLUME XXVI.
Number 5.

The Movements of the Stars.

The second lecture upon this interesting subject was delivered by Prof. J. Le Conte, on Jan. 25th.

The ancients supposed the stars to be incorruptible, eternal, and fixed in their conditions. Modern astronomers have shown that change, which is so indelibly stamped on all things earthly, is also the great law of the universe. The appearance of new stars, the disappearance of old, and important physical changes in old and well known celestial orbs is now well established.

Not only have physical changes been demonstrated, but, it has been proven that

The Great Law of Gravitation

Also extends throughout every part of the universe. Modern instruments have shown that there are in reality no "fixed" stars—their apparent fixedness results only from the fact that their immense distance renders their motion imperceptible except to the most perfectly constructed instruments.

Colors of the Stars.

Even to the naked eye, a marked difference is apparent in the colors of different stars. The different shades of color are much more apparent when viewed by the aid of proper instruments. Some very remarkable and very suggestive facts are also connected with variations in the color of stars. It is found that white, red and yellow are the colors generally found among single stars, blue and green are restricted to multiple stars. This variety of light in binary stars or suns must be productive of most remarkable phenomena on the surface of any planets which may be circling around them. Days of alternate color must come and go. When a green sun rises, the light will be green until by the subsequent rising of its red companion the two lights will be blended, until the setting of the former, when a red day will set in. At those seasons when the suns are on opposite sides of a planet, red and green days will alternate, without any intervening night; and at the intermediate epochs, all the various durations of ruby, emerald and white periods will diversify the days. The imagination will find here a domain into which graceful faucy may make excursion.

Proper Motion of the Stars.

Another very interesting subject of inquiry in the physical history of the stellar universe, is the proper motion of the stars. The difference of their proper motions will inevitably mingle the constellations in a few billions of ages. The magnificent Southern Cross will not always shine in the heavens exactly in its present form; for the four stars of which it consists, move with unequal velocity in different paths. By the procession of the Equinoxes, the Celestial Pole does not always occupy the same place in the starry sphere.

In about twelve thousand years the lesser Bear will rise in the northeast, culminate over the heads of our successors and set in the northwest, "while the Beautiful Harp will take its station in the northern watch-tower, furnishing a far more brilliant pole star than the one which we enjoy."

Motion of the Solar System in Space.

Careful observations have rendered it morally certain that our own sun with its system of planets and moons is moving through space with a velocity of nearly twenty times that of a cannon ball. But reasoning from analogy, we cannot suppose that this motion is in a direct line. The sun must follow the universal law of rectilinear motion. It must therefore be admitted that our solar system is moving around its central sun, and we naturally ask, What is the nature of its path? Is it a mighty curve? Shall we ever be able to trace out an arc of the solar orbit, and indicate the direction in which the preponderant gravitation of the sidereal firmament is urging our central

luminary? If so, what is its vast radius, where is its centre, and what the duration of the grand solar year?

The problem is unquestionably resolvable; Stellar astronomy is slowly and surely accumulating the materials for its solution. But a countless series of ages may, perhaps, elapse before the achievement of so magnificent a triumph of inductive science will be completely realized.

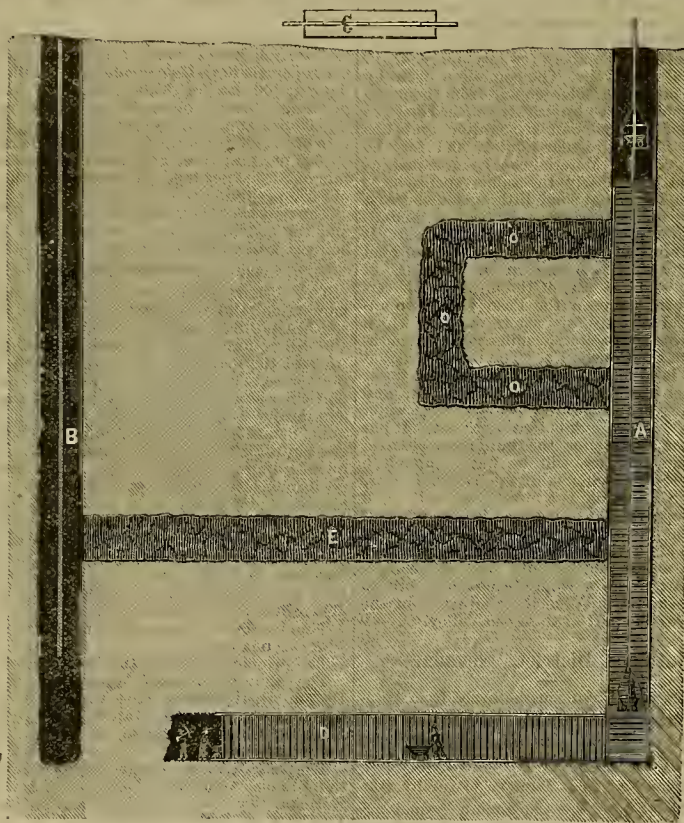
Improved Appliances for Ventilating Deep Mines.

[Written for the Press by DR. A. BLATCHLY.]

To insure the ventilation of shallow mines which are opened only a few hundred feet below the surface, no great amount of care or high degree of skill is required. The heat at

on the same level, but if one is considerably above the other the movement will be much more active. This system of ventilation will allow working to as great depths as any mines have been opened. Even where drifts and winzes are run as at *O, O, O*, and both drifts open into the same shaft a considerable current of air will be found, sufficient to work when the ground is not very hot.

But when it is required to run a drift as at *D*, from the bottom of the shaft through very hot ground the greatest difficulty is experienced. To cool a drift like *D* I should divide it by a partition through the centre, and connect each with one of the divisions in the shaft, and this would cause a current that would tend greatly to cool the drift; this division has long been practised in shafts, but it is equally efficient in a drift. By building the bottoms of the cages as open as possible and providing them with iron rods, feathered with light sheet-iron, as



METHOD OF VENTILATING MINES.

that depth is not much greater than at the surface and only fresh air for the miners is required. But when the depth is from one to two thousand feet, as in the deepest openings of the Comstock lode at Virginia, the whole earth is too hot to admit of working unless it is cooled from above.

Where the mine is fully opened with several shafts properly connected below, the natural movement of the air effects this cooling without any expenditure of power. But where from any cause this is not done, blowers and fans of various patterns are employed, which are run by steam engines. I propose to describe two methods of ventilation, the first of which, so far as I know, is novel; the other was invented by Ewbank over twenty years ago. Each is simple, utilizes waste power, and is self-acting.

Our engraving represents a section of a mine. *A* and *B* are shafts which extend vertically to the surface and where they are connected as by the drift *E*, there will be a constant current of air, even if the mouths of the shafts are both

shown at *G*, when the sheet-iron plates are vertical the air passes freely through the bottom of the cage, but when the plates are turned horizontally the bottom of the cage acts in the shaft like a piston in a cylinder, and in its descent forces a large body of cool air into the drift, and the cage in the other apartment of the shaft lifts out the hot air.

By an automatic arrangement (a ratchet and two pawls, one above and one below), when the movement of the cages is reversed, the plates are reversed and the air passes through the cages and is moved comparatively little. In this manner, when the cages are running in a shaft, ten or fifteen hundred feet deep, ten thousand cubic feet of air per minute can be forced into the drift. This would be probably sufficient to allow a drift to be worked three thousand feet below the surface, which is deeper than the great majority of mines will pay to work.

The cost of running a drift sufficiently large to be divided by a partition would not be greatly in excess of one of ordinary size, as is a well-known fact in mining that a large drift can be run relatively cheaper than a small one. In the next issue we shall give a drawing and descriptions of Ewbank's Ventilator; it is more complicated than this, but is a very efficient.

An Advancing Institution. Our Local Academy of Sciences.

We have in our midst a very deserving institution, the California Academy of Sciences, which is advancing rapidly, not only in the estimation of the public, but in material prosperity. For a number of years the members of the Academy have been striving against many disadvantages to place the association on a proper footing in the community. The great trouble has been want of finances, and in consequence there has been no means of fitting up the rooms neatly, enlarging the library or properly displaying the collections.

It is somewhat strange that among all the moneyed men in this city and State, none of them have ever made a donation of any size to this association. If they owned a building of their own where they could display the large and varied collection of curiosities which has been accumulated, it would really be a benefit to the community. The majority of these things are California and Pacific Coast productions, many of them rare, new or useful, and were they placed in a position where they could be examined by the public, much good would result from it. As it is now, they are all stowed away in boxes and barrels in a few very dusty rooms, and the members themselves are unable to see them. The location of the rooms of the Academy is an objectionable one and their appearance are not at all prepossessing. In fact, many of the members are averse to bringing a friend to the meetings because the rooms are in such a generally dilapidated state.

We are glad, however, to note, that since the visit of Professor Agassiz, the Academy has become imbued with new life; a large number of new members have been elected, many of them life members, and a goodly proportion of them well to do in the world. These new members bring others with them, and take great interest in the proceedings, as may be seen from the fact of the greatly increased attendance during the past six months. The President, Professor George Davidson, of the Coast Survey, is a "live" man and has done a great deal to create an interest in the proceedings and advance the interests of the institution. The proceedings of the association are to be found in all the learned institutions abroad, where they are highly appreciated. This Coast is as yet comparatively a fresh field for the naturalist, entomologist, geologist, conchologist, botanist, etc., and their researches here are of much interest, not only to scientific men but to the general public.

A few enthusiastic members have labored assiduously for a number of years in their different departments, and have in that time gathered extensive and varied collections of both old and new forms. These, as mentioned before, are packed away for want of room, and are therefore not available for inspection. These gentlemen, have, of course, received no remuneration for their services, which were rendered to the cause of science; and it seems but just for others who have the means, to show their appreciation of this labor by providing proper places for exhibition. The world is much indebted to science for its advancement, but people generally are too apt "to accept results, as a matter of course, without ever considering the source from whence they came. The members of this association have learned to labor and to wait, and have remained in a semi-quiet state for years hardly recognized by the community in which they reside, and they have received as rewards at home, more derision than praise.

California now, however, is like older countries, beginning to recognize the benefits of science, from which her mineral resources in particular, have received much benefit, and the time will be but short, if it has not already come, when our local Academy of Sciences will be recognized as one of the institutions of the city and State to be proud of. That this appreciation is felt outside of our borders is evident from the status which the proceedings have abroad.

CORRESPONDENCE.

Yuma County Mines, Arizona.

Our occasional correspondent, Dr. W. Bredemeyer, who has just returned from a professional visit to Arizona, gives us some extracts from his report on the Constantia Mine, near Ehrenburg, Roberts' Station, Yuma county, Arizona, and a few general notes of the country which will be interesting to our readers. The report on the Constantia Mine will give an idea of the character of the lodes in that section. Mr. Bredemeyer, says:

The town of Ehrenburg is situated on the Colorado river, about 100 miles above Fort Yuma and about 300 miles above the mouth of the river, in Arizona. La Paz, at present an uninhabited town, is situated about six miles above Ehrenburg, also on the Colorado river. From the neighborhood of La Paz, a solid range of primitive mountains runs from S. W. to N. N. E. almost parallel with the Colorado and to similar ranges east, separated by great plains from seven to fifteen miles wide. The first range ceases about eight miles north. In the middle of this range, east from La Paz, is a good and splendid pass leading to the great gold fields discovered in 1860, and ever since worked very successfully by dry washings, for the want of water. These placers begin about seven or nine miles from a town in Ferra's Gulch; from here they go easterly through various gulches to the pass. This gold is very fine in quality but coarse in appearance. I am told, that pieces from two and a half to three ounces were found here. This pass is small and narrow at first, but widens soon. The ranges north are principally granite and are the head auriferous range of this part. Those to the south are tapped by gneiss and primitive elates traversed by a great number of veins of argentiferous copper ores, consisting of sulphurets with a high percentage of silver and gold. The ground between the two ranges last spoken of, form a triangle of an area of ten miles of which the greater part is formed by low rolling hills of talcose and other elates, only broken at one point by quartz and porphyry, forming a peak. Around this peak appears large, solid quartz veins. All the rolling country is in fact full of large veins of auriferous quartz. At the foot of this mountain range, about twenty miles from Ehrenburg, are very large outcrops of very good gold-bearing quartz of great regularity, and deeply stained with oxide of iron.

The largest of these outcrops are the Constantia and Los Posos, from 8 to 24 feet in width and plainly visible for a distance of three miles; sometimes, after being plainly visible for 300 or 400 yards, disappearing for a short distance among the rolling hills, but always reappearing again. An immense quantity of quartz is in sight, showing gold everywhere. There is no place over the whole surrounding country, but that you can wash out gold.

The Constantia Lode

Has a very good appearance, and is in reality a valuable property. If situated in California it would advance to one of the first mines of the market. The Constantia is a regular solid, rich vein. The gold is distributed through the whole vein, from southeast to northwest, and so also through the whole of the present explored depth of 105 feet. To the northwest the vein appears the richest. There are places which assay over \$300 per ton, for a distance. The gold appears in two forms. In the terrigenous quartz it is very fine wherever the rock is broken. It appears coarse and solid, sometimes with pyrites of iron. A string of a reddish earthy mass contains very fine gold in great quantities. Through the whole vein, wherever this reddish, earthy mass (decomposed pyrites) appears, the percentage of gold is the highest. In this mass the assays are from \$90 to \$300 per ton. In general, all over the vein the assays will give at my lowest estimation from \$25 to \$30 per ton.

Description of the Constantia Mine.

Commencing southeast 650 feet from the northwest boundary of the Constantia, we have shaft No. 6 driven and sunk on the vein 100 feet deep. From this shaft a drift runs north eight feet; 130 feet more southeast is a small shaft 22 feet deep, from which runs a drift southeast 25 feet long, which shows the vein in splendid condition, eight feet wide and containing a high percentage in gold. From this little shaft still further southeast, 65 feet, is a shaft 90 feet deep. From this shaft at a depth of 35 feet a drift runs northwest seven feet and 50 feet southeast to another shaft, 97 feet deep, and from this shaft still 75 feet further southeast. In this shaft the hanging and footwalls are both very regular. The vein in this shaft is five feet wide. At the northwest end of the drift the vein is also five feet wide; crossing the 90 foot shaft to the southeast the vein widens to 11 feet; towards the 97 foot shaft the vein turns narrower and is at the southeast end of the drift only two feet wide. Through the whole drift its appearance is very good and shows free gold everywhere. Through the 90 foot shaft the vein widens from 3½ to 11 feet.

Seventeen feet north northwest of the 97 foot shaft is a little shaft sunk, only three feet in diameter, for the purpose of hoisting ore from

a surface drift, running 40 feet northwest, which is about 18 feet deep. Here, at the cross-point of this little shaft with the surface drift, the vein disappears, but is found again 15 feet deeper from the drift and also 15 feet further southeast; commencing on the footwall 100 feet southeast from the 97 foot shaft is another shaft 80 feet deep. Upon a depth of 50 feet in this shaft runs a drift 32 feet southwest through the footwall and another drift 12 feet northwest, which strikes the vein one foot wide. The southwest drift stays in the slate six feet deeper from the drift. The vein appears in the shaft two feet wide and reaches at the bottom of the shaft a width of six feet. This shaft is commenced in the headwall of the vein.

Nearly 600 feet further southeast from the 80 foot shaft is sunk a vertical shaft, belonging to the Los Posos mine, which strikes the vein 1½ to 2 feet wide at a depth of about 40 feet. This shaft is 100 feet deep. The vein has a fall from 45° to 50°, but dips at a depth of about 60 ft. in the 90 ft. shaft suddenly, with a fall of about 75°. In my opinion, the disappearance of the vein in the little shaft is only a springing of the vein, as the vein appears again only 12 feet south of the drift as a large *halvorkel* pointing out at its ends, and in the surface drift about 26 feet northwest of the little hoisting shaft, has a width of 24 feet of very rich gold-bearing quartz; not the whole 24 feet is quartz, but from the footwall eight feet of rich quartz, then four feet talcose slate and then again 12 feet quartz. Here the vein shows this string of a reddish, earthy mass of high percentage in gold, larger and richer than anywhere, and this is the same string that assays in the 90 foot shaft 10 or 15 feet below the surface, over \$300 in gold per ton.

The Country and Roads.

The whole area around the Constantia shows plainly a net of rich veins, parallel and crossing each other, giving a picture of a large tree laying down with a great number of branches. The whole valley is traversed by numerous little gulches, which are in many places fringed with a heavy growth of galleta and other grasses. The valley has also an abundance of ironwood, mesquit and pale-verde which, with the exception of the last, is excellent fuel for smelting or all metallurgical purposes. The roads from the mine to the mill (four miles) and thence to Ehrenburg (twenty miles) are in very good condition. The communication by steamer down the Colorado and from thence to San Francisco, also by stage from Ehrenburg to San Francisco via San Bernardino and Los Angeles is safe, regular, quick, and for the country, cheap. Material can be got just as easy and with nearly the same expense as at places in Nevada at some little distance from the railroad. The climate is healthy, and although it is pretty hot in the summer (140°) it has no influence on the work. The main road of the Poso Valley passes within four miles of the mine and one mile of the mill. I am certain that there are in the Poso Valley two underground streams of water, one of which comes from New-water, 30 miles south of southeast from the Constantia. The present well at the mill is 45 feet deep and has sufficient water to run ten stamps, two pans and settler, and for the use of the working people. The water is clean, healthy, and is free from salt. It has a nice temperature for the milling process. I am certain that there will be water enough to run a mill of 50 stamps through the whole year, and the Constantia is a mine that could and would supply a 100-stamp mill with sufficient ore at the rate of \$25 per ton.

There are here a number of miners who own valuable mines, and are only waiting for capital to start, and who would bring their ore to the Constantia mill, as it is situated in the most favorable part of the Poso Valley.

Antelope District, Nevada.

EDS. PRESS:—Having just returned from Antelope District, Lander county, in this State, and having seen some very valuable quartz mines, superintended by one of our well known pioneer prospectors, Mr. Daniel McMurchy, the original locator of the Caledonian Tunnel and Mining Co., Storey county, and being a reader of your valuable journal I think, perhaps, the annexed might be fit for publication in your paper.

The Evening Star, Highland Chief, Indian Queen, Alabama, Merrimack Monitor and Kearsarge mines, located in Antelope mining district have, since March, 1872, been discovered by the old prospector, Mr. Daniel McMurchy; they promise to be true fissure veins, well defined with good walls. The ledges run north and south and parallel with each other, the core being six to eight feet from wall to wall, while the facilities for wood and water surpass anything in the State of Nevada. The mines are located forty miles north of Eureka, or forty-five miles south of Palisade on the C. P. R. R., where a very superior road on which machinery of every kind can be delivered at the mines with cheapness and dispatch. The mines have been examined by General Cadwalader of this State, (a miner of acknowledged reputation) who reports there is more good ore in sight than in any mine he had seen in any part of this State, having every facility wherewith to make them permanent mines, and in the hands of a Superintendent such as Mr. McMurchy, who is bound to develop them to

their utmost extent, they are bound to become permanent mines. Mr. McMurchy is working with a full force of men in order to develop the mines thoroughly and secure a United States Patent. He intends to incorporate the mines in San Francisco about the 1st of April, so soon as a full development is made. Any company who are in search of "O K" mines would do well to visit Antelope district and see Mr. McMurchy, who can show them mines that are unsurpassed in this State. J. M. E.

Resources of Utah.

We continue the articles under this head from the Salt Lake Tribune:

The Mining Interests.

Utah is traversed from northeast to southwest by a great mineral belt, about seventy miles in width and several hundred miles in length, the result, doubtless, of several distinct upheavals, peculiarly well defined, and in variety of production covering a wide range of metalliferous deposits.

The development of this discovery, during the past two years is probably without a parallel in history, and the mines of Utah have taken their place in the public mind as one of the permanent industries of the country.

The minerals consist mostly of the base metals, of which lead is the chief, carrying silver, and in some cases gold, in quantity varying from a few ounces to one hundred and fifty ounces of the former metal to the ton.

Copper also occurs in various forms, and in many instances large quantities. Valuable discoveries have been made in chlorides and "horn silver," of surpassing richness, varying in actual assay value from \$500 to \$27,000 per ton. Assays have been made from ore taken from the Silveropolis mine, in East Cañon, of \$20,000 per ton, and shipments of a number of car loads of ore have yielded an average of \$666 per ton.

Ore from the Shamrock mine, in East Cañon, has assayed as high as \$27,000 per ton. Shipments have been made from this mine which have given returns of from \$1,800 to \$5,600 per ton.

The Mono mine in Dry Cañon, is also noted for the richness of some of its ores. Sales of small parcels have been made at the following figures: 400 lbs. for \$5,000, equal to \$20,000 per ton. One and one-half tons at the rate of \$2,500 per ton, and the same quantity at the rate of \$2,400 per ton; two tons at the rate of \$1,600 per ton; three and one-half tons at the rate of \$1,000 per ton, and two tons at the rate of \$650 per ton.

The names of the principal mining districts and the leading mines developed and being actively worked are as follows:

Little Cottonwood District.

This district is in the Wahsatch range of mountains and is distant twenty-five miles southeast of Salt Lake City, has always been, and still is, foremost in the rank of mining districts of the Territory. Discoveries and locations were made as far back as 1865, but no particular action towards development was taken until the discovery of the rich and enormous deposits on the Emma lode in 1869 which gave an impetus to further research and subsequent bringing to light of other lodes and deposits considered to be equally promising. This district is now pretty well prospected and is dotted all over with claims and mines being developed and worked. The hill called Emma after the famous mine of that name is being burrowed in all directions by a net work of tunnels, some of which have produced very favorable results to the owners of them.

The class of ore is argentiferous galena mixed with carbonates.

The principal mines in the district are:

The Emma, Flagstaff, Montezuma, Savage, Davenport, Hiawatha, Last Chance, Wellington, Lexington, Grizzly, Matilda, Vallejo, Titus, Highland Chief, Enterprise, Frederick, North Star and Winsor.

The principal tunnels now being run are:—the Illinois, Gladiator, Howland, Etua, Ely, Herman, Bay City, Pacific, Victory, May & Excelsior and Brewer & Lapham.

Big Cottonwood District

Is also in the Wahsatch range of mountains, and situated about 25 miles southeast of Salt Lake City.

The first discoveries were made in the summer of 1870.

The principal mines are the Davenport, Reed & Benson, Highland Chief, Wellington, Richmond, Teresa, Prince of Wales, Congress, Maxwell, Mount King, Scott, Lady Elgin, Buckeye, Jr., Panacea and Imisio.

Also on Kesler's Peak, in the same district, are the Homeward Bound and Sailor Jack, belonging to the Deseret Mining Co., the Provo, belonging to Major Meeks, and the Noon, Home Ticket and Jefferson Tunnel, the property of J. J. Noon and associates.

The general character of the ores is carbonates of lead and galena, embracing antimonial, arsenical and argentiferous qualities.

The developments in the Highland Chief and Wellington mines are being made with an Ingersoll's patent steam drill. The rock is very hard limestone, with strata of flint and quartz.

Four feet of tunneling is excavated by the drill every 24 hours.

Parley's Park District,

Also in the same range, is distant about thirty-

three miles from Salt Lake City. Its position is on the divide between Parley's Park and Provo Valley, and consists of three districts known as the Howland, Uintah and Blue Ledge.

The first discoveries were made in the Howland in the summer of 1871. The principal mines in this district are the Flagstaff, Wild Bill and Rocky Bar.

In the fall of the same year the Pioneer and Idaho were located in Uintah District, and more recently the Gregory and Porcupine.

In the spring of 1872 the McHenry was discovered in the Blue Ledge District and created at the time some excitement, on account of the extensive croppings of rich milling ore.

About the same time the Ontario was located, and still later the Dolly Varden, Highland Jennie and Cariboo, all high grade galena ores that promise exceedingly well, the veins being large and the ores assaying well from the surface.

Character of ores, both smelting and milling.

American Fork District.

This district is southeast of and adjoins Little Cottonwood District. It is distant from Salt Lake City 34 miles by road via Little Cottonwood, and 40 miles by the Utah Southern and American Fork Railroads.

The majority of the ore is high grade smelting ore, composed of galena and carbonates, but there is some very fine free milling ore in the district, as for example, the Silver Gance, where large bodies of rich ore are exposed.

The principal mine in the district is the Miller, owned by Howland & Aspinwall of New York, who have erected extensive smelting works contiguous to it, which are called the Sultana Smelting Works. The company is also constructing a narrow-gauge railroad from the works to the U. S. Railroad, sixteen miles of which are already completed.

This mine and the Silver Gance are two of the most important mines in the Territory, consisting of immense bodies of ore of very high grade.

The names of other mines in the district are the Silver Gance (milling ore), the Bullion, Mary Ellen, Terrible, War Eagle, Queen of the West, Vermont, Pittsburgh and Wild Dutchman. West Mountain mining district, commonly known as

Bingham Canon District,

Is on the eastern slope of the Oquirrh range of mountains distant twenty-five miles southwest of Salt Lake City. It and its tributaries are situated in the core of the upheaval traversing Utah. The igneous rocks prevail in this district, and the leading mines already developed are situated in the granite formations.

The limestone formations crop out on the northwestern and southeastern extremities of the district, in which milling ores and the gray carbonate smelting ores are found in great abundance. But the largest, the most continuous and the most reliable veins are found in the granite formations.

There are four distinct belts of mineral running through this district. That of the two central belts is characterized as sulphuret, carbonate and oxide ores, assaying from 30 to 70 per cent. in lead, and from 20 to 300 ounces in silver per ton. The northwest belt is of a still higher grade of mineral; the gray carbonate ores generally prevailing, and varying in assay value from forty to one thousand ounces in silver per ton, and from ten to forty per cent. in lead. The southeast belt gradually diminishes in lead assay from the northwest towards the southeast side of the belt. The ores found in this belt are generally of the class known as milling ores, assaying in coin value from a few ounces to one thousand ounces in silver per ton.

Some valuable placer claims have been worked in the main portion of this canon which have yielded an aggregate of upwards of \$1,500,000.

The first discoveries were made in 1863, by soldiers attached to the command of General Connor. In 1865 Mr. Bottsford located the mines now owned by the Utah Silver Mining Company of London.

THE HEART OF THE MINES.—Gold Hill, Nevada, may be said to be the present great throbbing heart of the Comstock lode. Into a small space between the high hills on each side of and at the head of the canon are packed the hoisting-works of the leading mines of the county, and the rush and clatter of these never ceases. Steam-whistles shriek, car-loads of ore thunder down the chutes, and at times the place seems a second Pandemonium. To look upon the town from the hills above, these frosty mornings, the whole basin below, in which lies the town, seems a seething cauldron. Great white clouds of steam rise up everywhere, almost hiding the town from view. The trains almost hourly passing through the town over the railroad, also add not a little to the floating steam-clouds and to the general din and confusion. Below all this, however, the real work is being done. Far down under the town and far beyond the reach of the faintest echo of the shrillest locomotive whistle, hundreds of men are sweltering in an atmosphere but little cooler than that popularly supposed to characterize that of the regions ruled by his Internal Majesty. Here is where the real work is done, notwithstanding all the turmoil on the surface. It is a city beneath a city, and the wonders of the lower far surpass those of the upper city. Gold Hill is a busy place, not on the surface alone, but for 1,200 feet below—we run business into the ground here.—*Gold Hill News.*

SCIENTIFIC PROGRESS.

Changes in Coal by Exposure.

The subject of deterioration, which stone coal suffers by exposure, has, of late, attracted much attention. Different coals are not equally affected by exposure; their texture, their chemical composition, and the impurities which they contain, exercise considerable influence. Under otherwise equal conditions those coals suffer most which have little cohesive strength. Gas coals, after having been long stored, make less and poorer gas than when fresh from the mine.

The Nature of the Changes

Which take place with the coal, and the conditions which influence them, still form a fruitful field for investigation. A large number of interesting experiments on this subject were made by Dr. Richter, Professor at the mining school at Waldenburg, in Prussia, which deserve to be far more widely known than they appear to be. A detailed account of them may be found in *Dingler's Journal*, 1870. Some of his principal results have been stated substantially as follows: As soon as the coal is mined it begins to absorb oxygen, rapidly at first, then more slowly. At first this action appears to be physical, but it soon becomes chemical, when the absorbed oxygen combines with the hydrogen of the coal to form water, and with the carbon, to form carbonic acid. Heat intensifies the chemical action. Powdered stone coal fresh from the mine, heated to a temperature of 350° to 400° Fahr., increased in weight; although carbonic acid and aqueous vapor are disengaged, more weight of oxygen is absorbed. After a while a rather constant weight is obtained, and by chemical analysis, the coal is then found to contain oxygen and hydrogen very nearly in the relative proportion in which they combine to water, which has not been the case in the fresh coal. The property of the coal thus rapidly to absorb oxygen depends mainly upon its proportion of free hydrogen. Of the carbon of the coal only 5 or 6 per cent. combines thus rapidly with the oxygen at the stated temperature, while the rest of the carbon is far more stable.

Different coals heated to the boiling point of water until their weight remained constant, would absorb in a humid atmosphere, at 60° Fahr., from 2 to 7 per cent. of water, and it was remarkable to observe that some solid pitch coal would absorb three times as much water as a soft laminated coal. The faculty of absorption could not be judged from the appearance of the coal, but coals from the same stratum exhibited considerable uniformity of behavior. The coals which absorbed most water were also those which absorbed most oxygen. Twenty grammes coal absorbed in the first twenty-four hours after mining from 2 to 9 cubic centimeters oxygen. Stone coal absorbs carbonate acid even more eagerly than oxygen, taking up three times as much of it. At higher temperatures, the chemical action of the oxygen is increased and a slow combustion takes place.

Air dry coal absorbs the oxygen far more rapidly than moist coal, and coal which has been artificially dried absorbs it still more eagerly, taking up at the same time some nitrogen from the air. On the other hand, humidity induces decomposition of the iron sulphuret contained in most coals, which, in turn, accelerates the chemical changes of the coal by creating heat, by causing it to split and slack, and probably, also, by inducing chemical action between the oxid of iron formed and the coal, if not between the oxygen and coal directly.

Light appears to exercise little influence. When coal has been exposed some time, and absorbs oxygen with little avidity, this absorption is a little greater in the dark. These were the principal results obtained by Dr. Richter.

CAFFEINE.—Carefully conducted experiments prove that none of the active principle in coffee—caffeine—is lost by roasting the berry to a light brown color, and only 0.144 per cent., when roasted till almost black. Nearly all the caffeine was extracted in pouring boiling water over the burnt and ground coffee, scarcely a trace being found in the "grounds." The physiological action of caffeine on the system is very similar to that of strychnine. Some are more sensible to that poison, in minute doses, than others; hence the nervous action produced by coffee or tea on some systems, and the absence of any such effects on other systems into which the same amount of coffee or tea is taken.

DETERMINING THE ALCOHOLIC STRENGTH OF LIQUORS.—It is found that in pouring an alcoholic or acetic solution from a small orifice the drops are found to be large and heavier the more alcohol or acetic acid they contain. Hence it is apparent that if the number of drops required to make up a certain volume be counted, a table may be found to show the strength of the wine, beer or vinegar thus tested. The relative strength of any two or more liquors can thus be readily determined by ascertaining the number of drops required to fill any given vessel—say a small vial.

THE CABLE FOR SCIENCE.—Mr. Cytus W. Field has placed the cable at the free disposal of the scientist of both hemispheres, for the purpose of reporting the discovery of astronomical phenomenon, such as new discoveries of planets, comets, remarkable changes in the sun, etc.

Origin of Meteorites.

The question as to whence the meteorites come is one that we are not yet in a position to answer with certainty. The various hypotheses which suppose for them an origin in lunar volcanoes, or in our atmosphere, or, again, in a destroyed telluric satellite, or that would treat them as fragments of an original planet of which the asteroids are parts, or as masses ejected from the sun—all these hypotheses seem to be more or less precluded by the known velocities, the retrograde motion so frequently characterizing meteors and meteorites, or else by the chemical conditions that, for instance, are involved in the passage of the meteorite through the sun's chromosphere. Whether meteorites move or do not move in circum-solar orbits is at present impossible to say; hence, while with our incomplete knowledge we cannot to-day attach the character of periodicity to any known class of meteorites, we are not justified in founding any conclusion on a negative result with so limited a foundation.

But even if all or some of them may have been, on their encountering the earth, members temporarily or permanently of the solar system, we may with considerable probability consider them as having originally entered our system from the interstellar spaces beyond it. Such at least must be our conclusion if we are to admit the unity of the whole class of phenomena of meteorites and falling stars. For, since the orbits of the two best known meteoric streams, those, namely, of August and November, have been identified with the orbits of two comets, and since in regard to one of these (that of November) Leverier has shown, with great probability, that as a meteoric cloud it entered and became a member of our system only some 1,700 years ago, in consequence of the attractions of Uranus, while the August meteoric ring only differs in this respect from it, that it had at a much more remote period found an elliptic orbit around the sun—we are constrained, on the assumption with which we started, to recognize also in a meteorite a visitor from the regions of remote space. And so far as it goes, the observation by Secchi that the November falling stars exhibit the magnesium lines in harmony with this view.—*Popular Science Monthly*.

CHANGES IN THE MOON.—Mr. Birt, at the last meeting of the British Association, dealt with the observation of the spots on the floor of the crater Plato in the moon. It appears that changes in the appearance and luminosity of the streaks have been detected, and these changes are of such a character that they cannot be referred to changes of illumination, but depend upon some agency connected with the moon itself, while the color of the floor was found to vary as the sun ascended the lunar heavens, being darkest with the greatest solar altitude. The reports indicate a strong probability that definite changes of an interesting character on the moon's surface will be discovered.

FILIFORM, NATIVE SILVER.—How PRODUCED. Dr. J. H. Gladstone states that this peculiar formation of silver may result in nature from the action of sub-oxide of copper on silver salts in solution; deducing the above from the facts that when nitrate of silver is precipitated with sub-oxide of copper, the precipitate appears exactly similar, under the microscope, to native filiform silver, in white fillments, shooting in every direction, and twisted or doubled back in their course. Most of these threads are so fine that their diameter is only one-twenty-five-thousandths of an inch.

RED AND WHITE BLOOD.—Blood is not always white. There is a liquid formed in the bodies of invertebrates, which is really blood, though white in color. This white blood contains nearly as large a proportion of iron as red blood does. The proportion of iron in the blood of different animals is given as follows, by Pelouze:—In 100 grammes of blood metallic iron is found in

Man.	Beeves.	Pork.	Sheep.	Turkey.	Chicken.	Ducks.	Frogs
gms.	gms.	gms.	gms.	gms.	gms.	gms.	gms.
0.051	0.055	0.059	0.037	0.033	0.037	0.034	0.042
1.054	0.058	0.051	0.033	0.034	.....	.....	.....

CHANGE OF BRONZE BY LONG EXPOSURE.—*Dingler's Polytechnic Journal* describes a bronze instrument taken from a Celtic tomb, which was so disintegrated from long exposure as to present three quite distinct layers, as follows:—The first was CuS, indigo blue color and crystalline texture; the second was Cu²S, with 15 per cent. of tin; the third was Cu²S, 59.8 per cent., in a black, fine powder, tin 23.2 per cent., and 3.4 per cent. water.

VOLCANIC DUST.—The dust thrown up by Vesuvius during its recent eruption, has been ascertained to consist of aggregations of crystallized quartz dotted over with magnetic oxide of iron, also in a crystalline condition, and readily removable by hydrochloric acid. The grains were of microscopic dimensions, very uniform in size, and so small that they would readily pass through a sieve, the apparatus of which measured the 16,000th part of a square inch.

OZONE FROM SEA WATER.—The fact that the atmosphere at and near the sea shore is richer in ozone than it is in inland places has been explained by Mr. Corup Besanet, who finds by experiment that ozone is formed by the evaporation of water.

MECHANICAL PROGRESS.

Important Improvement in Fresco Painting.

The objection against wall paper and ordinary water color fresco painting is the instability of the colors, and the fact that they are not water-proof, and thus so easily damaged. In this respect the most expensive fresco is not better than the cheap wall paper. It may therefore be considered an important step in the progress of this most important art that, as we find stated in the *Manufacturer and Builder*, a Mr. Kemmer, of Newark, N. J., has devised an oil fresco painting, which is painted on a prepared sheet of muslin, and afterwards placed upon a wall like ordinary wall-paper. When so placed upon the wall it is said to be superior to the ordinary method of fresco painting. The use of scaffolding, expensive and cumbersome, in one's apartments for weeks at a stretch is avoided. The decorations can be designed according to order, executed in the shop, brought to the house, and put in place; and instead of the whole building being in confusion for weeks at a time, three or four days will suffice to complete the job. Moreover, better work can be done; the artist is not obliged to labor lying on his back or twisting his head into awkward and painful positions—often in the worst of lights.

Interior decoration is carried on principally during the summer months. Necessarily work is plentiful, skilled workmen are difficult to obtain and expenses are proportionately great. Using this process the labor can be done during the cold weather, when the best of artists are out of employment, and can be had at low wages.

Such a wall or ceiling may be washed like ordinary paint with soap and water, a proceeding which is impossible with common fresco work. The film, though thin, is elastic, and does not crack with the wall, unless very large openings appear which are generally few and susceptible of easy repair. The most elaborate designs can be prepared for any sized apartments.

The work, when finished, has all the appearance of, and in fact is, elaborate frescoing in oil, and besides being more durable and less expensive, it is equally artistic, and far more readily accomplished.

It will not peel off, as other ordinary fresco painting does so often, while the colors are very permanent, the gilding is not done with bronze powder or Dutch leaf, but with pure gold leaf, which, as well known, will retain its brilliancy, and may be washed with soap and water when put on with oil preparations, as is here the case.

Testing the Quality of Lubricating Oil.

Mr. R. H. Thurston, of Hoboken, N. J., has recently patented a device for testing the quality of lubricating oil. The invention, which affords a means of making a combined dynamometrical and thermometrical test, and also of determining, at the same time its power of sustaining heavy pressures and its durability under any required pressure, is described by the *Scientific American* as follows:

A journal, on a shaft running in a securely mounted frame, is grasped by a clamp and the boxes are set up to any desired intensity of pressure by a powerful screw compressing a spring; the pressure is known from the reading of a suitably arranged scale.

The pressure being adjusted as desired, the clamp swings about the journal and, by compressing a spring or by raising a weight, determines the exact amount of force required to overcome friction, by the reading of another scale.

A thermometer, set in the journal brass, indicates the commencement and progress of any heating of the journal. The time required to become heated and to burn off, under a given pressure, will indicate the durability of the oil where it may be exposed to such a pressure.

Several forms of machine are described for special classes of lubricants, as for heavy oils for locomotives, at the one extreme, and for the light oils used on sewing machines and other light machinery, at the other extreme.

PAPER WINDOW SHUTTERS.—The inventors who have been experimenting with paper for some time past, are now trying to make it useful for window shutters. The preparation used is the ordinary paper pulp brought by pressure to the utmost compactness and solidity, with the lightest possible sheet iron or rather casting to insure stability. This preparation has been brought to a high degree of perfection in Japan, where they are much more skillful in the uses of paper than we are, adapting it to all sorts of articles for domestic use, being, as it is claimed, water-proof, weather-proof, and fire-proof, not liable to breakage like crockery from careless handling, nor in danger of corrosion like most of the metals from exposure. The material has been used to some extent in this country for furniture, clothing, car-wheels, and many other things out of the ordinary course of things. As the stuff will not burn, the inventors expect to turn it to use as a new safeguard against fire.

Friction of Journals.

A correspondent writing from Columbus, Ohio, asks whether the friction of a large journal is greater than that of a small one, the length and character of bearing being the same in both cases, and the number of revolutions the same, the only difference being in the diameter of the journal.

The friction on any surface, whether plane or cylindrical, is proportional to the weight resting upon it and is not at all affected by the area of the rubbing surface, provided the pressure is not so great, on the one hand, as to change the character of those surfaces, nor so light on the other hand, as to make the resistance principally that of viscosity of the lubricant rather than that of true friction. In the former case, the friction may increase immensely in consequence of the cutting of the surface; and, in the latter, the increase of frictional resistance will be approximately proportional to the increase of area.

The work done in any given time, that is, the power wasted in turning any journal on its bearings, is, where the fractional resistance is the same, proportional to the speed of the rubbing surfaces, since it is measured by the product of the resistance into the distance through which that resistance is overcome. Therefore, it follows that a very large journal absorbs a larger proportion of the driving power of a machine than does one of small diameter, and in designing machinery we should make journals of as small diameter as possible without danger of breaking the shaft, or of causing abrasion of the rubbing surfaces.

Again, the tendency of a journal to heat is the greater the greater the pressure per square inch of longitudinal section of the journal, and it is increased by increasing the speed of the rubbing surfaces. Therefore, to make journals safe against heating, make them of as small diameter as safety permits; and having thus reduced their absorption of power to the lowest limit, secure bearing surface by giving them ample length. If they are, however, made so long that the shaft can spring in the journal, heating may occur from that cause; in line shafting, this will, of course, not happen. The best practice gives line shafting for mills a length of journal equal to four times the diameter of the shaft.

There are rules, known to engineers, for properly designing journals, which are based on the principles above stated.

In no case in general practice should the pressure, on even the slowest moving journals, be allowed to exceed 1,000 pounds per square inch of longitudinal section with steel journals or about 600 on iron, running in well worn boxes in each case. Special care should always be taken to provide for effective lubrication.—*Sci. Am.*

Tidal Water Power; A New and Useful Suggestion.

Mr. A. E. Gordon, the editor of the New Brunswick, N. J., *Times*, has made a suggestion in reference to the utilizing of the power of the tides, which, says the *Scientific American*, appears to us not only novel but practical and important.

The use of tidal water power to drive mills is common along our coasts. The ordinary method is to shut off the mouth of a small inlet by means of a dam having sluice gates to admit the sea water which, by the rise of the tide enters and fills the enclosure. By the fall of the tide the enclosed water derives sufficient head to drive a turbine or other wheel, and so give motion to the mill. But when the tide again rises of course the head is destroyed, so that the mill can only run alternately, during two separate periods of a few hours each out of the twenty-four. It is this alternating and irregularity in the hours of motion, together with the periods of entire inactivity, that prevent the employment of this species of motive power for general industrial purposes.

The improvement suggested by Mr. Gordon consists in providing two water basins, both of which are to be shut off by dams from the sea. One of the basins is to serve as a constant supply reservoir of water, and it is to have a close dam of such width and height that the tide water, when it has risen to within one foot of its normal height, will begin to pour over the dam and quickly fill the reservoir. The dam of the other basin is to be provided with swing valves which permit exit of the water at low tide but prevent ingress of water from the sea. This basin, we will now suppose to be empty. The water wheel is to be placed between the two basins, and the fall of the water from the reservoir into the discharge basin will afford continuous motive power so long as the supply of water lasts and until the rise of water in the discharge basin destroys the head. But as this latter basin is entirely emptied at every tide, the head will always keep good, precluding, of course, that the reservoir and the discharge basin are made of proper size. In respect to this last point, it is well known that basin capacity on our coasts is almost unlimited and there are thousands of localities where extensive water powers may be thus provided and maintained at a comparatively small cost. We trust that Mr. Gordon will proceed to elaborate his plan and place it before the hydraulic engineers of the country for discussion.

Stock Sales for Week Ending Jan. 30—S. F. Stock & Ex. Board.

Names of Companies.	Shs. Sold.	Friday.	Saturday.	Monday.	Tuesday.	Wednesday.	Thursday.	Total.
Prices.	Prices.	Prices.	Prices.	Prices.	Prices.	Prices.	Prices.	Prices.
Adams Hill.	150	50c	50c	50c	50c	50c	50c	50c
Alpha.	200	37 1/2	37 1/2	37 1/2	37 1/2	37 1/2	37 1/2	37 1/2
American Flag.	2500	11 1/2	11 1/2	11 1/2	11 1/2	11 1/2	11 1/2	11 1/2
Amador Tns.	100	10	10	10	10	10	10	10
Aransas.	100	10	10	10	10	10	10	10
Arizona & Utah.	100	10	10	10	10	10	10	10
Belcher.	100	10	10	10	10	10	10	10
Baltimore Con.	100	10	10	10	10	10	10	10
Bowery.	100	10	10	10	10	10	10	10
Bacon.	100	10	10	10	10	10	10	10
Buckeye.	100	10	10	10	10	10	10	10
Best & Belcher.	100	10	10	10	10	10	10	10
Belmont.	100	10	10	10	10	10	10	10
Chollar.	100	10	10	10	10	10	10	10
Caledonia.	100	10	10	10	10	10	10	10
Cons. Virg. Ia.	100	10	10	10	10	10	10	10
Confidence.	100	10	10	10	10	10	10	10
Crown Point.	100	10	10	10	10	10	10	10
Central.	100	10	10	10	10	10	10	10
Calaveras.	100	10	10	10	10	10	10	10
Conductor.	100	10	10	10	10	10	10	10
Columbo.	100	10	10	10	10	10	10	10
Chief of the Hill.	100	10	10	10	10	10	10	10
Chief East Ex.	100	10	10	10	10	10	10	10
Cederburg.	100	10	10	10	10	10	10	10
Consolidated.	100	10	10	10	10	10	10	10
Danby.	100	10	10	10	10	10	10	10
Eureka Cons.	100	10	10	10	10	10	10	10
Eureka.	100	10	10	10	10	10	10	10
Everett.	100	10	10	10	10	10	10	10
Empire.	100	10	10	10	10	10	10	10
Empire Mill.	100	10	10	10	10	10	10	10
Excelsior.	100	10	10	10	10	10	10	10
Gold & Curry.	100	10	10	10	10	10	10	10
Golden Chariot.	100	10	10	10	10	10	10	10
Globe.	100	10	10	10	10	10	10	10
Hale & Norcross.	100	10	10	10	10	10	10	10
Hahn & Hunt.	100	10	10	10	10	10	10	10
Hermes.	100	10	10	10	10	10	10	10
Ida Elmore.	100	10	10	10	10	10	10	10
Imperial.	100	10	10	10	10	10	10	10
Ingot.	100	10	10	10	10	10	10	10
Independent.	100	10	10	10	10	10	10	10
Ivanhoe.	100	10	10	10	10	10	10	10
Jules.	100	10	10	10	10	10	10	10
Justice.	100	10	10	10	10	10	10	10
Kentucky.	100	10	10	10	10	10	10	10
Kentucky.	100	10	10	10	10	10	10	10
Knickerbocker.	100	10	10	10	10	10	10	10
Mammoth.	100	10	10	10	10	10	10	10
Meadow Valley.	100	10	10	10	10	10	10	10
Mahogany.	100	10	10	10	10	10	10	10
Mining Bldg.	100	10	10	10	10	10	10	10
McMahon.	100	10	10	10	10	10	10	10
Monitor Belmont.	100	10	10	10	10	10	10	10
Newark.	100	10	10	10	10	10	10	10
Ohio.	100	10	10	10	10	10	10	10
O. H. Treasure.	100	10	10	10	10	10	10	10
Overman.	100	10	10	10	10	10	10	10
Occidental.	100	10	10	10	10	10	10	10
Pioche.	100	10	10	10	10	10	10	10
Pioche West.	100	10	10	10	10	10	10	10
Pioche Phoenix.	100	10	10	10	10	10	10	10
Page & Pines.	100	10	10	10	10	10	10	10
Pea Vine.	100	10	10	10	10	10	10	10
Phoenix.	100	10	10	10	10	10	10	10
Raymond & Ely.	100	10	10	10	10	10	10	10
Savage.	100	10	10	10	10	10	10	10
Sig. Belcher.	100	10	10	10	10	10	10	10
Sierra Nevada.	100	10	10	10	10	10	10	10
Sentinel.	100	10	10	10	10	10	10	10
Sonor.	100	10	10	10	10	10	10	10
Silver Hill.	100	10	10	10	10	10	10	10
Silver Peak.	100	10	10	10	10	10	10	10
South Chariot.	100	10	10	10	10	10	10	10
Trench.	100	10	10	10	10	10	10	10
Teutoburg.	100	10	10	10	10	10	10	10
Wash. & Crooks.	100	10	10	10	10	10	10	10
Ward.	100	10	10	10	10	10	10	10
War Eagle.	100	10	10	10	10	10	10	10
Utah.	100	10	10	10	10	10	10	10
Yellow Jacket.	100	10	10	10	10	10	10	10
Yuba Gravel.	100	10	10	10	10	10	10	10

NOTE.—California. *—Washoe. †—White Pine. ‡—Ely District. §—Eureka District. ||—Idaho. ¶—Idaho. —Over.

Our Weekly Stock Review.

[S. F. Stock and Exchange Board.]

THURSDAY EVENING, Jan. 30, 1873.

Mining stocks have not been very lively this week although at the latter part of it they began to look up. News from all the mines is unusually bright, however, as will be seen by reference to our Mining Summary. The depression in stocks still continues, which is supposed to be the result of tightness in the money market, and as a contemporary justly remarks, in the greatly increased number of shares afloat. Not only are more stocks dealt in, but many of the companies have lately increased their number of shares to a great extent, and more stock is offering than the market warrants. Moreover a large number of assessments have become delinquent and have been levied this month, as will be seen from the statement below. Some 24 assessments were delinquent in January, the aggregate amount of which was \$550,000, while the dividends were \$575,691, leaving a balance of only \$25,000 for the month. Dividends this month were more numerous than they have been for some time, two new companies having been added to the list of dividend-paying mines—the Diana and Consolidated Amador. The Cederburg has declared a dividend of 50 cents a share, which, however, is not payable until February.

The amount disbursed this month is larger than it has been since July. In May \$1,067,000 was paid; in June, \$882,000; in July, \$852,000; in August, \$557,000; in September, \$522,000; in October, \$210,000; in November, \$225,000; in December, \$230,000 and in January \$575,691—making since May last the sum of \$5,120,781. The assessments in that time amounted to \$3,874,760, leaving a difference of \$1,246,021 as net profit.

The total dividends on mining stocks for the year 1872, amounted to \$6,731,400, and in 1871, amounted to \$4,837,950 showing an increase of \$1,893,450. The Amador, Golden Chariot, Eureka Consolidated, Greenville, Hale & Norcross, Redington, Quicksilver, Sierra Nevada, Succor and Yellow Jacket, which paid dividends in 1871, did not pay any in 1872. The companies paying dividends in 1872 were as follows, with the total amount paid: January, Belcher, \$2,140,000; Caledonia, \$36,000; Chollar-Potosi, \$50,000; Crown Point, \$1,800,000; Eureka, \$40,000; Keystone, \$20,000; Mahogany, \$15,000; Meadow Valley, \$36,000; North Star, \$22,000; Pioche, \$40,000; Providence, \$31,000; Raymond & Ely, \$2,070,000; Yuba Gravel, \$10,000.

The following companies levied assessments during the month of January: Amelia, Ely District, 10 cents; Arkansas, Ely District, 50 cents; Anthony, Ely District, 25 cents; Buckeye, Washoe, \$1; Chief of the Hill, Ely District, 50 cents; Dauphin, Butte Co., 40 cents; Danby, Washoe, 25 cents; Eagle Quicksilver, Santa Barbara Co., \$5; Empire, Idaho, \$1; Empire, Washoe, 50 cents; Equitable Tunnel, Utah, 10 cents; Globe, Washoe, \$1; Golden Chariot, Idaho, \$2.60; Granite Tunnel, El Dorado Co.,

6 cents; Ida Elmore, Idaho, \$2.50; Imperial, Washoe, \$1; Jackson, Eureka, 10 cents; Juniata, Esmeralda Co., Nov., 65 cents; Lady Esten Tunnel, Utah, 5 cents; La Paz, Ely District, 50 cents; Lillian Hall, Ely District, 25 cents; McMahon, Seboll Creek, 25 cents; Meadow Valley, East Co., Ely District, 10 cents; Minnesota, Idaho, \$1; Mobave Cone, Arizona, 10 cents; Noonday, White Pine, 10 cents; Newark, Ely District, 50 cents; Old Providence, California, 25 cents; Ophir, Washoe, \$3; Occidental, White Pine, 5 cents; Phoenix, Eureka, 10 cents; Peavine, Ely District, 25 cents; Railroad Cone, Nevada, 15 cents; Rising Star, Idaho, \$1; Rising Star, Eureka District, 15 cents; Sanderson, California, 10 cents; Savage, Washoe, 10; Santa Cruz Coal Company, California, 20 cents; Setting Sun, Ely District, 30 cents; Spring Mount, Nevada, 20 cents; Stanford, Nevada, 10 cents; Teutoburg, Cal., 25 cents; Teutoburg, Teutoburg, Cal., \$1; Washington and Creole, Ely District, 50 cents; Yellow Jacket, Washoe, \$5; Yuba Gravel, Cal., 25 cents.

The following is a list of assessments delinquent in January:

Name.	Per Share.	Amount.	Delinquent.
Arizona & Utah.	\$1.00	\$18,000	January 10
Adams Hill Co.	25	15,000	January 22
Consolidated Virginia	30	70,000	January 20
Esta Buena Con.	25	7,500	January 22
Hale & Norcross.	5.00	80,000	January 15
Justice.	1.00	21,000	January 14
Kentucky.	10.00	20,000	January 15
Kentucky.	10	15,000	January 11
Magnolia.	25	7,500	January 15
National.	50	15,000	January 31
Orient.	25	5,000	January 3
Overman.	5.00	64,000	January 25
Petticoat.	50	10,000	January 20
Pioche West Ex.	25	8,750	January 27
Red Jacket.	10	5,200	January 10
Silver Hill.	2.00	10,000	January 23
Silver Peak.	50	15,000	January 11
South Chariot.	60	10,000	January 6
Succor.	1.00	29,000	January 6
Summit.	25	2,800	January 20
Star King.	50	15,000	January 30
Union Gravel.	1.50	12,000	January 25
Yuba Gravel.	20	2,000	January 18
The dividends paid in January from mining companies amounted to \$575,691, against \$371,000 paid in the same month in 1871, and \$337,000 in 1870. Dividends in January were as follows:			
Name.	Per Share.	Amount.	
Belcher.	53	\$312,000	
Consolidated Amador.	3	30,000	
Eureka.	1	1,151	
Meadow Valley.	1	20,000	
Raymond & Ely.	1	60,000	
Eastport Cons. Bay Coal.	1	150,000	
Total.		\$575,691	

On Friday the Stock Market was weak and prices irregular. On Saturday morning it was still dull and heavy, with a decline in prices, but showed a slight improvement in the afternoon. Broker fall \$1; Crown Point, \$1; Con. Virginia, \$3; Caledonia, \$1; Gould & Curry, \$1; Hale & Norcross, \$7; Pioche, \$1; Overman, \$6; Savage, \$6; and Yellow Jacket, \$4.

Monday there was no change in the market, everything being very dull and Tuesday it was the same.

Wednesday some little activity manifested itself and prices were a little better. Crown Point rose \$2.50; Chollar, \$1; Con. Virginia, \$3; Hale & Norcross, \$4; Overman, \$2; Jacket, \$5; Raymond & Ely, \$3.

Below will be found items of interest from prominent mines later than that in our Mining Summary.

KENTUCKY.—On the 20th two bars of bullion were shipped, worth \$4,463. About 20 tons per day coming from old level.

OUR MINING SHAREHOLDERS' DIRECTORY.

[COLLATED WEEKLY FROM ALL NOTICES ADVERTISED IN S. F. JOURNALS.]

ASSESSMENTS.							
Name of Co.	Location.	Secretary.	S.F. Office.	Assm't. Levied.	Delinq't.	Sale.	
Adams Hill Con. M. Co.	Eureka Dist.	W. W. Taylor.	414 California St.	25	Dec. 23	Jan. 28	Feb. 14
ADMIRAL NELSON T. & M. Co.	Utah.	R. H. Sinton. Room No.	Monte's B'k'.	10	Jan. 27	Mar. 4	Mar. 31
ADRIAN & S. M. CO.	Ely District.	J. H. Applegate.	609 Sacramento St.	1	Feb. 1	Feb. 28	Mar. 1
Amelia S. M. Co.	Ely District.	L. Kaplan.	Merchants' Ex.	10	Jan. 3	Feb. 8	Mar. 1
Anthony G. M. Co.	Placer Co., Cal.	W. I. Kip Jr.	41½ Cal. St.	25	Jan. 29	Mar. 4	Mar. 20
ARKANSAS M. CO.	Ely District.	J. H. Applegate.	723 Montgomery St.	60	Jan. 15	Feb. 26	Mar. 22
Buckeye & S. M. Co.	Washoe.	J. E. Lightner.	419 California St.	1	Feb. 2	Feb. 28	Mar. 20
Cederburg First South Ex. M. Co.	Cal.	J. N. Webster.		5	Dec. 27	Feb. 28	Mar. 30
Chapman M. & M. Co.	Ely District.	F. Swift.	419 Montgomery St.	25	Dec. 12	Jan. 20	Feb. 12
Chief of the Hill M. Co.	Ely District.	C. S. Neal.	402 Montgomery St.	25	Dec. 13	Jan. 20	Feb. 12
Cons. Virg. Ia.	Washoe.	D. T. Bagley.	441 California St.	3	Dec. 16	Jan. 20	Feb. 13
CORDELLER & G. S. M. CO.	Mexico.	Henry M. Reed.	321 Washington St.	15	Dec. 21	Jan. 21	Feb. 13
Dancy & S. M. Co.	Nevada.	G. K. Spinnay.	320 Cal. St.	25	Jan. 24	Feb. 28	Mar. 10
DAUPHIN M. CO.	Butte Co., Cal.	C. F. Balcom.	426 Montgomery St.	50	Jan. 24	Feb. 28	Mar. 10
EAGLE Q. M. Co.	Santa Barbara Co.	Wm. H. Watson.	402 Montgomery St.	1	Jan. 18	Mar. 19	Mar. 24
EMPIRE M. CO.	Idaho.	C. F. Balcom.	426 Montgomery St.	50	Jan. 6	Feb. 15	Mar. 8
EMPIRE M. & M. Co.	Washoe.	G. S. Spinnay.	320 California St.	50	Jan. 22	Feb. 11	Mar. 10
Equitable T. & M. Co.	Utah.	C. S. Healy.	Merchants' Exchange.	25	Dec. 22	Feb. 11	Mar. 10
Esta Buena Con. S. M. Co.	Nevada.	A. Noel.	419 California St.	25	Dec. 16	Jan. 22	Feb. 12
Globe M. & M. Co.	Idaho.	W. E. Dean.	419 California St.	1	Jan. 7	Feb. 10	Mar. 4
Golden Chariot M. Co.	Nevada Co., Cal.	C. O. Palmer.	Market and Spear Sts.	10	Dec. 30	Feb. 10	Feb. 25
GRANITE TUNNEL M. CO.	Cal.	W. O. Holmes.	441 Cal. St.	6	Jan. 17	Feb. 11	Mar. 14
Green Valley Blue G. Co.	Idaho.	A. D. Carpenter.	Merchants' Ex.	25	Dec. 12	Jan. 21	Feb. 13
Hale & Norcross S. M. Co.	Washoe.	J. E. Lightner.	438 California St.	5	Dec. 12	Jan. 15	Feb. 13
Hope Gravel M. Co.	Grass Valley.	L. Kaplan.	Merchants' Exchange.	50	Jan. 17	Feb. 20	Mar. 10
Ida Elmore.	Idaho.	Wm. Willis.	419 Cal. St.	2	Jan. 23	Feb. 20	Mar. 20
IMPERIAL S. M. CO.	Washoe.	D. T. Bagley.	331 Montgomery St.	1	Dec. 12	Jan. 19	Feb. 18
IVANHOE S. M. CO.	Eureka District.	H. C. Kibbe.	419 Cal. St.	10	Jan. 23	Feb. 26	Mar. 18
JACKSON M. CO.	Washoe.	J. H. Taylor.	414 California St.	5	Dec. 13	Jan. 17	Feb. 3
Jewett G. & S. M. Co.	San Luis Obispo.	G. Staacke.	305 Sansome St.	2	Jan. 2	Feb. 1	Feb. 3
JOHNSTON & S. M. CO.	Esmeralda Co., Nev.	C. S. Neal.	402 Montgomery St.	65	Jan. 17	Feb. 24	Mar. 17
JUSTICE M. CO.	Washoe.	R. Wegener.	414 California St.	10	Dec. 11	Jan. 14	Feb. 4
Kentucky M. Co.	Ely District.	J. P. C. Vallier.	509 California St.	1	Dec. 12	Jan. 15	Feb. 6
Kentucky & S. M. Co.	Ely District.	C. A. D. Carpenter.	Merchants' Ex.	25	Dec. 12	Jan. 11	Feb. 3
Lady Emma M. Co.	Cal.	S. H. Haly.	Merchants' Ex.	5	Jan. 13	Feb. 13	Mar. 1
Lady E. Ten T. & M. Co.	Utah.	J. E. Lightner.	419 California St.	30	Jan. 23	Mar. 3	Mar. 29
La Paz M. Co.	Ely District.	D. T. Bagley.	401 Cal. St.	25	Jan. 23	Mar. 3	Mar. 29
Lillian Hall M. Co.	Ely District.	D. T. Bagley.	401 Cal. St.	10	Dec. 17	Jan. 22	Feb. 10
Magnolia S. M. Co.	Eureka Dist.	L. Kaplan.	Merchants' Ex.	25	Jan. 9	Feb. 13	Mar. 10
McMahon M. Co.	Schell Creek.	R. K. Spinnay.	320 California St.	25	Jan. 9	Feb. 13	Mar. 10
MEADOW VALLEY EAST EX. M. CO.	W. W. Colburn.	419 California St.	10	Jan. 15	Feb. 25	Mar. 21	*
Minnesota G. & S. M. Co.	Idaho.	Wm. Willis.	419 California St.	10	Jan. 20	Feb. 21	Mar. 18
MOHAVE CON. G. & S. M. Co.	Cal.	J. E. Lightner.	507 Montgomery St.	15	Jan. 7	Feb. 10	Mar. 10
MOUNTAIN VIEW M. & M. CO.	Cal.	W. O. Holmes.	419 California St.	15	Jan. 13	Jan. 27	Feb. 17
Newark M. Co.	Ely District.	D. T. Bagley.	401 Cal. St.	50	Jan. 27	Mar. 7	April 2
Newman Booth Con. M. Co.	Ely Dist.	W. E. Lamb.	314 California St.	25	Dec. 30	Feb. 1	Feb. 21
NOONDAY S. M. CO.	White Pine Co.	J. A. McCall.	419 California St.	25	Dec. 14	Feb. 1	Feb. 21
OLD FORT S. & S. M. Co.	White Pine.	J. A. McCall.	414 Monterey St.	5	Jan. 21	Feb. 25	Mar. 14
Old Providence M. & M. Co.	California.	F. Swift.	415 Montgomery St.	25	Jan. 11	Feb. 12	Mar. 4
Ophir S. M. Co.	Washoe.	Jos. Marks.	Merchants' Exchange.	30	Jan. 27	Mar. 4	Mar. 24
ORANGE & G. M. CO.	Placer Co.	D. T. Bagley.	402 Montgomery St.	5	Dec. 10	Jan. 20	Feb. 10
Orcutt M. M. Co.	Washoe.	W. W. Watson.	414 California St.	5	Dec. 21	Jan. 25	Feb. 12
Pacific Box Co.	Esmeralda Nev.	E. Lenha.	507 Montgomery St.	25	Dec. 31	Jan. 30	Feb. 15
Peavine S. M. Co.	Ely District.	C. F. Balcom.	426 Montgomery St.	25	Jan. 28	Mar. 5	Mar. 20
Pine Bluffs M. Co.	Cal.	F. J. Fishner.	419 California St.	50	Dec. 18	Jan. 20	Feb. 12
Pioche West Ex. M. Co.	Ely Dist.	T. W. Colburn.	419 California St.	25	Dec. 18	Jan. 27	Feb. 24
Phoenix S. M. Co.	Eureka District.	J. Mascure.	419 California St.	50	Jan. 7	Feb. 13	Mar. 5
QUAIL HILL & W. CO.	Idaho.	J. E. Lightner.	419 California St.	10	Jan. 14	Feb. 14	Mar. 10
RAIDING & M. CO.	Nevada.	Jos. P. Nourse.	328 Montgomery St.	15	Jan. 7	Feb. 13	Mar. 20
Rising S. R.	Idaho.	Wm. Willis.	419 California St.	1	Jan. 9	Feb. 15	Mar. 12
Rising Star.	Eureka Dist.	J. M. Buffington.	Merchants' Ex.	15	Jan. 15	Feb. 13	Mar. 8
SAVANNAH G. M. CO.	Washoe.	C. B. Holmes.	419 California St.	10	Jan. 6	Feb. 7	Feb. 28
Savannah Co.	Cal.	L. Kaplan.	Merchants' Ex.	20	Jan. 9	Feb. 15	Mar. 15
Savannah Cruz Coal M. Co.	Ely District.	Henry Boyle.	Stevens' Bldg.	2	Dec. 28	Jan. 28	Feb. 22
Sitting Spring G. M. Co.	Idaho.	J. E. Lightner.	419 California St.	2	Dec. 28	Jan. 28	Feb. 22
South of the Hill M. Co.	Idaho.	J. L. King.	411 California St.	50	Nov. 27	Jan. 6	Jan. 27
SPRING MOUNT M. CO.	Nevada.	T. W. Colburn.	419 California St.	25	Nov. 15	Jan. 25	Mar. 21
SPRING MOUNT M. CO.	Nevada.	T. W. Colburn.	419 California St.	25	Nov. 15	Jan. 25	Mar. 21
ST. JAMES M. CO.	Nevada.	Chas. H. Fish.	419 California St.	10	Jan. 3	Feb. 8	Mar. 3
STATE OF MAINE M. & M. CO.	Cal.	H. B. Coudon.	306 Montgomery St.	5	Jan. 23	Feb. 24	Mar. 17
Star King S. M. Co.	Idaho.	L. Kaplan.	Merchants' Ex.	50	Dec. 26	Jan. 31	Feb. 19
Summit M. Co.	Amador Co.	J. M. Buffington.	734 Montgomery St.	1	Dec. 20	Jan. 20	Feb. 10
Summit & G. & G. M. Co.	Cal.	F. J. Hermann.	418 Keweenaw St.	20	Jan. 8	Feb. 12	Mar. 3
Tahoe Mountain M. & M. Co.	California.	D. F. Verdenal.	538 Clay St.	1	Jan. 2	Feb. 1	Feb. 10
Union Gravel M. Co.	Cal.	T. D. Berly.	320 Sansome St.	1	Dec. 25	Jan. 20	Feb. 10
VALLEY VIEW M. CO.	Cal.	H. B. Coudon.	318 California St.	2	Dec. 11	Jan. 20	Feb. 10
Washington & Creule M. Co.	Ely Dist.	F. D. Cleary.	419 California St.	50	Jan. 22	Mar. 6	Apr. 3
WASHINGTON Q. M. CO.	Cal.	H. B. Coudon.	306 Montgomery St.	5	Jan. 16	Feb. 4	Mar. 17
Yellow Jacket M. Co.	California.	R. H. Walcott.	103 Battery St.	5	Jan. 4	Feb. 24	Mar. 11
YULE GRAVEL M. CO.	Cal.	Wm. H. Watson.	301 Montgomery St.	20	Dec. 18	Jan. 18	Feb. 10

main shaft of the Petticoat is to be sunk 100 ft. deeper to strike a new chimney which is supposed to be dipping towards the shaft, from the south. Some stoping is being done in the 450-ft. north level. The Prussian Hill was sold at Sheriff's sale for \$6,000. Canse, an incompetent, penny wise and pound foolish Superintendent. Additional improvements, with a view to convenience, have been completed at the Sanderson mine. The Supt. is again master of the water in the main shaft; stoping and sinking have been resumed.

Mosquito District.—The Supt. of the Good Hope has been crushing low grade ore from the mine to ascertain its value. The mill is in excellent working order, now, and is very favorably situated for custom purposes—quite a number of strong veins, from 2 to 9 ft. wide, being worked within a radius of less than 1 mile. The Dolly Varden, which suspended operations during the recent rains, has resumed work. The main shaft is now 100 ft. deep. The owners intend to test the mine extensively before going to any expense for permanent purposes. The Grassopper is idle. The mine requires heavier machinery, a new shaft and a systematic mode of working.

West Point District.—A lot of ore from a vein near Big Flat, yielded \$40 per ton. The ore resembles granite, although the fissure is large and well defined. The Lone Star mine exhibits one of the most extensive and valuable bodies of pay ore ever seen in this district. The vein at the face of the tunnel, now, is 9 ft. wide and there is still good quartz in sight towards the foot wall. The ore will probably average \$40 per ton. The Zacateno and Bartolo mines, which never yielded less than expenses to say description of economical working for the past 20 years are idle; although both mines have larger quantities of high grade ore exposed in their respective shafts, to-day than ever before. The tunnel of Joe Griggs & Co., intended to drain the water from two veins at the depth of 100 ft. is in 400 ft. 100 ft. further will tap the nearest. These 2 parallel fissures were extensively gouged in early times, yielding large profits. Experienced underground miners are very much needed in this section.

EL DORADO.

St. Lawrence Mine and Mill.—Placerville Democrat, Jan. 25: Last Monday we visited and inspected this mill and mine, situated near Columbia Flat, about 7 miles north of this city. Twenty stamps are kept constantly in motion, crushing about 30 tons per day, the motive power being furnished by an engine of 60-horse power, the working of which causes not the slightest jar or tremor in the engine room. The motive power of the hoisting works is furnished by a smaller engine, another beauty, that runs like clockwork. Under the same roof with the hoisting works is the blacksmith shop, and a creditable innovation and great convenience in the shape of a complete sawmill, with circular saw, logway, carriage, etc., for sawing into shafting lumber, timber, etc., the logs which lie on the natural incline just above. The shaft follows the ledge, pitching east at an angle of about 22½ degrees more or less. Passing the 3 upper levels, one at a 115 ft., one at 200 ft., one at 300 ft. from the surface; our first stoppage was at the 400-ft. level. Here we found a drift running north about 130 ft., along a ledge that at this point is fully 6 ft. thick, beautifully ribboned, with a rich sprinkling of free gold throughout its entire extent. Thence we again descended the shaft, which is being sunk by contract and had, at the time of our visit, reached a depth of 32 ft. below the 400-ft. level, and is being sunk at the rate of about 1½ ft. per day. At this point the ledge has widened to nearly 8 ft., with walls, as above, as smooth as glass, and a splendid gouge over a ft. wide, an unmistakable improvement in the quartz, and the foot wall dropping away until its descent was almost vertical. At the surface the quartz yielded hardly more than \$8 per ton as an average; down to the 200 ft. level not more than \$12 to \$15 per ton; now it is averaging very nearly, if not quite, \$30 per ton, and they are working everything from wall to wall.

NEVADA COUTY.

RICH BOULDER.—Nevada Transcript, Jan. 23: It was reported from North San Juan, that on the Ridge, a boulder of gold weighing over 240 pounds, and worth \$50,000, was found in the claims of Yo Yen & Co., at Moore's Flat, on Tuesday afternoon last. These claims were bought by a Chinese Co. who are engaged in running a deep tunnel and employ about 20 men. The claims always paid well and are known as the old Dowling claims.

DABS OF GOLD.—Grass Valley Union, Jan. 28: The Idaho made a 4-days run of the mill, with 35 stamps, last week, and cleaned up about \$20,000. That gives for 10 days \$42,000 without counting sulphurets.

EUREKA for 6 days, with 10 stamps running, gives \$10,500.

DAISY HILL had crushed last week, 69 tons of rock which yielded \$2,898, or \$42 to the ton. The ore in the mine has steadily increased in value for the last week.

SLATE LEDGE MINE (Perrins's) has cleaned from plates, after five days run, about \$2,000. The batteries were not touched in the clean up.

PLACER COUNTY.

OUR MINES.—Cor. Placer Herald, Jan. 25: The town of Gold Run has a neat, well-to-do appearance, and a population of from 600 to 700. A short ramble in a westerly direction and on a line of the numerous ditches gives you a fine view of hydraulic mining. From the stand point which I fortunately chose, the claims of the "Home Ticket," "Gold Run," "Harriman & Taylor," "Union," and "Pacific" were

spread out to view, in which I counted, I think, about a dozen huge streams of water playing upon the banks. The Mallory cement mill is engaged in crushing blue gravel, which, I am told, is paying a handsome profit to its owners. The "Home Ticket Claims," were using 2 streams of about 500 inches of water against the bank. This claim is one of many owned by the Cedar Creek Gold Mines and Water Co. A little to the south lie the "Gold Run Claims," using 2 streams of about 740 inches of water. About a mile below the Miner's Ditch Co. are running a bed-rock tunnel through very hard rim rock (trap rock) by the aid of an improved drill, costing in the neighborhood of \$800. Between the towns of Gold Run and Dutch Flat lie the "Pacific Claims." Immediately adjoining the "Pacific" are the "Union Claims." These claims are nearly exhausted on the upper stoping. Approaching Dutch Flat, you may glance at the "Central Claims" lying just below the depot. These claims are now being opened, but are not yet in working order. The "Big" and "Little Pine Tops," adjoining the "Central," are finely fitted up for a winter's campaign, but have not yet made a fair start. The "Jehoshaphat" has nearly completed a "run." The "Enterprise" and "Deep Shaft" have nearly completed their opening runs. The shaft 87 feet in depth has been sunk in these claims, and drifts are now being run east and west to test their richness of the lower strata of gravel.

COON.—Placer Argus, Jan. 25: This is a new ledge recently located on Bald Hill near the Green. A shaft has been sunk about 40 ft., the rock from which paid about \$800. A north drift is being run with rock looking fine.

CHATER HILL.—This mine is being worked by the St. Patrick Co.; they have completed the erection of their steam hoisting works and are getting out very rich rock.

RICH STRIKE.—About 10 days ago, two brothers located a quartz ledge near Humburg Flat, in Township No. 2, and commenced working the same. They sunk a shaft about 12 ft., and then started a drift, the second day's work in the drift revealed to their astonished gaze one of the richest pockets that has ever been discovered in this section of the country. They have taken out over \$4,000 in specimens, and the rock now remaining in sight is literally interwoven with gold.

SONOMA COUNTY.

QUICKSILVER.—Cloverdale Bee, Jan. 25: There are two very promising quicksilver mines in this county. They are known as the Cloverdale and the Mount Vernon Quicksilver Mines; are situated 12 miles from this town, and extend from Squaw Creek in an easterly direction, toward the Geysers. A tunnel is being run on the Mount Vernon. On the Cloverdale there is an open cut 30 ft. wide, and about the same extent is excavated in. It is estimated that there is about \$10,000 worth of ore on the dump of the Cloverdale.

TRINITY COUNTY.

NGUET.—Trinity Journal, Jan. 25: Last Saturday a fortunate miner found a nugget of gold on Buckeye mountain, which weighed 3½ lbs. avoirdupois. Buckeye Mountain, so called, is a dry gravel ridge, lying between Rush Creek and Stuart Fork, and below the line of the projected Stuart Fork Ditch. Several large pieces have been found on Buckeye before, one weighing nearly 10 lbs.

THE WAY TO MINE.—We are informed that last week Mr. Jos. McGillivray stripped 6,000 ft. of bed-rock in his mining claim. This was done with a small-sized patent nozzle. We believe it is his intention to use a much larger sized nozzle hereafter, and he expects thereby to strip twice the bed-rock in the same time.

TUOLUMNE COUNTY.

KINCAD TUNNEL.—Sonoma Independent, Jan. 25: This experimental enterprise, draining the deep sinks of the placer mines in the boulder deep of the country, struck through to their shaft on the 17th inst., after tunneling 5 years, 1 month and 3 weeks, without intermission—working 3 shifts night and day.

A Co. of energetic capitalists who styled themselves the Kincad Flat Mining Co., conceived the idea that to drain the Flat by tunneling would be a paying enterprise, and forthwith set about it. From the commencement until the completion of the work, they have blasted in hard lime, flint and slate rock, and no timber was needed. This makes a splendid safe tunnel—being 5 ft. in the bottom, 6 or 7, and 8 ft. in the widest places. The lineal length of the tunnel is 1,762 ft., and the depth of the shaft driven for and reached is 82 ft. There is 50 ft. of gravel and clay on one side of the shaft, but this is not by any means the deepest gravel, as they have found it to the depth of the shaft itself, and no bottom to the gravel has as yet been found.

YUBA COUNTY.

PITTSBURG.—Cor. Marysville Appeal from Sucker Flat, Jan. 29: This mine formerly paid extremely rich and has much valuable ground left. It lies in a narrow, low part of the channel, a large part of which was worked out by the first tunnel. It is now lying idle, and has been for some time. A new tunnel, much lower than the first, has been nearly completed, but that is also idle now.

BLUE GRAVEL.—This claim is quite large, the former owners believing it contained untold wealth, and time has proved their theories correct. They commenced their first tunnel in 1855, finishing on Christmas, 1862. It was 1,200 ft. long, and it was supposed that it would drain the channel of the claim, which was 1,000 ft. front. In this they were mistaken,

as evidenced by their running a lower and deeper tunnel some years later. The Co. became very poor before completing their work. Pierce now a millionaire, kept the boarding-house; McGanney, now rich, wheeled his barrow, and delved with the laborers in the tunnel. At last the tunnel was finished, and a washing or "run" obtained, realizing \$60,000, and the value of this claim was assured. Since then the Co. has divided \$1,570,000, and a portion of this claim was offered for \$40 a share but a few weeks previous. There can be no reasonable doubt but the gross earnings of the claim will amount to \$25,000,000 or \$30,000,000. The work will last for 3 years longer, leaving its owners all millionaires.

BLICK POINT.—This Co. started their tunnel in 1867; it is 2,270 ft. long, 7 ft. wide and 8 ft. high, with a forty-two inch flume, costing \$166,000. This claim has 1,000 ft. front, runs back 500 ft., lying square on the channel; has paid in dividends of \$200,000, and will last much longer, at least 2 years.

Nevada.

ELY DISTRICT.

SILVER PEAK.—Pioche Record, January 18: The ore in this mine is now down 170 ft. The indications are flattering. A stratum of very rich ore has been reached at the bottom of the incline. A rich pocket may have been struck. The dip of the ledge is now about 70 degrees.

PIOCHE.—We were shown the resulting bar of a test working of 14 tons of ore from this mine by the test process. The following is the result: Silver, 887.90 ozs.; total value, \$1,044.61, of which \$27.53 is returned as gold. Another bar produced during the test is worth \$1,214.61. First-class ore continues to be brought to the surface at the rate of 5 tons per day, on which the Magnet mill is constantly crushing. Six assays, embracing all the different classes of Pioche mine ores, are given as follows: 1st, \$675.44; 2d, \$2,104.29; 3d, \$1,626.42; 4th, \$1,600.14; 5th, \$2,199.5th, (car samples) 172.00.

HUNN & HUNN.—The new hoisting works will be in operation the present week, they are of first-class character, and the mine is fully and efficiently opened, with good bodies of ore exposed.

MAZEPPA.—Drifting on the 160-ft. level continues, with ore its entire length. About 30 tons of fine ore have been raised during the past week. This mine is very promising. It is estimated that the ore on the dump will work \$200 per ton if not more. It is a rich chloride in character, and yields assays as high as \$3,000 to the ton.

MEADOW VALLEY.—The shipments of ore to the mill are again made with former regularity. The ores are unchanged in quality and extent.

GRAND TUNNEL.—A shaft is now down 120 ft. below the level of the tunnel, and a drift has been run from the shaft on the vein 180 ft. The ledge proper has an average width of about 3 ft.; 113 tons of ore from this mine, worked last month, returned something over \$200 to the ton.

PROCK PRINCE.—Fine ore is being hoisted, and the mine is very promising. The new shaft is now down 130 ft., and a contract has been made to sink 300 ft. deeper. Contractors are making 3 ft. every 24 hours.

CHIEF OF THE HILL.—This mine continues to give the best of evidence of its value in its steadily increasing bullion shipments. The amount produced and shipped during the week was unusually large. The ore breasts are unchanged.

MAKIN.—Drifting the main shaft, which is now down 230 ft. The ledge is well defined from top to bottom, and is fully 3 ft. wide. The indications are very flattering.

CHIEF EAST EXTENSION.—The main shaft is being sunk below the 90-ft. level. The ledge is well defined. Ledge matter from 2 to 3 ft. wide, with some good ore through it.

NEWARK.—Commenced shipping ore to the Flag mill for reduction last Friday.

KINSTON.—The main shaft is now down and substantially timbered 25 ft. Drifting for the ledge night and day. The drift is only in about 25 ft. at this writing.

ORIENT.—The shaft is now over 100 ft. deep. Very little change in the character of the rock.

ISOMA.—Drifting for the ledge is continued with all energy, 3 shifts being engaged.

BULLION.—W. F. & Co. shipped \$90,887.52 in bullion during the week, against \$84,674.93 last week.

WASHOE.

SUTTERLY.—Gold Hill News, Jan. 22: We were shown last evening a certificate of an assay of float rock from the newly discovered quartz deposits east of Virginia. The largest assay shows \$9,373.22 per ton, nearly all gold in fact, there is not much more than a trace of silver in the ore. It is said that on the claim there is not less than 2,000 tons of float in sight. We were also shown two assays from an extension of the Sutterly. One showed \$197.15 and the other \$78.35 per ton. On this claim they have a lead, but on the Sutterly the lead has not yet been found; in fact, they have not looked for it, as they say they have plenty of ore on the surface.

GOLDEN EAGLE MINING CO.—This Co. own the location spoken of in our issue a day or two since, in the foothills 14 miles east of Virginia. At the meeting a number of specimens of rich ore from the mine were exhibited, along with some 15 or 20 assays from different offices in Gold Hill and Virginia, ranging in value from \$20 to \$300 per ton.

BELOHER.—Jan. 25: Daily yield 300 tons from the 1000 and 1100-ft. levels, added by quite a contribution from the 1200 during this week, hoisting through the winze 200 ft. south of the Crown Point line. The 1200-ft. level is opening out as finely as could well be wished. The ore body is found to extend further south than in the level above, a very encouraging circumstance for the Seg. Belcher, and the ore generally at that level averages fully as good as in any of the levels above. The main incline is down 45 ft. below the 1200-ft. level, the bottom being in hard blasting rock, perfectly dry. The drift east at the 1000-ft. level is in 318 ft. and has about 50 ft. farther to go to reach the ore streak. The drift north at the 850-ft. level is in 432 ft.

OLIVER.—The new cross-cut from the main north drift on the 400-ft. level of the new shaft is in 30 ft., passing almost the entire distance through low grade ore. Mixed with the low grade ore is occasional spots and streaks of rich ore, but taken as a body it is doubtful whether the ore will pay for crushing. The main drift south on this level has cut a fine body of almost barren quartz.

CHOLLAR-PORT.—Daily yield 115 tons, the assay value of which is \$32 per ton. The ore breasts in the different portions of the mine are looking and yielding well as usual. The prospecting drifts at the 750-ft. level and the north drift from the 950-ft. station are driven steadily ahead.

CROWN POINT.—Daily yield about 400 tons. The mine is looking well at all points, but especially at the 1300-ft. level, which is turning out better than any of the levels above. The ore is being extensively and systematically breasted out to the extent of 200 ft. or more along the main drift. At the south end it is worked to within about 10 ft. of the Belcher line. The ore is of extra richness at that point and the body large. The cross-cut east, through the ore body is in 128 ft. with the face in low grade ore and porphyry, and no sign of any east wall. The main incline is down to the 1400-ft. level, with little or no trouble from water and the station for the new lower level will soon be opened.

GOULD & CURRY.—The incline is down 130 ft. below the 1500-ft. level, making excellent progress, though

the rock continues hard blasting. Last Monday a heavy body of water was tapped by the main east drift on the 1500-ft. level, driving the men from the drift and stopping all work in that part of the mine for the present. The main south drift on the 1600-ft. level, to connect with the north drift from the Savage, is being pushed with all the vigor possible.

HALK & NONCHOS.—Daily yield 150 tons of good milling ore. The ore breasts on the different levels of the mine are looking and yielding well. The construction of the ore and waste shafts at the mouth of the main ore body, on the 1700-ft. level, is about completed. A drift north has been commenced on this level to connect with the north winze from the 1,500-ft. level. Sinking the north ore engine winze from the 1,500 to the 1,700-ft. levels is making excellent progress.

KENTUCK.—The old workings between the 400 and 600-ft. levels still continue to yield considerable good ore, and Superintendent McDonald thinks he can extract 40 or 45 tons a day for several months yet. Prospecting will be resumed at the 1,300-ft. level soon.

SAVAGE.—Sinking the incline is making excellent progress, the ground working well. The main drift south on the 1,600-ft. level is pushed steadily and vigorously ahead. The main north drift on the 1,600-ft. level, to connect with the south drift from the Gould & Curry, is making excellent progress, the ground working well, with a considerable increase of water in the face.

VIRGINIA CON.—The shaft is down 148 ft. below the 500-ft. level in good working ground, the sinking making excellent progress. The main north drift on the 1,107-ft. level, from the Gould and Curry shaft, is making good headway, the rock in the face working well. **ARIZONA AND UTAH.**—Drifting east at the 1,500-ft. level from the incline progressing as last week, in hard dry blasting rock. The drift east at the 1,400-ft. level is still running in favorable ledge matter with no sign of the east wall. The water tapped by this drift is nearly all drained out leaving almost none to contend with. Drifting and cross-cutting at the 1,300-ft. level, north going forward as usual.

ARIZONA AND UTAH.—No work has been done in the shaft during the week, on account of the body of water tapped last week. The drift from the 210-ft. level to connect with the Globe tunnel is being pushed with all the vigor possible. The drift from the Globe tunnel to connect with the one from the shaft is also making excellent progress.

ARIZONA.—This claim is situated in Silver City District, a little to the northeast of the Suncor, and some distance to the east of the Comstock ledge. It was worked from 1860 to 1864, the ore being mostly crushed in the Eureka mill, and paying from \$20 to \$60 to the ton. In 1864 the work was stopped on account of the great body of water tapped, which nearly filled the mine. A tunnel has been commenced lower down the hill, which will cut the ledge 100 ft. below the old works. This tunnel is now in about 60 ft., and will have about 100 ft. more to run.

BALTIMORE CON.—The main west drift is thoroughly retimbered and in good working condition to the face, which is about 10 ft. into the clay wall, cutting occasionally bunches and strings of quartz, with strong indications of a near approach to the main ledge.

BEAVER.—Daily yield for the week 54 tons of good milling ore, showing an increase in the yield of about 24 tons per day. The ore breasts on the different levels never were looking and yielding better than at present. The Sherman and Hope mills are kept steadily running on ore from the mine.

INSURANCE.—The incline is down 115 ft. below the tunnel level, and the sinking is stopped for the present on account of the steady increase of water in the shaft. A cross-cut west has been started at this point to reach the west wall.

JULIA.—Opening a new station at the 1000-ft. level is making rapid progress. The main east drift on the 800-ft. level is still driven ahead with better indications of a permanent ore body.

MAKIN.—The ore from the bottom of the shaft continues to exhibit the same extraordinary richness, but appears to carry a much greater proportion of silver than it did near the surface.

PICTURE.—Excellent progress made in sinking the incline. Formation and indications much improved. The lower tunnel is about being reopened and carried through to the ledge, which it will cut at a depth of 500 ft. from the surface.

SILVER NEVADA.—Daily yield, 55 tons of good milling ore, except the mill steadily running. The ore breasts in the upper and middle portions of the mine are looking and yielding well as usual.

SILVER HILL.—Sinking the shaft is making good progress, the bottom still in streaks of quartz and ore mixed with porphyry. The timber for the new station on the 255 ft. level are in, and the station nearly ready to commence the work of drifting. The main drift north at the first station during the week developed some fine ore, giving strong indications of a near approach to the rich chimney found on the level above in the old works. The ore in the face of the main south drift at the first station shows a decided improvement.

SUCCESS.—The new shaft at the foot of the hill, near the mill is down 90 ft., and a drift started eastward to reach the body of ore known to exist below the old workings of the incline on the hill. The new shaft on the east side of the hill is down 250 ft.

SURRO TUNNEL.—In about 3,520 ft. Good progress made in both tunnel and shafts.

WOONVILLE.—Incline down to the second level, which is opened, the drift being in 11 ft. and just about cutting the ledge.

Utah.

TINTIC DISTRICT.

COR. Salt Lake Tribune, Jan. 20: Mammoth Copperopolis is continually shipping large quantities of ore to Europe, the excellent quality of the ore from the mine being opened, the ore from which assays encouragingly.

TINTIC MILL and Mining Company is raising good milling ore from their Diamond ledge.

LUCKY.—A rich vein of ore has again been struck in this mine.

UTAH WINNER.—Salt Lake Mining Journal, Jan. 24: Among the promising mines in Little Cottonwood is the group composed of the Savage, Montezuma, Haverth, and East Chance, and owned by the Utah Winner Silver Mining Co. A large amount of work has been placed upon their mines and their development is rapidly approaching a point where large quantities of rich ore can be taken out daily by a few men at a small cost. A tunnel is being pushed low down the hill which will strike and connect all the veins in all four of the mines, and by which a vast amount of ore can be taken out with the greatest ease. Heavy strikes of rich ore have been made, and everything looks brilliant.

LION HILL GROUP.—Salt Lake Tribune, Jan. 25: ZELLA. Work upon this mine goes steadily on. The new shaft connection with the Senate Chamber will soon be ready for use, also the drift connection with the Silver Chief shaft, will soon be finished.

MOUNTAIN.—In the new shaft being sunk upon this mine, some very fine ore has been reached, but so far not in very large quantities.

CHLORIDE GROUP.—None of the mines of this group are at work, except the San Joaquin. From this some fine ore is being taken, but none being sent away for reduction.

SILVER SHIELD and McCOLLUM GROUPS.—No ore is being taken from any of the mines of these two groups and no prospecting is going on except in the Miners' Delight of the Silver Shield group and the Grey Rock of the McCollum group.

CHICAGO.—About 8 men are employed upon the works of this mine. The ore is extracted and piled away in the ore house, ready for shipment on the opening of spring.

Chemistry in Great Fires.*

The rapidity with which the great conflagration in Boston destroyed millions of dollars' worth of property, and set at defiance the most energetic efforts, combined with the most powerful mechanical appliances, invite an inquiry into the *modus operandi* of heat in such circumstances. An estimate of the heat evolved would probably show how weak is man, with all his combinations before such force. We might as well propose to extinguish Vesuvius, or arrest the outburst of an eruption of Mauna Loa. The phenomena show that greater heat force was engaged than is commonly involved in the simple combustion of ordinary fuel—or, in other words, the ordinary flame-heat of burning lumber would not have destroyed the materials presented to it in the Boston fire with such astonishing rapidity.

New Sources of Heat

Extraordinarily accumulated in the area of that conflagration must have been created. It may appear, also, that the very elements employed to extinguish the fire, under the peculiar circumstances of the case, were turned to the side of the enemy against those accustomed to confide in its usually all-sufficient efficacy. We venture to propose these things, because if found true, their appreciation must lead to new expedients in the future to suppress conflagrations.

First, by way of illustration: If by some Titan power the Falls of Niagara should be precipitated into the crater of Mauna Loa in a state of eruption, what would become of the water? Would it put the fire out? No. Would it not become an additional combustion to immensely increase the light and heat? In such an enormous cauldron of fire, or plutonic furnace, the water, before it could act as water to extinguish the fire, would be converted into steam or vapor and ascend. In ordinary fires we see this in the white vapor which arises as soon as the water is poured on the flames, and when only a part of the water projected arrives upon the burning materials. Fortunately, this fraction of the water, the other part being lost, usually suffices. But it is probable that in our volcano the whole of the water would be lost, and Niagara would become an auxiliary of no mean potency to the internal caloric below. To this end, however, something more is required than the mere conversion of the water into ascending steam, driven out and pursued by the flames. Even as superheated steam it would be expelled all the faster. Its sudden expansion in our crater might damage its walls, and burst the chimney, but that would only extend the area of the fireplace below—not extinguishing the combustion.

The Fuel of Volcanoes

Consists of hydro-carbons, sulphur and water or hydrogen, carbon sulphur and oxygen. An accelerator to the combustion is the hydrogen of the water, liberated from its oxygen and the reunion of it and the free oxygen with the other existing hydrogen and carbon elements. Among these the sulphur in absorbing a portion of hydrogen, may act as an extinguisher. Some volcanoes, which emit usually fire, also at times eject only water, gas and mud. When hydro-carbons in combustion, meet these currents of water, the heat decomposes the steam into its component gases, and then follows greatly-augmented temperature and expansive explosions, and the heat generated is raised in the proportions of an ordinary flame to that of a compound oxygen-hydrogen blow-pipe. The recombination of these gases, viz.: the nascent oxygen and hydrogen of the decomposed steam, with the hydro-carbons furnished from the burning materials, give rise to the instantaneous

Formation of New Combustible Gases,

Whose heat of combustion or caloric power is of a far higher degree than that of the former simple elements. The additional heat-power of carbon oxide gas and carburetted hydrogen are added to increase the temperature and urge the flames. These producers of intense light and heat are attributable to and derived from the water.

Secondly—If now we have our volcanic illustration, and apply these views to the Boston fire, we may discover a similar state of things. The conditions of the Boston fire were extraordinary, and so peculiar to that conflagration that it may never or should never occur again.

The Boston Fire

Is a near illustration of a great volcano, though only as a feud artifice resembles those vast natural combustions in Nature's chemical laboratory. In a comparatively narrow area, ventilated by small and winding streets, were closely accumulated lofty walls of rock, intersected everywhere with large caverns, piled above each other four or five stories high. These spaces among the walls were well stored and packed with hydro-carbons in their most concentrated forms, even as the cavities in Blossom Rock were crammed with barrels of gunpowder. In the Boston volcano on the intersecting partitions of the magazine were also hydro-carbons in wood form. The contents were chiefly cotton, silk, and wool, or the dry goods which filled the stores. All these are concentrated hydro-carbons. Besides these were accumulations of oils, spirits and other vegetable and animal hydrocarbons. We leave to others to calculate the expansive force of a

bale of these goods tightly packed, when by the sudden addition of great heat, it is promptly converted into burning gas, and to multiply the sum of that calculation by the number of bales, when the fire was once fairly started and they became involved in a heat of from 3,000 to 4,000 degrees Fahrenheit, they could not wait upon the slow combustion of ordinary flame, but were promptly converted into incandescent heat, and transformed into their expanded gaseous elements, which as promptly united with the gaseous elements of steam. We have now their combined power bursting, splitting, and calcining walls; consuming and incinerating lumber, far faster than ordinary flame-heat—melting and vaporizing metals in an instant—and even as quickly recombining the carbon smoke into carburetted hydrogen, and forcing that same smoke to return to destructive force. From the atmospheric air drawn through the streets and stories the oxygen would be quickly abstracted; while the nitrogen and carbonic acid gas of the air, though really extinguishers, when superheated to two or three thousand degrees, become incendiary agents to communicate fire and consume what they touch. We know of no other explanation to offer for the astonishing rapidity with which the Boston fire accomplished its work of destruction.

Precaution Proposed.

Immediately after this great fire the architects of San Francisco with commendable zeal assembled to inquire why the fire-proof buildings so suddenly wilted, and to devise new methods for the future. If the above views are correct they will perceive how vain is their assiduity. As a first remedy, broad streets and low buildings might be suggested. The storage of the bulk of goods in special warehouses, and their sale by samples from smaller stores; but this question may fairly be left to architects, and to merchants who pay \$5,000 per front foot for land. The suggestions of a chemical nature may possibly serve the municipal authorities and the fire and water departments.

Though fresh water under, the above conditions, supplies the combustible fuels, we find in salt water a counteracting agent. If salt water contains oxygen and hydrogen, it also yields from its murate of soda a large amount of chlorine. This chlorine nascent at the moment of the decomposition of the steam, would enter the most positive extinguisher by intercepting as a formation of combustible gases. To salt water, then, reference may be had for important aid.

If great fires were more frequent, and the subject "would pay," a chlorine company might be formed in conjunction with the Fire Department, conducting its chlorine into every building, and by chlorination extinguish fires, and otherwise enliven unhealthy places.

*Read before the California Academy of sciences by Dr. A. B. Stout.

A New Magnetic Toy.

A novel and peculiar magnetic toy or game, which Roman & Co. have for sale, is something that would rather surprise the casual observer with its seeming intelligence in answering questions propounded to it. It may be used for amusement or instruction and is intended more particularly for children or scholars who are studying elementary school books, and serves as an aid or teacher. There is a flat box divided by a glass partition and under the glass is a small magnetic needle arranged to move freely, and to it is attached a non-magnetic finger or indicator. The glass is covered with paper, with the exception of a portion which shows the extremity of the needle. A circular card is placed around the outer edge of the box on the glass on which are printed or written answers to questions; a small circular card is placed in the center upon which are printed or written questions to correspond with the answers on the outer card. The small card is made of two thicknesses of paper between which is a small magnet.

The loadstone suspended magnet being positively electrified, will then cause the finger or indicator to follow the negatively electrified end of the magnetized piece of steel in the small card containing the questions. The arrangement of the answers around the exposed portion of the glass is such that when the subdivision in which the question occurs on the central card, is placed to correspond with the mark at the north point of the negative end of the magnetized steel, will cause the finger to point to the answer on the outer row. By using a number of questions and answer cards, the device can be made use of quite extensively as an instructor for children and will also afford amusement and instruction for older persons. This toy, which was recently patented through our agency, by Jacob Unna, is called the "Chromagica," and, as furnished by Roman & Co., is very neatly prepared. The questions are in the main sensible ones, and parents or teachers using it could, of course, prepare cards for themselves to suit the age of the children. It is one of those toys seldom met with, which is amusing, and at the same time instructive.

CLEAN UP.—The last clean up of the Virtue mill, Oregon, was \$12,600 or \$240 per day. The mill has ten stamps and the mine belongs to the Virtue Mining Company.

The First Quartz Mill in California.

In our issue of January 4th we gave two wood cuts representing the mill and stamps of the Keystone Mill, in Amador county. In the article accompanying the cuts we said that there was considerable difference of opinion with regard to the locality of the first quartz mill ever built in California, but we were assured that the one represented in the illustrations, was really the first mill built here. We gave no dates, as we were unable to get them from reliable sources, and preferred to leave the question open for some of our interior contemporaries to answer. As several localities claimed the honor, we wished to obtain the dates, etc., for the benefit of readers of the Press. Our excellent and well managed exchange, the *Mariposa Gazette*, proposes to put in a claim for Mariposa county, and gives facts and dates which it thinks will establish the priority of that county, in the matter of quartz mills as well as quartz mines. It says:

The first quartz mill, including a small steam engine and machinery, was brought to Mariposa in 1849, for Col. Fremont, by James Duff, who is now a resident of this town. He started with it, from the East, in April of that year. The mill was put up on Mariposa creek, near the lower end of the present town, in the month of August, 1849, and was operated by Palmer, Cook & Co. for Fremont, and was known as the Palmer, Cook & Co. mill.

In June, 1850, the machinery for another mill was brought here for Commodore Stockton, and put up on Stockton creek, about a mile from the town of Mariposa. J. R. Norris, an old Mariposian, now a resident of the Salinas valley, was the agent and business manager for Stockton, and John Barnett, who died here last spring, was Superintendent of the mine.

The third quartz mill erected in Mariposa was brought out by Capt. Howard, of the U. S. Navy, early in 1850. It was located below the present site of the town, near the spot now occupied by the Mariposa Company's mill. It was known as the Fremont mill.

J. F. Johnson (known familiarly as "quartz Johnson"), put up two quartz mills during the year 1850—one, a horse-power mill, at Bear valley, and the other, a steam power, at what was known as Ridley's Ferry, on, or near the site of the Beuton mills.

The first regularly organized and incorporated quartz mining company in the State of California was the Merced Mining Company. Among its stockholders were Smythe Clarke, Moffat (the assayer), T. Butler King, J. F. Johnson, and Dr. Temple of St. Louis.

We have given our dates, and if any county in the State can prove up an earlier experience in quartz mining than Mariposa, we will be pleased to see their figures and publish the fact.

HANDSOME ALBUMS.—We saw recently, at the bindery of Messrs. Bartling & Kimball, corner of Sansome and Clay streets, some remarkably fine specimens of book bindery. The books were made for Watkins, the well-known photographer, and were intended to hold large views of Yosemite and other California photographs. The binding was in gilt and heavy morocco; in the center of each on the outside was a panel of California laurel, brightly polished, making a handsome and peculiar finish. The books are very large, admirably adapted for the purpose and prove that our California binders can do fine and substantial work, equal to any in older countries.

COAL VS. WOOD.—The Belcher and Yellow Jacket companies are now using coal at their hoisting works instead of wood; according to the *Virginia Chronicle*. This is as it should be, as the railroad find it impossible at present to furnish all the mills and hoisting works with wood.

SMELTING IN ARIZONA.—Baker's smelting furnaces, in Wallapai District, Arizona, after repeated failures are now reported to be working successfully, and are now turning out 40 tons a day. The trouble has been in getting proper fluxes for the ores.

TRANSIT OF VENUS.—A convention of the astronomers designated by France, Germany, England and Russia, to observe the Transit of Venus in 1874, will meet at Paris in February to determine the exact points of observations.

A NOVEL IDEA.—The motive power of the griet mill at Prairie City, Grant County, Oregon, is water from a hot spring, which prevents any fear of stoppage from a freeze-up in cold weather.

ELY DISTRICT MINES.—During the year which has just passed, 349 mining claims were located in Ely District; a large number for such a short space of time.

MINERAL HILL MINES.—The sum of \$590,448 was shipped from Mineral Hill by Wells Fargo & Co. during 1872.

The Floral Mill.

This is one of the most important enterprises in Ely District, says the *Pioche Record*, and is located in the lower part of Pioche, so that it may be reached by teams from all the mines without any heavy pulling, being a nice down grade all the way. The Floral is designed as a custom mill, the necessity for which has long been felt by the mining population here. Many men of limited means and possessing mines of great value, have been compelled to abandon them, not being able to have their rock crushed without incurring the expense of hauling a great distance, thus leaving them without sufficient remuneration for their labor. With the completion of the Floral mill, however, which is easy of access, an opportunity is afforded every one having a good claim to have his ore crushed on such terms as to make it profitable to the miner of moderate means, and thus benefit the whole camp by the crushing of a vast amount of rock which otherwise would not be crushed at all. As the mill is so near completion as to admit of a fair view of it, and all the machinery being on the ground, we yesterday visited it, and Mr. J. C. Clark, the superintendent, courteously showed us through the whole establishment, and explained the entire machinery, showing what had been done and what was contemplated. The main building is 42x60 feet in dimensions; the engine room 30x69. The machinery is all of the latest patent and highest finish, and was made at the Risdon Iron and Locomotive Works, San Francisco. (This is the first machinery in the camp from the Risdon Works.) The stone foundation is a master piece of workmanship, as firm and durable as mason work can be made, and destined to stand till the youngest child of this day is bowed down with declining years. The wood work is durable, also, being bound together with heavy iron rods and securely braced throughout, dispensing with the usual stanchions which are so much in the way of operatives in other mills. This mill has 20 stamps, with two boilers, 48x16 each; fly-wheel 14 feet in diameter; engine 90-horse power; and also Blake's adjustable cut-off and governor, designed to prevent accidents, for in the event of a belt breaking the engine stops without human aid. Attached to the mill is a retort room, dry kiln, chemical room, office, blacksmith shop and boarding house, and an assay office will soon be added. On the ground are 500 cords of wood and a water tank of 14,000 gallons capacity, and another tank to be built, so as to have no less than 30,000 at command all the time. The crushing capacity of the mill is 25 tons a day. Mr. Clark proposes attaching a heavy hose to the main pipe of Floral Spring Water Company, so that in case of fire the means of its extinguishment may always be at command. The work was commenced on the 2d of September last, and by the 15th or 20th of next month the ears of our people will be greeted by the shrill whistle of the Floral Mill. The whole cost of the mill is about \$60,000. It bids fair to be a profitable investment of capital, and will confer untold benefit upon the mining interest. The large scales of the company, with a capacity for weighing 40,000 pounds, will be erected near Boone & Dolman's hay yard, for the use of the company and such others as wish to avail themselves of its advantages.

Arizona Mines.

The *Arizona Miner*, in an article entitled "Mines and Mining," says: Under this head is concentrated the hopes and expectations of two-thirds of the population of the Territory and our review of the situation is not as satisfactory as could be wished. Indians and dry weather having prevented operations on some of the most promising mines.

The number of distinct, different quartz veins or lodes discovered and located in the Territory is carefully estimated at more than 2,000. On a large number of them sufficient work has been done to warrant the belief that they are fissure veins and will develop into valuable mines.

The greater portion have never been opened sufficiently to enable one to consider them anything more than promising surface indications. Many of the discoverers have been killed by Indians. Others have become discouraged and left the Territory, and hundreds of good looking veins which prospect well in silver and gold will, under the present U. S. law, requiring ten dollars worth of work on each 100 feet in length on each mineral vein, be forfeited and subject to re-location after the 12th day of May next.

There are fifteen quartz mills in Arizona, of from two to forty stamps, and the amount of silver and gold bullion turned out last year is estimated at about \$1,000,000.

There is more activity in quartz mining in Mohave county at present than in any other portion of the Territory, with better prospects of success than elsewhere, as the latter Indians are quiet and assist the miners by their labor, instead of retarding their operations by hostility.

Owing to the absence of water in the streams, but little has been realized from placer mines for three years past. A wet winter would add from \$300,000 to \$400,000, from this source, to our annual yield of precious metals.

USEFUL INFORMATION.

New Mode of Manufacturing Lamp-black.

A few years ago, a party of gentlemen started what they intended to be an oil well, near Cumberland, Md. They soon, however, were disappointed in their expectation, for instead of striking oil, they came upon a gas chamber. A short time afterwards, the emitting gas was accidentally set on fire, and continued to burn for a period of two years. About a year ago, according to the *Manufacturer and Builder*, Mr. Haworth, a gentleman from Boston, having heard of the burning well, went to Cumberland, tested the quality of the gas, and was satisfied that he could put into operation a scheme or plan of his own for the manufacture of carbon (lamp-black) from the gas. Accordingly, the well was leased or purchased, and a patent obtained for the manufacture, according to the plan of Mr. Haworth. A building was constructed, and the manufacture commenced about six months ago.

There are now in operation six hundred and sixty burners, each burner consuming eight cubic feet per hour. The gas is allowed to burn against soapstone plates, on which the carbon is deposited in the form of soot. By a very neat mechanical arrangement, the soot is scraped off and deposited in large tin boxes about three feet long, and a foot and a half wide, and a foot and a half deep; scrapers are passed along the soapstone plates every twenty minutes, and the boxes are filled on their fourth passage. A large building is now in course of construction, twice the size of the present one, and will have in use thirteen hundred and twenty-eight feet gas burners. The present composition of gas amounts to about one-twelfth of the whole quantity escaping from this well. When the new building is completed and the burners put in operation, the total consumption of gas, by this burners of both buildings, will be one-fourth of the whole.

The carbon is used for the manufacture of ink, and these works, we believe, are the only ones of the kind in the country; and as far as the knowledge of this owners extend, they are the only ones of the kind in the world.

As we have struck burning gas wells in this State, would it not be well for the owners thereof to consider the feasibility of utilizing them in the manner above described?

LAUGHING PLANT.—A singular vegetable phenomenon has been discovered during recent explorations in Arabia. It is called the laughing plant, from the effect which is produced by the seeds. When they are pulverized and then eaten in small quantities, the person eating them will soon begin to laugh loudly, then to sing, dance, and do all manner of absurd things. This lasts for about an hour, after which he goes to sleep, and having slept another hour wakes up utterly unconscious of what has occurred. It has been suggested that this plant might be made a substitute for alcohol, and that it would have the advantage of being cheaper. But it is scarcely probable that the Arabian plant could in fact be made popular in that capacity, for it does not appear that it inspires the person who partakes of it with a desire to whip his wife, murder his mother, or to indulge in any of the little pleasantries that the alcohol of the period moves one to perpetrate.

RAPIDITY OF MUSCULAR CONTRACTION.—A dragon-fly, balanced on its wings at the side of a car speeding its way over the rails, at the rate of forty miles an hour, appears to be almost motionless, but to keep up with the car, its wings must vibrate many thousand times a second. The eye cannot detect their up and down action, so exceedingly rapid are the contractions and relaxations of the muscles acting upon them. All at once they dart off at a right angle so quickly that the retina cannot have an impression remaining long enough to retrace their course. Therefore, those same muscles, too small to be seen but by powerful microscopic assistance, must be urged to still more rapid action. Such intense activity far exceeds the vibration of musical chords, and therefore exceedingly perplexes entomologists, because the nervous system of insects is so extremely minute. The question is: How much power is generated for keeping a dragon-fly's wings in uninterrupted motion for many hours in succession, without apparent fatigue?

POWER OF THE RIGHT HAND.—In a paper read before the Chirurgical Society of London, Dr. Ogle states it as his belief that the superiority of the right hand, in works requiring strength and skill, is not due merely to custom and usage. His reasons for this opinion are that the superior power of the right side is not confined to the arm, but extends to the leg, and that it commences in the arm before use or education begins, and continues in spite of all efforts to resist or divert it. This superiority has a resemblance to some malformation, inasmuch as it is hereditary and is met with more frequently in the male sex, not only in men, but in apes and parrots. The author further asserts that the left side of a right-handed man is greater than the right, and vice versa, and he suggests that this greater development of the left side is due to the greater quantity of blood which it receives.

Oiling the Harness.

In these times of poor leather, we should clean and oil the harness at least once a year, to keep it in good condition, and to reduce the wear and tear as much as possible. Don't let the job out to the harness maker, but some of these stormy days when this harness is not in use, just take it into the work-shop and commence operations. Take the harness all apart, and scrape off all scurf, hairs and dirt, and wash the leather clean with soap and hot water. Then heat two or three quarts of neatfoot oil in a long shallow pan, and draw each piece of leather through it slowly bending the leather backward and forward, and rubbing the oil in with a cloth or a sponge. Hang near the fire to dry, and repeat the process until the leather is saturated with oil; mix a little lampblack with clean tallow, and with a cloth rub it into the leather while warm, until the pores are filled and the surface becomes smooth and glossy. If a harness is oiled in this way it is never gummy, and will therefore keep clean a long time. Sometimes linseed oil or adulterated oils are used, but they dry on the leather and make it gummy, dirt and hairs stick to it and the harness gets so filthy as to soil every thing it touches. After the harness has had a good oiling, an occasional rubbing with tallow and lampblack will keep the leather tough and pliable, and prevent it from cracking.—*Country Gent.*

PAINTER ZINC.—A difficulty is often experienced in causing oil colors to adhere to sheet zinc. Boettger recommends the employment of a mordant, so to speak, of the following composition: one part of chloride of copper, one of nitrate of copper, and one of sal ammoniac are to be dissolved in sixty-four parts of water; to which solution is to be added one part of commercial hydrochloric acid. The sheets of zinc are to be brushed over with this liquid, which gives them a deep black color; in the course of from twelve to twenty-four hours they become dry, and to their now dirty gray surface a coat of any oil color will firmly adhere. Some sheets of zinc prepared in this way and afterwards painted have been found to entirely withstand all the atmospheric changes of winter and summer.

PERFUME FOR THE HANDKERCHIEF.—A delicious perfume for handkerchiefs, etc., can be made after the following recipe: Procure half a pound oforris powdered; pour over it one pint of rectified spirits; let them stand in a bottle tightly corked for one fortnight; then filter the spirits through blotting paper, and add half a drachm, otto of lavender, one drachm of otto of bergamot, and half an ounce of otto of neroli. Let it stand for twenty-four hours, and then filter through blotting paper to make it very clear. A paper filter is easily made by taking a square piece of blotting paper that will just lay over a pint or quart bowl, fold it twice and from corner to corner. Now open it, and you can pour the liquid in very easily, using a small pitcher to drain it into.

ANTIMONY AN EXPLOSIVE METAL.—If a piece of copper foil be attached to the negative pole of a galvanic battery, and a piece of platinum foil to the positive pole, and the two immersed in a hydrochloric acid solution of antimony, the antimony will be precipitated as a metallic mirror on the surface of the copper. After removing it from the liquid and carefully washing with distilled water, the brittle antimony can be removed by bending the copper back and forth. Antimony thus obtained will explode upon being rubbed in a mortar or struck with a hammer, light and heat as well as detonation being produced by this explosion. The reason of this extraordinary action of only one metal is due to the rapidity with which it returns from the amorphous form to the crystalline.

DOES FROST AFFECT THE STRENGTH OF IRON?—Notwithstanding the generally expressed opinion, and the apparent showing of careful experiments to the contrary of the above query, news of serious railroad accidents, from broken rails, has been pouring in from all parts of the country, since winter frosts became severe. Some of these accidents are appalling in extent and details, and it would seem that it was time, if such accidents do not proceed from the deteriorating action of frost, to consider some radical change in the structure of rails or track, that would effectually prevent this class of accidents.

REMEDIES FOR BOILER INCORUSTATION are almost innumerable. Among those in common use and lately recommended are soda ash, chloride of barium, carbonate of ammonia, chloride of ammonia, starch, potatoes, molasses, tannin or extract of oak bark, dye-wood extracts, bran, chicory, fate and tar. Mahogany saw-dust and clay are also used, but are objected to as producing injurious affects in the cylinder; and in regard to nearly all the substances above enumerated there is a difference of opinion among practical engineers.

BENZOLE AND BENZINE.—Pitch is readily dissolved by benzole, while it is scarcely at all dissolved by benzine. This, therefore, is the means of distinguishing the one from the other.

TO PREVENT RUST.—It is said that equal parts of carbolic acid and olive oil, smeared over the surface of the instruments, are an unfailing preventive of rust in any climate.

GOOD HEALTH.

Lifting--Its Rationale.

Prof. Welch, of Yale College, is a firm advocate of the benefits of lifting, from a strengthening point of view. He thus sums up its advantages, in the following language:

Lifting is a system of harmonious and simultaneous exercise of the whole body. Every muscle is brought into use at once, and each in proportion to its relative strength. And so connected are the vital organs with the muscular tissues of the body, that when all the muscles simultaneously and harmoniously act, the organs themselves receive their appropriate amount of exercise. So distributed in this effort that there is no danger of injurious strain or rupture. It strengthens the weak organs and expels disease, by a gradual co-operative exercise of the whole body. The strength of the whole is augmented and equalized, the weak parts are built up, disease is expelled, and the individual becomes uniformly strong, and, consequently, healthy. It develops power chiefly at the vital centers. All the voluntary and respiratory muscles are brought into harmonious play, expanding the chest, augmenting the breathing capacity, aerating the blood, equalizing the circulation, warming the extremities, and thus vitalizing every part; and by determining action and circulation to the whole surface, increases the relative amount of blood in the extreme capillary vessels, thereby removing internal congestion wherever located, and accelerating the nutrition of every organ. When these reasons are fully understood, the fact that many persons have, by the simple process of lifting, more than doubled their strength in three months, will not be surprising.

Something About Teeth.

Why, asks *Chambers' Journal*, do some people's teeth come out more readily than others? The reasons for this are probably many. About the middle of last century Peter Kalm, a Swede, visited America, and wrote sensibly about what he saw. He observed a frequent loss of teeth among settlers from Europe, especially women. After discussing and rejecting many modes of explanation, he attributed it to hot tea and other hot beverages; and came to a general conclusion that "hot feeders lose their teeth more rapidly than cold feeders." Mr. Catlin, who some years ago had an interesting exhibition of Indian society, dresses, weapons, etc., noticed that North American Indians have better teeth than the whites. He accounts for the difference in this strange way—that the reds keep the mouth shut, whereas the whites keep it open. The teeth, he says, require moisture to keep their surface in good working order; when the mouth is open, the mucous membrane has a tendency to dry up, the teeth lose their needed supply of moisture, and thence come discoloration, toothache, ticdouloureux, decay, looseness, and eventual loss of teeth. Mr. Catlin scolds the human race generally for being less sensible than the brutes in this respect, and the white race especially in comparison with the red. We keep our mouths open far too much; the Indian warrior sleep, hunts and smiles with his mouth shut, and respires through the nostrils. Among the virtues attributed by him to closed lips, one is excellent—when you are angry, keep your mouth shut.

Health Laconics.

SUNSHINE.—Do not exclude the sunshine to save the carpet. Sunlight is essential to health. Human beings are as dependent upon light as are plants and animals. Children reared in shady rooms have weak eyes, and are as frail and scrofulous as potato vines in a cellar.

COLD FEET.—Never go to bed with cold feet without applying a hot brick, hot bag of sand, a jug of hot water, or some warming material. Cold feet are often caused by tight shoes, stockings, or garters. When the feet are habitually cold, a smart walk or run before retiring, will often make them comfortable for the night.

DYSPEPSIA.—A majority of cases are owing to errors in diet and sedentary habits. Exercise half an hour each morning before breakfast. Eat plentifully of fruit and Graham bread. Avoid greasy dishes, fresh fermented bread, cold cheese, pickles and candies.

PALPITATION.—This is caused by thick blood, or obstruction in the excretory organs. Bathe once a week at least, and keep the bowels free.

IMPURITY OF THE BLOOD.—Never think of making the blood better by putting drugs or poisons into it. Pure water, pure air and pure food are nature's purifiers. Take of these first what the system can use and no more, and your blood will take care of itself—and of you too.

CORNS AND BUNIONS.—Have your boots and shoes made to fit your feet, instead of trying to shape your feet to the hoots and shoes. Then soak the excrescences in warm water occasionally, cut off the softened surface, and in due time they will be seen no more forever.

SLEEP.—Go to bed with warm feet, an empty stomach and unexcited brain. Be sure and keep a clear conscience. Then shall your sleep be dreamless and your days long in the land.

Foolish Habits.

Dr. Hall, in his *Journal of Health*, enumerates several practices of the careless public, which are sometimes as dangerous as they are foolish:

Walking along the streets with the point of an umbrella sticking out behind, under the arm or over the shoulder. By suddenly stopping to speak to a friend, or other cause, a person walking in the rear had his brain penetrated through the eye, in one of our streets, and died in a few days.

To carry a long pencil in vest or outside coat-pocket. Not long since, a clerk in New York fell, and the long cedar pencil so pierced an important artery that it had to be cut down from the top of the shoulder to prevent his bleeding to death, with a three month's illness.

To take exercise, or walk for the health, when every step is a drag, and instinct urges repose.

To guzzle down a glass of cold water, on getting up in the morning, without any feeling of thirst, under the impression of the health-giving nature of its washing-out qualities.

To sit down to a table and "force" yourself to eat, when there is not only no appetite, but a decided aversion to food.

To take a glass of soda, or toddy, or sangaree, or mint-drops, on a summer day, under the belief that it is safer and better than a glass of cold water.

To persuade yourself that you are destroying one unpleasant odor by introducing a stronger one; that is, trying to sweeten your unwashed garments and person by enveloping yourself in the fumes of musk, eau de cologne, or rose-water; the best perfums being a clean skin and well-washed clothing.

How Drinking Causes Apoplexy.

It is the essential nature of all wines and spirits to send an increased amount of blood to the brain. The first effect of taking a glass of wine or stronger form of alcohol, is to send the blood there faster than common, hence the circulation that gives the red face. It increases the activity of the brain, and it works faster, and so does the tongue. But as the blood goes to the brain faster than common, it returns faster, and no special harm results. But suppose a man keeps on drinking, the blood is sent to the brain so fast, in such large quantities, that in order to make room for it the arteries have to enlarge themselves; they increase in size, and in doing so they press against the more yielding flaccid veins which carry the blood out of the brain and thus diminish their size, their pores, the result being that the blood is not only carried to the arteries of the brain faster than is natural or healthful, but it is prevented from leaving it as fast as usual; hence, a don't set of causes of death are in operation. Hence, a man may drink enough of brandy or other spirits in a few hours, or even minutes, to bring on a fatal attack of apoplexy. This is literally being dead drunk.—*Dr. Hall.*

HOW TO GET RID OF MOLES.—Ladies have a horror of those black eminences which sometimes appear on the face, called moles. Even homely men dislike them, but there they ordinarily remain as guides in giving a description of an applicant for a passport.

An exchange says a mole is a thickening of the epidermis, or outer skin, probably induced by an obstruction in the outward ends of a cluster of sweat-tubes. To be clear of them readily, run a fine needle through one of them from one side to the other.

Let an assistant take hold of both ends of the needle and pull so as to make a neck of clear skin at the base. It is neither painful nor difficult, and attended with hardly a tinge of blood. Next ligate that neck behind this out-dragged mole with a delicate, strong, waxed silk thread, that cuts off the circulation; clip away the unused thread and await the result. A slight local inflammation ensues, which is the glueing together the new surface of the stitched skin.

In a few days this old offence drops off, deprived of nutrition, leaving no scar. If a little reddish by the remains of a subduing inflammation, wash the spot occasionally with cold water. Proceed to the next, and the next, seriatim. Before aware of it, any mole-disfigured face may become as good as new.

WHAT IS UNDER THE HOUSE?—One great fault in building houses in both city and country is to make them too low on the ground. There should be distance enough to allow a free circulation of air, say three feet, between the floor and the earth. All rubbish, shavings, etc., should be cleaned away before siding up, and a good ventilation should be kept open to insure dry, sweet air under the floors. Much sickness is caused to many families from low underpinning, and close, damp, stagnant air, carrying miasma into the lower rooms through the floors of dwellings. Many houses are built upon flat ground, and the earth thrown around the outside, making a sink under the house to hold water. This is wrong. It is much better to raise the ground under the house, and even gravel and cement before building. At any rate, ventilation under the house should be always attended to. We do not believe in cellars under the house in this climate, but whenever there is a cellar it should be open, and always kept clean of decaying substances. Guard against the enemies to health that lurk under a house.—*Ex.*



B. EWER..... SENIOR EDITOR.

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San Francisco:

Saturday Morning, Feb. 1, 1873.

Legal Tender Rate.—S. F., Thurs., Jan 30.—buying 93½; selling 93½.

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REDUCTION IN TELEGRAPH RATES.—It has been announced that after the 1st of February, all rates between the different offices of the Western Union Telegraph Company, for ten words that are now more than \$2.50 will be reduced to that price. This is particularly beneficial to parties in this State, as it reduces telegraphing expenses to the East materially. Cheap telegraphy is one of the necessities of the age, and the people care very little who furnishes it as long as they have the benefit.

AN ANCIENT FROG.—While the workmen were engaged in sinking a vertical shaft at the Black Diamond Coal Company's mine in Mount Diablo, recently, they came upon a frog at the depth of 172 feet. It was imbedded in solid sandstone, so that the impression of its form was perfect upon the rock around it, but nevertheless, was alive, and lived for twelve hours after its extraction. The President of the company now has it, and will present it to the Academy of Sciences.

HOME INDUSTRY.—The Mission and Pacific Woolen Mills have added another branch to their business, by undertaking the manufacture of rug and carpets. Their mills have attained such a reputation both at home and abroad by their superior products that there is no doubt but that the carpets will be as good if not better than those made in the East.

JAPANESE PROGRESS.—An industrial fair and exhibition is to be held in the city of Kioto, in Japan, in March, and a number of San Francisco manufacturers are about to forward articles to that place. In view of the increasing trade with the Orient our artisans and manufacturers should take advantage of every opportunity to show their wares, and get the business orders before Eastern agents are able to do so.

SILK CULTURE.—A lecture on "California's Future—Silk Culture and Manufacture," is announced to be given at Platt's Hall, on Friday evening, Feb. 14th, by Joseph Neumann, well known by his long connection with this important and growing California interest.

The Railroads of the Golden State.

Their Wonderful Growth.—Their Length in Miles.—The Regions Tapped by Them.—Their Future Development.

It has often been truly said, that there is nothing new under the sun; but to every rule there are exceptions, and moderns may boast exclusively of the four great instruments of civilization, the railroad, the steamship, the electric telegraph, and the printing press. The railroad in particular is the great civilization; it performs now the same service that the rough and hardy pioneer did a hundred years ago. It penetrates the deepest forests, reaches the remotest wilds, crosses the most tremendous mountain chains, and bridges the broadest, swiftest and deepest rivers. Population and wealth follow in its train, the forest recedes before it, the plain smiles with waving grain, towns and cities spring up as if by enchantment, States are founded. Population used to precede it, now it follows. From the mountainous character of the Pacific coast, much of it would have been doomed to remain in a state of nature for another half century but for the railroad. But now the progress being made in covering it, particularly California, with a network of railroads, is fast fitting it as a home for the poverty-stricken and landless millions of Europe and the East. And over our roads in the future, the current of the world's commerce will flow.

Growth of Our Railroad System

Though late, has been extremely rapid. It was six long years before the hardy forty-niners grew tired of mule teams, and began to think it was high time for them to be abreast of other communities in the matter of railroad communication, and fourteen before they seriously entered on the work of railroad building. Then, the excitement occasioned by the war of secession and by the fear that California might be invaded from Texas, or annexed by some country with which we might be at war, impressed on the nation the necessity of connecting San Francisco and New York, the East and the West, by the iron hand of a railroad. Finding that they were about being brought into connection with the great centers of American civilization and commerce, our people took the hint, and began the construction of the Sacramento and Folsom line, their first railroad, in 1855. This was finished in 1856, at a cost of \$1,100,000, and we had then 23 miles of railroad to boast of. A small beginning but one that was after some years followed vigorously and in a manner characteristic of California enterprise. The San Jose road, connecting with the beautiful city of the same name, was begun and finished in 1863, seven years after. And now may be said to have begun the period of railroad building in California. The project of building a grand trans-continental railroad had been mooted almost ever since the first rail was laid in the United States, but it was not till 1862, that a bill for its construction passed Congress. Immediately on the hills being passed, the builders of the road set to work with unwonted vigor. For the first three years 20 miles a year were built, in 1866, 30 miles, in 1867, 46 miles and so on till it was finished on the 10th of May, 1869, when the glad tidings were flashed over the wires, that the golden spike, that was to unite the East and West, was driven. From the time of the beginning of the work on the Central Pacific, railroad enterprises sprang up on every side. All the great towns of the State were anxious to be connected with the trans-continental line and already San Francisco was looking forward to the practicability of building another trans-continental line by the 34th or 35th parallels. The Western Pacific to connect San Francisco and San Jose with Sacramento, and this with the Central Pacific was chartered in 1862, but very little vigor was shown in its prosecution and it was not finished till September, 1869, a year and a half after it was begun, and four months after the completion of the Central Pacific. During the last three years, the following important railroads have been begun or have been pushed forward with vigor: The California and Oregon, the Northern Pacific, the Southern Pacific, and the San Joaquin Valley Railroad. The line from Los Angeles to San Pedro was finished in 1869. Our two greatest years of railroad building have been '69 and '70. During the former, we built 234 miles, and during the latter 223. In 1871 we only built 97 miles. In '63 we built 20 miles, in '64, 94 miles, in '65, 97 miles, in '66, 94 miles, in '67, 74 miles, and in '68, 86 miles. The

Existing Lines

Will make up when completed a grand total of 1,918½ miles in length. This shows that we are already acquiring the right to claim the reputation of being a railroad people. Yet, even a cursory examination of the map, will show how miserably inadequate our present system is, and what we have to do before we can afford to rest on our laurels, even for a short space of time. Three-fourths of California is as yet in a state of nature, not one-twentieth of the cultivable land is under cultivation, and as for our mines, we have hardly yet begun to know the extent of their riches. Hundreds of thousands of tons of ore that might be made to yield a profitable return, must be allowed to remain unutilized for want of cheap methods of transportation to the market. And the farmer will see his cattle and sheep driven from a market, or shut off by bare and inaccessible mountains from the outer world.

The Central Pacific.

Two hundred and seventy-six miles of which are in this State, is, whether considered in respect to the mighty energy employed in overcoming the obstacles both of nature and of lack of means, by its promoters, whether as a triumph of the highest exhibition of engineering skill afforded in our country, as evidenced by the rivers and chasms bridged, mountains tunneled and almost perpendicular ascents scaled, or whether regarded as one of the grand sections over which the commerce of the world must flow, is one of the greatest wonders of our age and time. Starting from Oakland it pursues its way through the center of the richest mining, agricultural and vine growing regions perhaps in the world. Leaving Oakland and passing by Brooklyn, Alameda, San Leandro and Decoto in a most beautiful and fertile country, it ascends the Mount Diablo range and passes through the bowels of the mountains in the tunnel of Livermore Pass, emerging on the other side in the hills that skirt the San Joaquin Valley. From Niles about half way between Oakland and this pass is the junction of the branch line that coming from San Jose girdles the bay.

Lathrop welcome to the junction of the great arterial line of the center of the San Joaquin Valley, and at Stockton to that of the Copperopolis road, destined

to skirt the whole of its western side. Crossing the 1,400 feet wide bridge over the Mokelumne, we arrive at the great inland railroad centre, Sacramento. Leaving this and crossing the comparatively level lands of the valley, and the pretty towns of Auburn and Colfax, the line enters the foothills of the Sierra Nevada, and soon climbs the mighty mountains themselves. Nothing for beauty, sublimity and terrific grandeur like the scenery from here to the borders of Nevada, is to be found in the world. The line climbs up and down hills and winds around them, spans terrific canons, and as in the case of Cape Horn, seems from the valley below to be almost suspended in the air from the summit of the mountains. A little beyond the great lumber depot of Truckee, it leaves the State, crosses the divide of the Trade of China, India, Australia and the islands of the East, the commerce of half a world. The cost of building it was \$91,378 per mile. In 1871 nearly half a million tons of freight passed over it and its income was nearly \$10,000,000.

The California Pacific Railroad

Will be, whether we consider the want of it, in conjunction with its branches, to supply a large extent of country, or the probability of a branch line from it being built to do the carrying-trade west of the Sacramento River.—One of the most important inland railroads in the State. Beginning at Vallejo and ending at Marysville, it passes through the richest agricultural districts in the State. Vallejo itself, an adjunct of San Francisco, must in the future become a great and important commercial, manufacturing and ship-building city. At present, through the California Pacific and its connecting lines, all the wheat of the western Sacramento Valley is poured into it. This road passes through one of the principal wheat-growing regions of the Coast,—one of the richest fields of waving grain. Northeast from Vallejo this line leads by a tunnel through the Suscol grain-covered hills; then past the thriving town of Woodland, through Davisville, a wheat-shipping centre, and eventually crosses the Sacramento by a splendid bridge, 600 feet long. From Davisville to Marysville, one of the most flourishing towns in the State,—its whole length is 165 miles. There is also a branch line connecting Vacca Station with Vacaville. At Marysville we find

The California and Oregon Railroad,

Which will reach from Roseville Station to Portland. It is now being rapidly pushed on, so as to reach the latter city and secure the trade of Oregon for the Central Pacific before the Northern Pacific is finished and is able to compete with it, and will soon be on the borders of Oregon. It will then have a length within California of two hundred miles. The section which it traverses is as fertile as any in the State, and its upper part, which comprises the counties of Shasta and Siskiyou, possesses, on its mountains, inexhaustible forests, the produce of which will, at no distant day, when carried down by rail to San Francisco and shipped thence by sea, supply all parts of the world with lumber. The railway will, too, open up the numerous and fertile valleys to be found in Northern California and Southern Oregon to the agriculturist, and conduce to their speedy settlement. This line passes, after leaving Marysville, through Chico, Tebama and Red Bluff, by Shasta and Yreka, to the borders of Oregon. Probably the most important of the internal lines is

The San Joaquin Valley Road,

Now completed to a short distance beyond Visalia, and which is 167 miles long—the largest road yet built in California. The valley is in parts 140 miles wide, and contains over six millions of acres of rich agricultural lands. Besides these, the country is covered with stock-raising lands, and the hilly and mountainous country bordering is capable of sustaining millions of sheep and cattle and of growing fruit and wine enough to supply all America. The whole western side of the San Joaquin Valley for more than one hundred miles, is now one vast wheat field, and it has been estimated that it would take four trains a day, of twenty cars each, to bring all the grain raised in the State to the coast. It will be in another year or two. Cotton, sugar, hemp and rice will be reckoned amongst the products of this valley, which will find an outlet over one or other of the many projected lines. The present one passes within six miles of Visalia, leaving that town to a certain extent out in the cold. But already are the Visalians bestirring themselves to take revenge, and inviting the approach of competing lines.

The North Pacific and Humboldt Railroad

Opens up the greatest lumber region of the Coast. Beginning at Donabue, it passes through Sonoma, Mendocino and Humboldt counties ending at Humboldt, a distance of about 300 miles from the starting point. It brings Petaluma, Santa Rosa, Healdsburg, Ukiah and Eureka, the centre of the lumber region of Humboldt and Del Norte counties, into quick and easy communication with the city, factoring the growing district, particularly in Russian River Valley, and has increased the value of the lands on the route, in some instances, as much as fifty per cent. The mountains that skirt the Coast are covered with magnificent forests, which will for another half century supply the manufacturing needs of San Francisco and the ship building ones of Vallejo. The scenery of the Coast range and Coast valley from Donabue is of the most picturesque description. The road has been opened to Cloverdale, 55 miles from Donabue; and the track is being laid down beyond that town with the utmost expedition. The first part of the line has cost \$13,000 per mile.

The Southern Pacific,

Intended to connect with the Texas or Atlantic and Pacific Roads has been finished as far as Hollister, 94 miles from this city, connecting by a branch line with Pajaro, and about to be connected by another with Santa Cruz. It passes through the beautiful and fertile valley of Santa Clara, connecting with San Francisco, San Jose, one of the largest cities in the State, Gilroy the center of what promises to be an immense tobacco growing district, and Hollister one of the most thriving towns in the southern section. Crossing the Mt. Diablo range probably through Pacheco Pass, it is proposed to run in a southeasterly direction through the lower San Joaquin Valley, approaching the San Joaquin River at Firebaugh's Ferry, then near Fresno City and north of the Tulare Lake to a point 20 miles below Visalia, then southward to Bakersfield, and through the range between the San Joaquin Valley to the South Tebatuchay Pass, thence nearly on the line of the 35th parallel to a point on the Colorado south of Fort Mohave, there forming a junction with the Texas Pacific. Twenty miles of it have already been built opposite Visalia beginning at Goshen.

Other Lines

Already built, but not of such importance as the foregoing, form the outlets to fertile and well cultivated districts, or necessary connections between other lines. They are, the Napa Valley Railroad starting from the California Pacific at a point seven miles northeast of Vallejo, and following the beautiful and fertile valley of the same name to Calistoga, 34 miles long; the San Rafael and Sonoma Railroad, 14 miles long; the two towns 14 miles long; the Marysville and Oroville Road, 26 miles long; the Sacramento Valley Railroad, connecting Sacramento and Folsom, and Folsom and Shingle Springs, passing to within 12 miles of Placerville, 49 miles long; the Stockton and Copperopolis Railroad conveying the product of the valuable copper mines of that section, to the Central Pacific line, and thence to this city, 11 miles long; the Milford eleven miles from Copperopolis, and 30 miles long; the connecting line between Niles Station and San Jose, 12 miles long; the Los Angeles and San Pedro line 22 miles in length, connecting the future capital of the south with its port; the branch line from Gilroy to Salinas, 34 miles in length; the San Pablo and Tulare Railroad grading from seven miles in length from Northville and Summerfield to New York and Pittsburg on the Sacramento, bringing down the coal of

Mount Diablo; the Alameda and Haywards line 17 miles; a short line from Sacramento to Freeport; the first section of the Stockton and Visalia railroad, which will run from Peters by Cotton Ferry to Visalia, now finished to Oakdale, a distance of 19 miles; and a line beginning 3½ miles west of Banta Station on the Central Pacific, intended to run down the western side of the San Joaquin Valley. The total length of all the lines which we have noticed in this article is, at present 1,131½ miles, when completed it will be 2,058½ miles. Besides these are numerous

Projected Lines,

And one, the Texas Pacific, which entering the State near its southern boundary on the Colorado River, will terminate in San Diego, opening up an immense extent of agricultural and mining country in Arizona and Southern California. Of the projected roads the most important to the State, and to our citizens generally is the Atlantic and Pacific from this city to St. Louis, 2,000 miles long, 300 miles of which runs through what will be in the future one of the richest parts of the State, which will not be affected by snow blockades, and will enable us to run it southerly along the coast to San Buenaventura, and thence by a route passing through Los Angeles and San Bernardino, to a point below Fort Mohave on the Colorado. Other projected roads are a coast road from San Francisco to San Diego, the North Pacific Coast Railroad from San Rafael to the Walhalla River; the California and Pacific extension to Red Bluff; the connecting line between the California and Pacific and Sacramento; the Bay shore line from Antioch to Oakland; the Sacramento Valley Railroad extension to Placer; the Copperopolis and Visalia Railroad; the Antioch and Visalia Railroad; a line from Visalia to Owens River; the extension of the San Pedro and Los Angeles road to San Bernardino, and south into Arizona; a line connecting Visalia and Los Angeles, another connecting San Diego and San Bernardino, and one from San Francisco by Sausalito, through Mendocino and Humboldt counties to Humboldt Bay, with branches leading into Napa and Sonoma counties, etc. The total length of these various lines would be upwards of 1,950 miles. The

Railroad Future of California

is most brilliant. We may predict that within the next decade there will be 4,000 miles in operation, and thus every part of our State with its magnificent resources, will be brought within easy reach of a profitable market, and thus afford inducements for the settlement of tens of thousands, who have hitherto been debarred seeking their fortunes by the broad waters of the Pacific. And the immense trade that will center in San Francisco from both the East and West, and in San Diego from Mexico, Arizona, Colorado and Texas will be something which is even now undreamt of.

NEW MACHINE WORKS.—The California Machine Works are just getting under way in a neat new building, No. 119 Beale street, in this city. The proprietors are Messrs. Alex. Steiger, John Argall, and Martial Hainque, who are also sole agents and manufacturers of Argall's steam heater and purifier, and Bargion's patent hubs and axles for wheels of agricultural machines, wagons etc. The firm intend manufacturing all descriptions of hoisting, pumping and mining machinery, quartz, saw and flour mills, and different kinds of iron and brass work. The majority of the tools for the shop are now on the way here from New Haven but the engine was started up this week. Particular attention is to be paid to general repairs, etc. The new shop is commodious and neat and the proprietors will endeavor to merit a generous share of public patronage.

THE HORSE DISEASE IN NEVADA.—The epizootic which has raged so extensively in the East of late has reached Nevada and is spreading there as it has done in other places. Horses and mules are alike affected by it and a stagnation of business is the consequence. At Eureka all the furnaces except the Ruby Consolidate have shut down and an effort is being made to reduce the wages of the miners employed at the Eureka Consolidate. A dispatch states that a number of them have quit work to go elsewhere. Ox teams have begun to haul freight from the railroad but the transportation of ore, etc., will be discontinued for the present. Business at Hamilton, White Pine, Pioche and Eureka is seriously affected.

PERSONAL.—We understand that Mr. Henry Sewell, mining engineer, is on a tour through the quicksilver mines of California, in the interest of a London firm. Mr. Sewell's long and practical experience in the mines of Almaden in Spain, and those of Mexico and Peru, undoubtedly warrant his countrymen in selecting him for the above purpose. We hope soon to publish his letter No. 2 on the "Quicksilver Mines of Almaden, Spain" in which we will describe, from his own personal observation, the geology and formation of these celebrated mines.

ASIATIC QUAIL.—Messrs. Liddle & Keating, of San Francisco, have received a lot of fifty Asiatic quail by the last steamer which are to be turned loose on the farm of Millard & Shafter, in Marin county, and on the property of Mr. Thompson in this county, that they may propagate and become domesticated in California. The quail is about the size of the California meadow lark, and is not unlike that bird in color.

AERIAL NAVIGATION.—San Francisco is being treated to the somewhat novel exhibition of balloon ascensions. Last Saturday, the balloon "New World" made an ascent from Woodward's Gardens, with four aeronauts, and the adventure will be repeated to-day. We have had a number of hot-air balloons before, but a gas balloon is a novelty in this city.

Scott's Wheel Moulding Machine.

We present to our readers this week a cut of Scott's Wheel Moulding Machine, for moulding gear wheels of every description, something which has been for some time in use in Europe and which seems particularly applicable for California. It has only recently been introduced in the Eastern States and is of great importance to iron foundries and all who have to bear the expense of producing gear wheels, or cast wheels of any description. It entirely obviates the necessity of having a pattern wheel, thereby effecting a great saving of expense in the production of moulds. It also insures the production of gear, or other wheels of assured accuracy of construction. The machine is able to mould spur, bevel, mortise or worm wheels, (plain or shrouded) fly wheels or pulleys, whole or fitted in segments, from 12 inches to 12 feet in diameter, from one inch to 18 inches face, in an accurate manner. A reference to the cut in connection with the following brief description will enable any one to form a correct idea of the apparatus.

The machine is portable, and may be readily moved to any part of the foundry, by attaching the foundry crane to the eye-bolt upon the top of the central shaft. It consists, first, of a pedestal to be imbedded about fifteen inches below the general level of the foundry, which supports a central vertical shaft, upon which the machine proper revolves; this may be adjusted at any height, to accommodate any required width of face. This adjustable machine consists of a slotted horizontal radial arm which carries at one end a vertical sliding ram, to which the segment of pattern is attached; the horizontal arm is adjustable by a long traverse side screw. The radial arm and ram are revolved by a large and carefully made worm wheel, by which the requisite angular motions corresponding to any desired pitch, are obtained in a manner similar to that by which the same is obtained in an ordinary gear cutting machine.

To obtain all the varieties of pitch from 20 to 560 teeth, a set of change wheels are employed, these are operated by a crank, the handle of which is convenient to the operator. The ram and segment are also moved vertically by another crank also convenient to his left hand. All that is required for the moulding of a wheel by this machine is a segment of two teeth, a core box for the arms and boss, and a board for striking the top and bottom of the wheel. Wheels are moulded by a segment of two teeth fixed upon the end of a revolving trammel, adjustable to the required diameter; the spacing of the teeth being effected by mechanism, the exact equivalent of that used to space the teeth in a gear cutting machine, as a consequence the teeth of all wheels cast by this machine, are as true as those which are cut by a Gear Cutter, and are much better, as the hard crust of the cast iron is preserved, and is in effect equal to steel, and produced at a greatly reduced cost. Gear wheels to fit a worm screw accurately can be moulded by this machine, and any other desired form of teeth which cannot be moulded by a pattern, can be as readily moulded as straight teeth.

In constructing wheels for the heavy hoisting apparatus now in use in our mines this is an invaluable agent. These wheels, which used to be large when they weighed 5,000 pounds, are made now weighing from 20,000 upwards and even 11 tons. When a wheel of this description is broken at a mine it is quite an extensive job to replace it. It is well known to foundries that patterns, especially in this country are liable to variation by contraction and expansion from atmospheric causes, and that no accurate wheel can be cast from a pattern thus changed until the additional expense of repairing is incurred; and in some instances a pattern is injured to such an extent that its perfect restoration is impossible. When an old pattern is used the wheel is not so good as in the first case for the reason mentioned above.

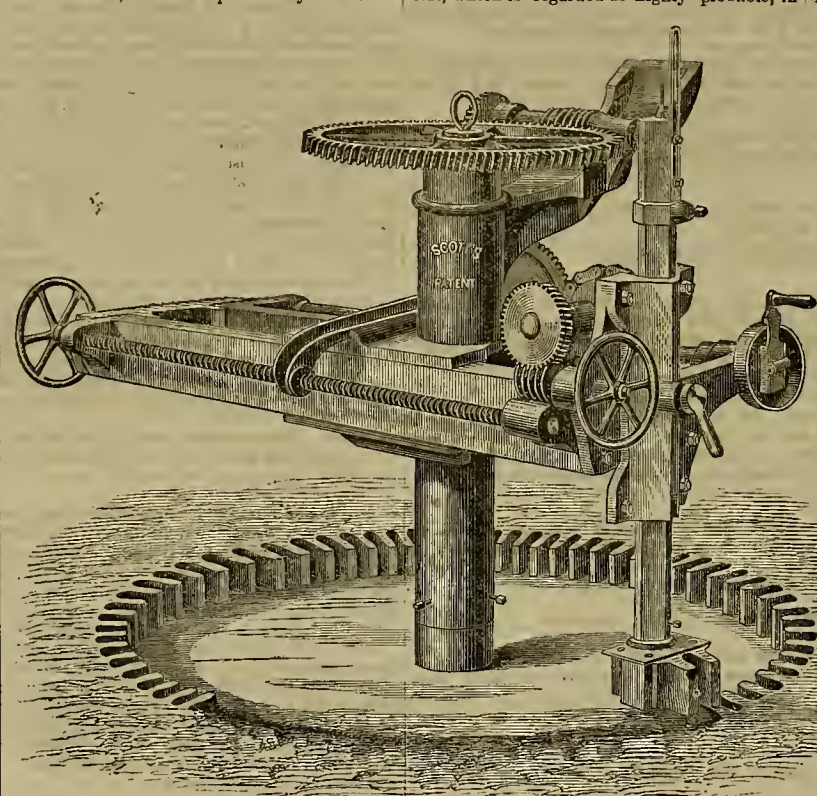
A foundry in Virginia City or elsewhere with this machine could immediately replace a broken wheel even as large as those at the Gould & Curry or Hale & Norcross mines. It makes them of any size and exactly true. In case of a fire at the foundry where the patterns are kept this machine could reproduce any wheel required without the necessity of new patterns being made, and at much less cost than where patterns are required. The manufacturers, the New York Moulding Machine Company

give the following illustration of the difference in cost of making a wheel by this machine and by the old method of moulding, giving the cost in days' labor instead of money value, so that a comparison can be more readily made, the rates of wages varying in different localities. A wheel was required to be cast four feet two inches in diameter at the pitch line, four-inch pitch, and 12½ inches broad. The construction of the pattern for the wheel cost 19 days and eight hours' labor. The construction of the woodwork for casting the same wheel by the Scott machine, cost only one day and five hours' labor. Another great advantage it has, is that a variety of patterns is dispensed with, and it is not necessary to keep a large stock of them on hand. One of these machines can be seen at David Stoddard's machine shop, 114 Beale street.

The Frear Stone in San Francisco.

The Frear Stone which proved so refractory to the action of fire in the great Chicago conflagration, and which is now playing so important a part in the reconstruction of that city is rapidly making its way into public favor in San Francisco.

It has been largely employed in the Niantic building, corner of Clay and Sansome streets, for buttresses, window caps and keystones. It



SCOTT'S PATENT WHEEL-MOULDING MACHINE.

also forms the ornamenting and projecting parts of the large three story building now being erected at the corner of Townsend and Fourth streets for the Central Pacific Railroad offices. The foundation of Tallant's large bank building corner of California and Battery streets, consists of this stone, which was placed in position when but two weeks old, and was even then considered amply firm enough to sustain the immense weight of the entire building.

We have a sample of this stone in our office, which presents the appearance of a beautiful clear sandstone. Other and larger samples can be seen at the Company's office, 638 Market street. It has successfully stood the test of fire and frost, of the sledge hammer and the crushing press, and is now considered fully equal, under all circumstances to which building stone is ever subjected, to the best class of natural building stone. There can be little doubt but that this durable and beautiful artificial stone is destined, at no distant day, to measurably supersede almost every other class of imperishable building material.

SIGNAL SERVICE BUREAU.—We have received from Gen. Albert J. Meyer, Chief Signal officer of the United States army, his annual report for 1872, to the War Department. It contains much interesting information in relation to this important branch of the Service, with a record of what has been accomplished, and instructions for meteorologists. The different instruments used are described at length with engravings, diagrams, etc.

Railroad Items, Etc.

It is currently reported that the Southern Pacific Railroad has been sold to Thomas Scott by Governor Stanford. The Southern Pacific runs from this city by way of San José and Gilroy through the Salinas Valley and connects with roads to San Diego by way of Los Angeles, finally meeting the 32d parallel road now being built. It is not known whether this is really the case, but the *Chronicle* thinks that the probabilities very strongly point to that consummation.

The North Pacific Railroad, which was sold by Peter Donahoe to the Central Pacific for \$750,000 some time since, has been repurchased by that gentleman for \$1,000,000, according to the *Petaluma Argus*. Rumors to this effect have been current for some days. The road runs from Vallejo by way of Petaluma and Healdsburg to Cloverdale.

A dispatch dated Chicago, Jan. 23th, states that a Washington special says that it is rumored there that a pool is now being formed in which the Bank of California and the Central Pacific Railroad Company are the responsible parties, for the purchase of the Union Pacific Railroad in case the June interest on the bonds of the latter corporation go to protest, which is regarded as highly probable, in

Legitimate Labor vs. Speculation.

By ALMARIN B. PAUL.

No system of speculation ever builds up a country in material wealth, or a people in a moral sense, and it matters not whether a gain is made from wheat, trade or mining.

Legitimate labor is ever a producer, whether applied to commerce, mining or agriculture, and whether the individual is personally benefited or not. Every bar of metal thrown into circulation, every grain of wheat raised, gives forth some good. It therefore behooves all to give greater encouragement to legitimate endeavors, and to discountenance speculation. Of all countries, California, from the previous condition of things, possibly, holds a larger percentage of speculators than any portion of the civilized world, and by far the largest number are embraced among the

Mining Fraternity.

The past year has presented some fine illustrations of the speculative spirit which pervades this coast, and how powerful "speculation" is, to draw open the purses of our prominent men of finance, while silk culture and a horde of other important interests are left to fight the battle of poverty for want of legitimate aid.

A million of dollars for diamond fields—unknown—while so many interests are lavishing!

It is to say lamentable, and by no means creditable, to those whose wealth point them out as those who should only associate their capital and names for higher, and more legitimate purposes, such as the building up of hives of industry. But enough of this, my object now is, to stir a certain class of miners, to more legitimate labor. Those who are ever on the prospect—the "hold out" and "bond," and never consummate anything; those who "speculate;" those who now and then play with stocks, and think they are smart, but soon find out they are enveloped by as powerful a sucker as Higo's devil fish.

There is no doubt but all will admit that the road having the most sweet bread for the traveler, is in the course of legitimate endeavors; those who travel on it, can generally sleep sound and pay their way as they go.

Nature has thrown broadcast her precious metals that men may delve and reap their rewards in an honest pursuit of wealth, and only legitimate labors can produce it.

That there must be some venture as connected with mining all must grant, but even this should be based on our endeavor to produce interest upon capital invested.

Strictly speaking, after a reasonable expenditure for development of a mine, and for machinery to reduce ore, unless mines pay a revenue, they are not worth having; and it is about time the whole mining community accepted this idea of value. Profit alone should create value, and not manipulations behind the scenes, and that value estimated as interest on money.

One great point for the bringing forth of more legitimate mining is for the mining communities to keep their capital among themselves, instead of rushing all their gains into the banks of San Francisco. This can be done by forming Savings and Loan Associations, as those of this city, and whereby capital can be disbursed among themselves.

Away from San Francisco, all complain that no loans can be had from this city on their property. There are several good reasons for this. 1st.—The farther from home you send capital the less can be made out of it. It has left home-avenues of trade. 2d.—Capital in the city can form no correct estimate value of country property, and, besides, don't want to. Loan societies of their own could always loan understandingly, and, besides, would acknowledge a greater value.

This lack of a little capital in localities where needed, induces much speculation, as it leaves the miser with the only hope of rushing to San Francisco for "capital," where he gets his property "stocked," and then, unless money can be made by "speculation" out of paper, little is done. That locality "wits" for capital, whereas, on the other hand, with a little from home, a revenue would be the result. There is one fact which has forced itself very strongly upon my mind in this connection, viz.: that men of even small means,—and who could cooperate with their limited capital,—are more disposed to waste it in stock speculations than to organize, cooperate, open mines and erect machinery in accordance with their united capital.

Legitimate mining, though as a very small beginning, has more success to show for the endeavors made than where there has been the advantages of a large amount of capital. There is much truth in the saying that small beginnings make large endings. Legitimate endeavors augment, while speculation totters and soon falls with a crash. The one enriches and elevates the individual and a people, the other demoralizes and drags down. There is neither money nor morale in so much speculation; so let us drop it and build up ourselves and State in fostering those industries and ventures which have reality at the back of them.

SAN JOAQUIN VALLEY NARROW GAUGE ROAD.—Enough money has been paid in, according to the *Stockton Republican*, to organize the Stockton and Visalia Narrow Gauge Railroad Company and arrangements are now being made to incorporate it.

Laws Under New California Code—Taking Effect Jan. 1, 1873.

Formation of Corporations.

(Continued from page 58.)

[Five corporators, three to be citizens of the State to sign articles and acknowledge the same.]

292. The articles of incorporation must be subscribed by five or more persons, three of whom must be citizens of this State, and acknowledged by each before some officer authorized to take and certify acknowledgments of grants of real property.

[Prerequisite to filing articles.]

293. Each intended corporation named in Section 291, before filing articles of incorporation, must have actually subscribed to its capital stock, for each mile of the contemplated work, the following amounts, to wit:

[Amounts to be subscribed to be affixed.]

1. One thousand dollars per mile of railroads;
2. One hundred dollars per mile of telegraph lines;
3. Three hundred dollars per mile of wagon roads.

[Prerequisite to filing articles of corporations for profit.]

294. Before the articles of incorporation of any corporation referred to in the preceding section are filed, there must be paid for the benefit of the corporation, to a Treasurer elected by the subscribers, ten per cent. of the amount subscribed.

[Oath of officer to subscription of stock and payment of ten per cent.]

295. Before the Secretary of State issues to any such corporation a certificate of the filing of articles of incorporation, there must be filed in his office an affidavit of the President, Secretary or Treasurer named in the articles, that the required amount of the capital stock thereof has been actually subscribed, and ten per cent. thereof actually paid to a Treasurer for the benefit of this corporation.

[To file articles with County Clerk and Secretary of State, and receive certificate. Term of existence.]

296. Upon the filing of the articles of incorporation in the office of the County Clerk in the county where the business of the company is to be transacted, and a copy thereof with the Secretary of State, the Secretary of State must issue to the corporation over the great seal of the State, a certificate that such articles, containing the required statement of facts, have been filed in his office, and thereafter the persons signing the same, and their associates and assigns, are a body politic and corporate, by the name stated in the certificate, and for the term of fifty years, unless it is in the articles of incorporation otherwise stated, or in this Part otherwise specially provided.

[Certified copy of certificate to be prima facie evidence of its contents.]

297. A copy of any articles of incorporation filed in pursuance of this Chapter, and certified by the Secretary of State, must be received in all the Courts and other places as primary evidence of the facts therein stated.

[Who are members and who stockholders of a corporation.]

298. The owners of shares in a corporation which has a capital stock are called stockholders. If a corporation has no capital stock, the corporators and their successors are called members.

[When members die successors to be elected.]

299. If a member of a corporation dies, resigns, or is removed, a majority of the remaining members may elect another in his place.

By-Laws, Directors, Elections and Meetings.

[Adoption of by-laws, when, how, and by whom.]

301. Every corporation formed under this Title must, at a meeting of its stockholders or members, to be held within one month after filing articles of incorporation, adopt a code of by-laws for its government not inconsistent with the Constitution and laws of this State. Notice of such meeting, by order of the acting President, specifying its object, must be published two weeks in some newspaper published in the county where the meeting is to be held; or, if none is published therein, then in a paper published in an adjoining county. In the adoption of the by-laws, each stockholder has as many votes as he holds shares of the stock; if there is no capital stock, each member has one vote. A majority of all the subscribed capital stock, or of the members, if there is no capital stock, is necessary to adopt the by-laws, or any one of them.

[Directors, election of, etc.]

302. The Directors of a corporation must be elected annually by the stockholders or members, and if no provision is made in the by-laws for the time of election, the election must be held the first Tuesday in June. Notice of such election must be given, and the right to vote determined as prescribed in Section 301.

[By-laws may provide for what.]

303. A corporation may, by its by-laws, where no other provision is specially made, provide:

1. The time, place, and manner of calling and conducting their meetings;
2. The number of stockholders or members, or the quantity of stock constituting a quorum;
3. The number of shares which entitles the stockholders respectively to one or more votes;
4. The mode of voting by proxy;
5. The time and place of the annual election for Directors, and the mode and manner of giving notice thereof;
6. The mode of selling shares for the non-payment of assessments or installments.
7. The compensation and duties of officers.
8. The tenure of office of subordinate officers; and,
9. Suitable penalties for violations of by-laws, not exceeding, in any case, one hundred dollars for any one offense.

[By-laws recorded and how amended.]

304. All by-laws adopted must be certified by the officers of the corporation, and filed and recorded in the Recorder's office of the county where the principal place of business of the corporation is located. The by-laws thus adopted must not be altered or amended, except at a special meeting of the stockholders or members, to be called by the Directors for that purpose, specifying in the order the proposed amendments; and a two-third vote of all the subscribed capital stock, or of the members is necessary to adopt the same. And the amendments thus adopted must be certified and recorded in the same manner as the original by-laws.

[How many and who to be Directors.]

305. The corporate powers, business, and property of all corporations formed under this Title must be exercised, conducted, and controlled by a Board of not less than five nor more than eleven Directors, to be elected from among the holders of stock; or where there is no capital stock, then from the members of such corporation. A majority of the Directors must be citizens of this State. Directors of corporations for profit must be holders of stock therein in an amount to be fixed by the by-laws of the corporation. Directors of all other corporations must be members thereof. Unless a quorum is present and acting, no business performed or act done is valid as against the corporation. Whenever a vacancy occurs in the office of Director, unless the by-laws of the corporation otherwise provide, such vacancy must be filled by an appointee of the Board.

[Corporations at first meeting to elect Directors and adopt by-laws.]

306. At the first meeting called, as soon as the by-laws are adopted, unless it is provided that the officers named in the articles of incorporation shall continue until a certain other date, Directors must be elected, a majority of the subscribed capital stock, or of the members being necessary to a choice.

[Elections, how conducted.]

307. All elections must be by ballot, and unless otherwise prescribed by the by-laws, a majority of the subscribed capital stock or of the members is necessary to a choice.

[Organization of Board of Directors, etc.]

308. Immediately after their election, the Directors must organize by the election of a President, who must be one of their number, a Secretary and a Treasurer. They must perform the duties enjoined on them by law and the by-laws of the corporation. A majority of the Directors is a sufficient number to form a Board for the

transaction of business, and every decision of a majority of the Directors forming such Board, made when duly assembled, is valid as a corporate act.

[Dividends to be made from surplus profits.]

309. The Directors of corporations must not make dividends, except from the surplus profits arising from the business thereof; nor must they divide, withdraw, or pay to the stockholders, or any of them, any part of the capital stock, nor must they create debts beyond their prescribed capital stock, or reduce or increase the capital stock, except as hereinafter specially provided. For a violation of the provisions of this section, the Directors under whose administration the same may have happened (except those who may have caused their dissent therefrom to be entered at large on the minutes of the Directors at this time, or were not present when the same did happen) are, in their individual and private capacity, jointly and severally liable to the corporation, and to the creditors thereof, in the event of its dissolution, to the full amount of the capital stock so divided, withdrawn, paid out, or reduced, or debt contracted; and no statute of limitations is a bar to any suit against such Directors for any sums for which they are made liable by this section. There may, however, be a division and distribution of the capital stock of any corporation which remains after the payment of all its debts, upon its dissolution or the expiration of its term of existence.

[Removal from office of Directors, etc.]

310. No Director shall be removed from office, unless by a vote of two-thirds of the members or of stockholders holding two-thirds of the capital stock, at a general meeting held after previous notice of this time and place, and of the intention to propose such removal. Meetings of stockholders for this purpose may be called by the President or by a majority of the Directors, or by members or stockholders holding at least one half of the votes. Such calls must be in writing, and addressed to the Secretary, who must thereupon give notice of the time, place, and object of the meeting, and by whose order it is called. If the Secretary refuse to give the notice, or if there is none, the call may be addressed directly to the members or stockholders, and be served as a notice, in which case it must specify the time and place of meeting. The notice must be given in the manner provided in Section 301 of this Title, unless other express provision has been made therefor in the by-laws. In case of removal, the vacancy may be filled by election at the same meeting.

[Justice of the Peace may order meeting, when.]

311. Whenever, from any cause, there is no person authorized to call or to preside at a meeting of a corporation, any Justice of the Peace of the county where such corporation is established, may, on written application of three or more stockholders or of the members thereof, issue a warrant to one of the stockholders or members directing him to call a meeting of the corporation, by giving the notice required, and the Justice may in the same warrant direct such person to preside at such meeting until a Clerk is chosen and qualified, if there is no other officer present legally authorized to preside thereat.

[Majority of stock must be represented, and a majority vote together, otherwise it is fraudulent.]

312. At all elections or votes had for any purpose there must be a majority of the subscribed capital stock, or of the members, represented, either in person or by proxy in writing. Every person acting therein, in person or by proxy or representative, must be a member thereof or a bona-fide stockholder, having stock in his own name on the stock books of the corporation at least ten days prior to the election. Any vote or election had other than in accordance with the provisions of this Article is voidable at the instance of absent stockholders or members, and may be set aside by petition to the District Court of the county where the same was held. Any regular or called meeting of the stockholders or members may adjourn from day to day, or from time to time, if for any reason there is not present a majority of the subscribed stock or members, or no election or majority vote had—such adjournment and the reasons thereof being recorded in the journal of proceedings of the Board of Directors.

[All stock may be represented in votes.]

313. The share of stock of an estate of a minor, insane, or deceased person, may be represented at all elections and meetings of the corporation by the legal representative of the person holding the same.

[Election may be postponed.]

314. If from any cause an election does not take place on the day appointed in the by-laws, it may be held on any day thereafter as is provided for in such by-laws, or to which such election may be adjourned or ordered by the Directors. If an election has not been held at the appointed time, and no adjourned or other meeting for the purpose has been ordered by the Directors, a meeting may be called by the stockholders, as provided in Section 310 of this Article.

[Complaints and quo warranto and proceedings thereon regarding elections.]

315. Upon the application of any person or body corporate aggrieved by any election held by any corporate body, or any proceedings thereof, the District Judge of the district in which such election is held must proceed forthwith summarily to hear the allegations and proofs of the parties, or otherwise inquire into the matters of the complaint, and thereupon confirm the election, order a new one, or direct such other relief in the premises as accords with right and justice. Before any proceedings are had under this section five days' notice thereof must be given to the adverse party, or those to be affected thereby.

To be Continued.

Virginia and Gold Hill Water Company.

This company, says the Gold Hill News, has completed all the grading for the foundation of their flume, both this side of Washoe Valley and beyond up into the foothills of the Sierra Nevada mountains. It yet remains to dig the trench across the valley, in which the huge iron pipe is to be laid. This pipe is now being manufactured in San Francisco and will be ready to be laid sometime in March. There is still a vast amount of work to be done in the way of flume building, to say nothing of the work of laying the pipe. On the summit of the ridge, in a southerly direction from the Ophir Grade toll-house, will be built an immense reservoir, from which the mines and mills of Gold Hill and Gold Cañon generally will be supplied. Work has not yet commenced on this reservoir, we believe, but we presume men will be set to work upon it early in the spring. The company will be able to give employment to a great number of men during the coming spring and summer. We hope they will push the work as rapidly as possible, as water is likely to be a scarce article in Gold Hill during the coming season; in fact, before the recent good storm water was not to be had for drinking and culinary purposes, and most of that was hauled from American Flat. We noticed yesterday that water is being hauled down into town on sleds from the Imperial hoisting works. Push the work as they may the company cannot bring the water in any too soon to meet the requirements of our people. There will be great rejoicing when we can have in all our homes the pure water of the Sierra Nevada mountains.

GRASS VALLEY MINES.—To look at and ride over, the main streets of Grass Valley, would induce a stranger to answer "Old Block's" question, "Is Grass Valley played out?" in the affirmative; but this reports from the mines in the vicinity would soon destroy the impression and the dilapidated condition of the streets could be accounted for in the lack of enterprise on the part of property holders. The mines are improving continually. The recent strike in the North Star is most encouraging from the fact that it is the deepest mine in the district, and the croakers had begun to say quartz would not yield at great depths and to point to the North star as an example. Now that these predictions have failed and the rock has been found, these same class exclaim "I told you so all the time. All it wants to make a mine pay is to go down on it." We understand that the mining prospect is most encouraging and there are numerous chances in the vicinity for opening just as rich mines as Grass Valley has ever boasted of. All that is required is capital controlled by men who understand the business of mining. We hope soon to hear of new projects backed by capital and we are confident in such an event new and rich mines will be multiplied in Grass Valley district.—*Transcript*.

Two years ago a lead mine was discovered in Hardin County, Ill. The ore was rich and plenty, but no process of smelting had been discovered which would master the unusual combination of minerals contained in this ore. The Mineral City Mining Company has at last discovered the secret, and confirmed the victory by a \$6,000 cash sale of the same.

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PATENTS & INVENTIONS.

Telegraphic List of U. S. Patents Issued to Pacific Coast Inventors.

REPORTED OFFICIALLY FOR THE MINING AND SCIENTIFIC PRESS, DEWEY & CO., PUBLISHERS AND U. S. AND FOREIGN PATENT AGENTS.
By Special Dispatch, Dated Washington, D. C., Jan. 28th, 1873.

FOR WEEK ENDING JANUARY 14th, 1873.

NEEDLE CASE.—Gerhard Wempe, S. F., Cal. SEDIMENT COLLECTOR AND BLOW OFF FOR STEAM BOILERS.—John P. Leonard and George Hancock, Oroville, Cal.

The patents are not ready for delivery by the Patent Office until some 14 days after the date of issue.
NOTE.—Copies of U. S. and Foreign Patents furnished by DEWEY & CO., in the shortest time possible (by telegraph or otherwise) at the lowest rates. All patent business for Pacific coast inventors transacted with greater security and in much less time than by any other agency.

New Incorporations.

The following companies have filed certificates of incorporation at the County Clerk's Office in this city:

GUADALUPE ISLAND CO.—Jan. 23. Object: Agriculture and Stock Raising, and the improvement of the breed of domestic animals. Capital stock, \$500,000, in shares of \$50 each. Trustees—George N. Dent, Henry Delahide, Cassius C. Palmer, of San Francisco; Wm. M. Landrum, and Jesse M. Rodgers, of Watsonville.

GERMANIA M. CO.—Jan. 25. Location: State of Nevada and Territory of Utah. Capital stock, \$3,000,000. Trustees—George Helm, William Lephman, Samuel Purdy, Frank Moyer, F. C. Jessup.

HYDROLENE M. CO.—Jan. 25. Location: California, Nevada and Utah. Capital stock, \$1,000,000. Trustees—Alexander L. Warner, Ezekiel Tripp, Spafford O. Field, C. O. Warner and D. K. Tripp.

BLUE POINT GRAVEL M. CO.—Jan. 29. Location: Blue Point claims, in Shesler Flat, and Empire Mining District, Rose's Bar, Yuba Co., Cal. Capital stock, \$12,000, in 24 shares of \$500 each. Trustees—Lyman Ackley, R. Cray and J. Whalan. The principal place of business has been removed from Smartsville to San Francisco.

SAN GABRIEL M. CO.—Jan. 29. Location: Los Angeles County. Capital stock, \$500,000, in shares of \$100 each. Trustees—Robert T. Patterson, Everton W. Hawley, Henry H. Allen, Wm. McDonald and Geo. Spencer.

PATTERSON & HAWLEY PLACES M. CO.—Jan. 29. Location: Los Angeles County. Capital stock, \$500,000, in shares of \$100 each. Trustees—Robert T. Patterson, Everton W. Hawley, Henry H. Allen, Wm. McDonald, George W. Spencer.

Meetings and Elections.

SPRING MOUNT M. CO.—Jan. 27. Trustees—L. Maynard, Thomas Ball, C. D. Sullivan, J. H. Baird and R. S. Floyd.

SAN JUAN DEL RIO M. CO.—Trustees—John E. Magee, Chas. W. Coon, John W. Dwinelle, Jasper O'Farrell and William E. Darby.

LANE AND KURTZ CARBON M. CO.—Jan. 27. Trustees—Joseph Clark (President), Ira P. Rankin, George Hearst, J. B. Haggin, C. R. Greathouse, B. B. Morrow, Secretary, Superintendent, C. C. Lane.

BLACK DIAMOND COAL CO.—Jan. 22. Trustees—D. O. Mills, A. Hayward, P. B. Cornwall (President), Thomas Bell and John Bensley.

BELLINGHAM BAY COAL CO.—Jan. 22. Trustees—D. O. Mills, A. Hayward, P. B. Cornwall (President), Thomas Bell and John Bensley.

BELCHER M. CO.—Jan. 23. Trustees—J. D. Fry (President), A. R. P. Harmon (Vice-President), R. F. Morrow, James H. Dobson and B. F. Sherwood; Secretary, H. C. Kibbe; Superintendent, W. H. Smith.

RAYMOND & ELY M. CO.—Trustees—Alphus Bull (President and Treasurer), W. H. Raymond, S. F. Butterworth and Henry Raymond; A. J. Moulder was re-elected Secretary.

INCREASE OF CAPITAL STOCK.—Sutro Tunnel Co.—Jan. 23. Capital stock increased from \$12,000,000 to \$15,000,000, in shares of \$10 each. Capital stock fully paid-in is \$1,032,122.25, and there are no debts.

COPPER.—According to James Lewis & Sons' January Report on Ores and Metals, 200 tons of California ore to arrive in Liverpool, sold on the 1st at 18s., and good brands of bars on the spot at £93. Stocks of West Coast produce were estimated at 23,441 tons fine against 23,462 tons on the 1st of December. On the reduction of the rate of the Bank of England to five per cent. on the 12th, and advice of the fortnight's charter as only 1,300 tons fine, on the 13th of December, the tone of the market, improved, and the consumptive demand being supplemented by extensive purchases of best select from America, with considerable disinclination on the part of holders to sell, prices have gradually advanced, and as high as £91 10s has been paid for good brands on the spot. Latest quotations are as follows: £91 10s for good brands; £90 to £90 10s for Lota on the spot; with £1 to £2 additional for arrival according to date. 17s 3d for ore, and 17s 6d for Regulus at Swansea; 17s 6d to 18s for Ore and Regulus at Liverpool.

THE CALIFORNIA PLACARD EXCHANGE.—The certificate of incorporation of an advertising company, hearing the above title, has been placed on record the past week. The object of this Association is to collect and hold for exhibition samples of the natural wealth and resources of the State of California, and the coasts and islands of the Pacific Ocean; to collect and supply information concerning the same or other topics; to exhibit and distribute placards, containing business and other announcements, and to conduct a general printing and publishing business. The plan contemplates the daily placard on which will be conspicuously shown every important business notice on record which appears in any paper in the city, of the day, and all other important information, which can be collected by the Association.

MINERS' STRIKE.—Sutter Creek is again the scene of a miners' strike. Last Saturday the miners in the employ of the Lincoln Company were notified that hereafter the night shift would be required to work full time Saturday nights. The custom has been to knock off at midnight, so being dissatisfied with the order, the miners struck and quit work on Monday. About 70 of the strikers asked the men still at work to quit, which some of them refused to do. On Tuesday the strikers reiterated the demand, which led to a dispute, during which several shots were fired and one man was seriously injured.

MINING SUIT.—The Raymond & Ely Mining Company have commenced suit to recover from the Pioche-Phoenix Company, that portion of 525 feet on the Raymond & Ely lode running west from the famous Lightner shaft, which is now held by the Pioche-Phoenix Company. The title to 400 feet of this belongs to the Raymond & Ely Company, as the other company admit, so the suit is really for the remaining 125 feet. This is probably a test case of the Panaca title, which covers a tract two miles long and 1,000 feet wide, including several claims. As the district was abandoned for four years at one time, the opinion of parties interested is that the Panaca title was forfeited by that action.

SAN FRANCISCO BOILER WORKS.—At these works they are just completing a large direct flue and return tubular boiler for the steamer "Pelican." The boiler is 22 feet long, 13 feet in diameter, with a steam chimney 7½ feet in diameter and 7 feet high. It contains 2,800 feet of heating surface. The old boiler of the "Pelican" were not adapted for the fuel used here, and this one was made to replace them. Mr. Curry has just built a boiler for the Willamette Iron Works, Portland, Oregon, and will shortly build another locomotive shape marine boiler. They are now making a dozen mining cars for the Golden State Foundry, and 850 feet of pipe column for mining purposes.

THE INDIAN WAR.—The Modoc Indians, after having been successful in one fight, have this time been repulsed by the troops. Several companies of soldiers are now on the way to Oregon to aid the forces now there. It is supposed that the Indians have been reinforced since their last battle, since they made the attack themselves in this fight, but were repulsed.

THE STOCKTON PAPER MILL is turning out a fair quality of white paper and excellent straw wrapping paper. It is stated by the *Republican* that the company will shortly remove the Santa Cruz mill to Stockton to run in connection with the one now in operation, when they will be able to turn out about five tons per day of newspaper made from straw.

GEOLOGY AND MINERALOGY.—A class in local and mining geology was organized on Tuesday evening last at the Mechanics' Institute by Amos Bowman, of the State Geological Survey. Mr. Henry G. Hanks is also forming a class in determinative mineralogy and use of the blow-pipe, at 649 Clay street.

CORRECTION.—In our last issue in speaking of an improved safety bellows, we stated that the patent safety valve was the only one used. There are two valves, the usual one being placed in the bottom, and the Hendy safety valve is also used, being placed on top to prevent explosions.

UTAH NARROW GAUGE.—At a late meeting of the directors of the Utah Narrow Gauge Railroad Company, it was unanimously resolved to explore the road to Helena, Montana; work on the Corinne branch is to be immediately begun.

RUMOR says that Henry Janin, the mining engineer of diamond-field fame has gone to South America in the interest of capitalists of this city, to report on some mines there.

STORM IN UTAH.—The late severe storms in Utah have had the effect of completely blocking up the roads to the Cottonwood mines much to the inconvenience of the miners.

PERSONAL.—We were favored this week by a call from Mr. L. F. McCarty, corresponding agent of the MINING AND SCIENTIFIC PRESS and the PACIFIC RURAL PRESS. Mr. McCarty is a courteous, affable gentleman, and one of the finest solicitors on the coast. He represents two of the most valuable journals in the State—papers which every farmer and mechanic should subscribe for. (Gilroy Advocate, Jan. 25th.)

HINTS FOR INVENTORS. We will send on receipt of stamp for postage, FREE, our 32-page Circular, containing 112 Illustrated Mechanical Movements; a digest of PATENT LAWS; information how to obtain patents, and about the rights and privileges of inventors and patentees; list of Government fees, practical hints, etc., etc. Address DEWEY & CO., Publishers and Patent Agents, San Francisco.

THE office of the SAN FRANCISCO NEWS LETTER, CAL. CHINA MAIL, CAL. MAIL BAG, and other publications issued at the NEWS LETTER office, have been REMOVED to the New and Spacious Building of the CALIFORNIA PLACARD EXCHANGE, Nos. 505 to 515 Merchant street, above Montgomery.

A NEW BOOK ON MINING.

The Explorers', Miners' and Metallurgists' Companion; Comprising a Practical Exposition of the Various Departments of Exploration, Mining, Engineering, Assaying, and Metallurgy. The Most Practical and Comprehensive Work on Mining Subjects Extant. Comprising 540 Pages, and 81 Engravings. By J. S. Phillips, M. E. Price, bound in cloth, \$10 (in coln); in leather, \$12. Forwarded by mail, in cloth, \$11.40, currency; in leather, \$13.75. Issued and for sale by DEWEY & CO., Patent Agents and Publishers Mining and Scientific Press, S. F.

PACIFIC MINERAL LAND OFFICE.—HOTY, SEARS & MCKEE—MERCHANTS' EXCHANGE, CALIFORNIA STREET, SAN FRANCISCO, CAL.—Mining Patents obtained for claims in California, Nevada, Utah, Arizona, and elsewhere. Plans and papers prepared for adverse claimants, as required by the new law; relocations effected where claims have lapsed under the Congressional Act of May 10, 1872; Mining Contests conducted before the Departments and Courts.

Mr. McKee's experience as Chief of the Mining Claims Division, General Land Office, Washington, D. C., will be valuable to parties desiring to properly appear either as claimants for patents or as adverse claimants. Cases attended to in person at any of the District Land Offices, or at the Department at Washington, where deemed necessary. JAS. T. HOTY, W. H. SEARS, C. H. MCKEE. 1725-26m

WONDERFUL CURE.—A young man, a resident of this city, gives us the facts of the following remarkable cure. He says: "I suffered with Catarrh in its worst form. Bones came from my nose; my breath became offensive; I was compelled to eat alone. I had given up all hopes of being cured. At this time met Dr. Evory, of Chicago, who had been cured by a remedy discovered by himself. I tried the remedy, with little faith; but at the end of three months found myself cured." Our informant was now associated himself with the discoverer in the manufacture of the article, which will be found under the name of the Diamond Catarrh Remedy. Price 50 cts.; sent by mail for 50 cts. A. F. EVORY & CO., No. 9 Post street, San Francisco. Sold by all druggists. 25v25-3m

CONTINENTAL LIFE INSURANCE CO., No. 302 Montgomery street, corner of Pine.

For the very Best Photographs go to BRADLEY & RULOFSON'S GALLERY, with an "Elevator," 429 Montgomery street, San Francisco. 25v13m-cowpb

FOR SALE.

A Desirable Investment.

One Hundred Shares Stock in the California Paper Manufacturing Company. JOHN C. MERRILL, President. Trustees—J. A. SWAIN, HENRY DOTSON, W. W. MONTAGUE, J. B. DOR, L. H. BOWEN.

Mill Located in Stockton.

Apply to HENRY F. WOOD, Office 5, No. 120 Montgomery street. fel-16

NARROW GAUGE FOR THE DENVER RAIL.

APPLY TO

PORTER, DONALDSON & CO.,

Corner Sansome and Hallock streets, SAN FRANCISCO. fel-1m

MAGAZINES.	P. An.	W. E. LOOMIS.
Harper's.....	\$4 00	News Dealer
Godley.....		AND STATIONER,
New York Ledger.....		S. E. corner of Sansome and
Blackwood.....		Washington streets,
Hours at Home.....	3 00	SUPPLIES ALL
Peterson's.....		Eastern Periodicals,
Arthur.....		BY THE
Lady of the Pen.....	5 00	Year, Month, or Number.
Chimney Corner.....		
Literary Album.....	5 00	
London Society.....		
All the Year Round.....		
London Th. News.....	15 00	

Mining and Other Companies.

Due to the time necessary to mail the present large edition of the M. & S. Press, we are obliged to go to press on Thursday evening—whenever the very latest hour we can receive advertisements.

Amazon Silver Mining Company—Location

of works, Ely District, Lincoln County, Nevada. NOTICE.—There are delinquent upon the following described stock, on account of assessment levied on the 23d day of October, 1872, the several amounts set opposite the names of the respective shareholders as follows:

Names.	No. Certificate.	No. Shares.	Amount.
H. McPherson, Trustee.....	2	50	\$ 5 00
H. McPherson, Trustee.....	3	50	5 00
H. McPherson, Trustee.....	4	50	5 00
H. McPherson, Trustee.....	5	50	5 00
H. McPherson, Trustee.....	6	50	5 00
H. McPherson, Trustee.....	7	50	5 00
H. McPherson, Trustee.....	8	50	5 00
H. McPherson, Trustee.....	9	50	5 00
H. McPherson, Trustee.....	10	100	10 00
H. McPherson, Trustee.....	11	50	5 00
H. McPherson, Trustee.....	12	50	5 00
H. McPherson, Trustee.....	13	2545	254 50
H. McPherson, Trustee.....	14	2545	254 50
H. McPherson, Trustee.....	15	2545	254 50
H. McPherson, Trustee.....	16	2545	254 50
H. McPherson, Trustee.....	17	2545	254 50
H. McPherson, Trustee.....	18	2545	254 50
H. McPherson, Trustee.....	19	2545	254 50
H. McPherson, Trustee.....	20	2545	254 50
H. McPherson, Trustee.....	21	2545	254 50
H. McPherson, Trustee.....	22	2545	254 50
H. McPherson, Trustee.....	23	4500	450 00
H. McPherson, Trustee.....	24	1373	137 30
H. McPherson, Trustee.....	25	1272	127 20
H. McPherson, Trustee.....	26	1272	127 20
H. McPherson, Trustee.....	27	1272	127 20
H. McPherson, Trustee.....	28	1495	149 50
H. McPherson, Trustee.....	29	500	50 00
H. McPherson, Trustee.....	30	500	50 00
H. McPherson, Trustee.....	31	500	50 00
H. McPherson, Trustee.....	32	500	50 00
H. McPherson, Trustee.....	33	250	25 00

And in accordance with law, and an order of the Board of Trustees, made on the 22d day of October, 1872, so many shares of each parcel of said stock as may be necessary, will be sold at public auction, at the office of the Company, No. 509 Sacramento street, San Francisco, California, on the fourteenth day of February, 1873, at the hour of 1 o'clock P. M. of said day, to pay said delinquent assessment thereon, together with costs of advertising and expenses of sale.

M. J. McMANUS, Secretary pro tem. Office, 609 Sacramento street, San Francisco, Cal. ja25-

Admiral Nelson Tunnel and Mining Com-

pany—Location of works, Emma Hill, Little Cottonwood Mining District, Salt Lake County, Utah Territory. Principal place of business, in the city of San Francisco, Cal. Notice is hereby given that at a meeting of the Board of Directors of said Company, held on the 27th day of January, A. D. 1873, an assessment of ten cents per share was levied upon the capital stock of the corporation, payable immediately in United States gold and silver coin, to the Secretary of the company, at his office, room No. 1, in the building known as Montgomery Block, on the southeast corner of Montgomery and Washington streets, in the city of San Francisco, California. Any stock upon which said assessment shall remain unpaid on Saturday, the 8th day of March, A. D. 1873, will be delinquent, and will be duly advertised for sale at public auction, and unless payment shall be made before, will be sold on Monday, the 31st day of March, A. D. 1873, to pay the said delinquent assessment, together with costs of advertising and expenses of sale. By order of the Board of Directors.

H. SINTON, Secretary. Office, No. 1 Montgomery Block, San Francisco.

Cordillera Gold and Silver Mining Company—Location of property, Morelos Mining District, Chihuahua, Mexico.

NOTICE.—There are delinquent upon the following described stock, on account of assessment levied on the 21st day of December, 1872, the several amounts set opposite the names of the respective shareholders, as follows:

Names.	No. Certificate.	No. Shares.	Amount.
C. A. Hall.....	251	32	\$4 80
W. R. Cooper.....	50	52	7 80
James Walsh.....	100	13	1 95
G. B. Andrews.....	102	5	75
G. B. Andrews.....	104	5	75
C. A. Hall.....	260	20	3 00
H. L. A. Goch.....	350	25	3 75
L. Frankl (not issued).....		853	129 75
Alfred Harris.....	137	5	75
Alfred Harris.....	148	8	1 20
P. M. Kelly.....	190	2	45
P. M. Kelly.....	125	3	30
W. N. Wade.....	222	50	7 50
W. N. Wade.....	233	100	15 00
C. W. McLean.....	230	100	15 00

And in accordance with law, and an order of the Board of Trustees, made on the 21st day of December, 1872, so many shares of each parcel of said stock as may be necessary will be sold at public auction, at the office of said Company, 321 Washington street, on Monday, the 10th day of February, 1873, at the hour of 2 o'clock P. M. of said day, to pay said delinquent assessment thereon, together with costs of advertising and expenses of sale.

H. H. REED, Secretary. Office, 321 Washington street, San Francisco, Cal. ja25-3t

Eagle Quicksilver Mining Company—Location

of works, Santa Barbara County, California. Notice is hereby given, that at a meeting of the Board of Trustees of said Company, held on the 15th day of January, 1873, an assessment of \$10 per share was levied upon the capital stock of said Company, payable immediately, in gold coin of the United States, to the Secretary of the company, Room 5 and 6, No. 302 Montgomery street, San Francisco, California. Any shares upon which said assessment shall remain unpaid on Wednesday, March 19th, 1873, shall be deemed delinquent, and will be duly advertised on Saturday, March 22d, 1873, for sale at public auction, and unless payment shall be made before, will be sold on Monday, the 24th day of March, 1873, to pay the delinquent assessment, together with costs of advertising and expenses of sale. WM. H. WATSON, Secretary. Office, Room 5 and 6, No. 302 Montgomery street, San Francisco, Cal. ja25

Gold Run Mining Company—Location

of works, Nevada County, Cal. Notice is hereby given, that at a meeting of the Board of Trustees of said company, held on the 30th day of December, 1872, an assessment of ten (10) cents per share was levied upon the capital stock of said company, payable immediately in United States gold coin, to the Secretary, at his office, corner of Market and Spear streets, San Francisco. Any stock upon which said assessment shall remain unpaid on Tuesday, February 4th, 1873, shall be deemed delinquent, and will be duly advertised for sale at public auction, and unless payment shall be made before, will be sold on Tuesday, February 25th, 1873, to pay the delinquent assessment, together with costs of advertising and expenses of sale. C. C. PALMER, Secretary. Office, corner Market and Spear streets, S. F. ja24

A Special Meeting of the Stockholders

of the Gold Run Mining Co., for the election of a new Board of Trustees, and for the transaction of such other business as may properly come before the meeting, will be held at the office of the Secretary, corner of Market and Spear streets, on Tuesday, February 4th, at 12 o'clock M. By order of the Board of Trustees. C. C. PALMER, Secretary. ja24

Mocking Bird Mining Company—Location

of works, Ely-Mining District, Lincoln County, State of Nevada. NOTICE.—There are delinquent upon the following described stock, on account of assessment levied on the 5th day of December, 1872, the several amounts set opposite the names of the respective shareholders, as follows:

Names.	No. Certificate.	No. Shares.	Amount.
Bradford, P. F., Trustee.....	4	100	\$10 00
Neal, Chas S., Trustee.....	15	10	1 00
Neal, Chas S., Trustee.....	15	20	2 00
Neal, Chas S., Trustee.....	21	20	2 00
Neal, Chas S., Trustee.....	25	50	5 00
Neal, Chas S., Trustee.....	26	50	5 00
Neal, Chas S., Trustee.....	29	50	5 00
Neal, Chas S., Trustee.....	31	50	5 00
Neal, Chas S., Trustee.....	35	50	5 00
Neal, Chas S., Trustee.....	39	100	10 00
Neal, Chas S., Trustee.....	40	100	10 00
Neal, Chas S., Trustee.....	43	100	10 00
Neal, Chas S., Trustee.....	48	100	10 00
Neal, Chas S., Trustee.....	54	100	10 00
Ricketts, A. H., Trustee.....	78	50	5 00
Ricketts, A. H., Trustee.....	81	100	10 00
Ricketts, A. H., Trustee.....	85	100	10 00
Ricketts, A. H., Trustee.....	88	100	10 00
Ricketts, A. H., Trustee.....	173	20	2 00
Ricketts, A. H., Trustee.....	175	20	2 00
Ricketts, A. H., Trustee.....	182	20	2 00
Ricketts, A. H., Trustee.....	191	100	1 00
Ricketts, A. H., Trustee.....	194	10	1 00
Ricketts, A. H., Trustee.....	198	10	1 00
Ricketts, A. H., Trustee.....	200	10	1 00
Thomas, D. L., Trustee.....	350	1000	100 00
Thomas, D. L., Trustee.....	351	1000	100 00
Thomas, D. L., Trustee.....	352	1000	100 00
Thomas, D. L., Trustee.....	354	1575	157 50
Thomas, D. L., Trustee.....	355	1300	130 00
Thomas, D. L., Trustee.....	357	2500	250 00
Thomas, D. L., Trustee.....	358	2425	242 50
Thomas, D. L., Trustee.....	359	1400	140 00
Thomas, D. L., Trustee.....	360	1000	100 00
Verdall, E. F., Trustee.....	5	100	10 00

And in accordance with law, and an order of the Board of Trustees, made on the 5th day of December, 1872, so many shares of each parcel of said stock as may be necessary, will be sold at public auction, at the office of the Company, room 21, Hayward's Building, No. 419 California street, San Francisco, Cal., on the 5th day of January, 1873, at the hour of 1 o'clock P. M. of said day, to pay said delinquent assessment thereon, together with costs of advertising and expenses of sale. H. C. KIBBE, Secretary. Office, Room 21, Hayward's Building, 419 California street, San Francisco, California. ja18

Ivanhoe Silver Mining Company—Location

of works, Ely District, Lincoln County, Nevada.
 Notice—There are delinquent upon the following described stock, on account of assessment levied on the 1st day of December, 1872, the several amounts set opposite the names of the respective shareholders, as follows:

Names.	No. Certificate.	No. Shares.	Amount.
E. A. Richardson, Trustee.....	2	100	\$100.00
E. A. Richardson, Trustee.....	3	100	100.00
E. A. Richardson, Trustee.....	4	100	100.00
E. A. Richardson, Trustee.....	5	100	100.00
E. A. Richardson, Trustee.....	6	100	100.00
E. A. Richardson, Trustee.....	7	100	100.00
E. A. Richardson, Trustee.....	8	100	100.00
E. A. Richardson, Trustee.....	9	100	100.00
E. A. Richardson, Trustee.....	10	100	100.00
E. A. Richardson, Trustee.....	11	100	100.00
E. A. Richardson, Trustee.....	12	100	100.00
E. A. Richardson, Trustee.....	13	100	100.00
E. A. Richardson, Trustee.....	14	100	100.00
E. A. Richardson, Trustee.....	15	100	100.00
E. A. Richardson, Trustee.....	16	100	100.00
E. A. Richardson, Trustee.....	17	100	100.00
E. A. Richardson, Trustee.....	18	100	100.00
E. A. Richardson, Trustee.....	19	100	100.00
E. A. Richardson, Trustee.....	20	100	100.00
E. A. Richardson, Trustee.....	21	100	100.00
E. A. Richardson, Trustee.....	22	100	100.00
E. A. Richardson, Trustee.....	23	100	100.00
E. A. Richardson, Trustee.....	24	100	100.00
E. A. Richardson, Trustee.....	25	100	100.00
E. A. Richardson, Trustee.....	26	100	100.00
E. A. Richardson, Trustee.....	27	100	100.00
E. A. Richardson, Trustee.....	28	100	100.00
E. A. Richardson, Trustee.....	29	100	100.00
E. A. Richardson, Trustee.....	30	100	100.00
E. A. Richardson, Trustee.....	31	100	100.00
E. A. Richardson, Trustee.....	32	100	100.00
E. A. Richardson, Trustee.....	33	100	100.00
E. A. Richardson, Trustee.....	34	100	100.00
E. A. Richardson, Trustee.....	35	100	100.00
E. A. Richardson, Trustee.....	36	100	100.00
E. A. Richardson, Trustee.....	37	100	100.00
E. A. Richardson, Trustee.....	38	100	100.00
E. A. Richardson, Trustee.....	39	100	100.00
E. A. Richardson, Trustee.....	40	100	100.00
E. A. Richardson, Trustee.....	41	100	100.00
E. A. Richardson, Trustee.....	42	100	100.00
E. A. Richardson, Trustee.....	43	100	100.00
E. A. Richardson, Trustee.....	44	100	100.00
E. A. Richardson, Trustee.....	45	100	100.00
E. A. Richardson, Trustee.....	46	100	100.00
E. A. Richardson, Trustee.....	47	100	100.00
E. A. Richardson, Trustee.....	48	100	100.00
E. A. Richardson, Trustee.....	49	100	100.00
E. A. Richardson, Trustee.....	50	100	100.00
E. A. Richardson, Trustee.....	51	100	100.00
E. A. Richardson, Trustee.....	52	100	100.00
E. A. Richardson, Trustee.....	53	100	100.00
E. A. Richardson, Trustee.....	54	100	100.00
E. A. Richardson, Trustee.....	55	100	100.00
E. A. Richardson, Trustee.....	56	100	100.00
E. A. Richardson, Trustee.....	57	100	100.00
E. A. Richardson, Trustee.....	58	100	100.00
E. A. Richardson, Trustee.....	59	100	100.00
E. A. Richardson, Trustee.....	60	100	100.00
E. A. Richardson, Trustee.....	61	100	100.00
E. A. Richardson, Trustee.....	62	100	100.00
E. A. Richardson, Trustee.....	63	100	100.00
E. A. Richardson, Trustee.....	64	100	100.00
E. A. Richardson, Trustee.....	65	100	100.00
E. A. Richardson, Trustee.....	66	100	100.00
E. A. Richardson, Trustee.....	67	100	100.00
E. A. Richardson, Trustee.....	68	100	100.00
E. A. Richardson, Trustee.....	69	100	100.00
E. A. Richardson, Trustee.....	70	100	100.00
E. A. Richardson, Trustee.....	71	100	100.00
E. A. Richardson, Trustee.....	72	100	100.00
E. A. Richardson, Trustee.....	73	100	100.00
E. A. Richardson, Trustee.....	74	100	100.00
E. A. Richardson, Trustee.....	75	100	100.00
E. A. Richardson, Trustee.....	76	100	100.00
E. A. Richardson, Trustee.....	77	100	100.00
E. A. Richardson, Trustee.....	78	100	100.00
E. A. Richardson, Trustee.....	79	100	100.00
E. A. Richardson, Trustee.....	80	100	100.00
E. A. Richardson, Trustee.....	81	100	100.00
E. A. Richardson, Trustee.....	82	100	100.00
E. A. Richardson, Trustee.....	83	100	100.00
E. A. Richardson, Trustee.....	84	100	100.00
E. A. Richardson, Trustee.....	85	100	100.00
E. A. Richardson, Trustee.....	86	100	100.00
E. A. Richardson, Trustee.....	87	100	100.00
E. A. Richardson, Trustee.....	88	100	100.00
E. A. Richardson, Trustee.....	89	100	100.00
E. A. Richardson, Trustee.....	90	100	100.00
E. A. Richardson, Trustee.....	91	100	100.00
E. A. Richardson, Trustee.....	92	100	100.00
E. A. Richardson, Trustee.....	93	100	100.00
E. A. Richardson, Trustee.....	94	100	100.00
E. A. Richardson, Trustee.....	95	100	100.00
E. A. Richardson, Trustee.....	96	100	100.00
E. A. Richardson, Trustee.....	97	100	100.00
E. A. Richardson, Trustee.....	98	100	100.00
E. A. Richardson, Trustee.....	99	100	100.00
E. A. Richardson, Trustee.....	100	100	100.00

Mount Jefferson Milling and Mining Company—Location

of works, First Garoto, Trolimne County, California.
 Notice—There are delinquent upon the following described stock, on account of assessment levied on the 18th day of December, 1872, the several amounts set opposite the names of the respective shareholders as follows:

Names.	No. Certificate.	No. Shares.	Amount.
Boswell, S. B., Trustee.....	47	1000	\$150.00
Deane, Coll., Trustee.....	55	50	7.50
O'Calloway, W. T., Trustee.....	50	150	22.50
Lewis, L. J., Trustee.....	6	500	75.00
Lewis, L. J., Trustee.....	8	500	75.00
Lewis, L. J., Trustee.....	48	100	15.00
Lewis, L. J., Trustee.....	54	50	7.50
Lewis, L. J., Trustee.....	60	100	15.00
Lewis, L. J., Trustee.....	96	100	15.00
Lewis, L. J., Trustee.....	100	100	15.00
Richardson, E. A., Trustee.....	17	1580	237.00
Richardson, E. A., Trustee.....	32	200	30.00
Richardson, E. A., Trustee.....	33	100	15.00
Richardson, E. A., Trustee.....	37	100	15.00
Richardson, E. A., Trustee.....	71	100	15.00
Richardson, E. A., Trustee.....	73	100	15.00
Richardson, E. A., Trustee.....	77	100	15.00
Richardson, E. A., Trustee.....	81	100	15.00
Richardson, E. A., Trustee.....	84	200	30.00
Richardson, E. A., Trustee.....	90	50	7.50
Richardson, E. A., Trustee.....	107	300	45.00
Richardson, E. A., Trustee.....	112	100	15.00
Richardson, E. A., Trustee.....	113	100	15.00
Simmons, Wm., Trustee.....	100	190	28.50
Simmons, Wm., Trustee.....	101	10	1.50
White, U. H., Trustee.....	101	100	15.00
White, U. H., Trustee.....	114	100	15.00
White, U. H., Trustee.....	115	100	15.00

And in accordance with law, and an order of the Board of Directors, made on the 18th day of December, 1872, so many shares of each parcel of said stock as may be necessary, will be sold at public auction, at the office of the Company, at the 4th of California street, San Francisco, Cal., on the 17th day of February, 1873, at the hour of 2 o'clock P. M. of said day, to pay said delinquent assessment thereon, together with costs of advertising and expenses of sale.

DANIEL BUCK, Secretary.
 Office, 14 Stevenson Building, No. 331 Montgomery street, San Francisco, Cal.

Meadow Valley East Extension M. Co.—

Location of works, Ely Mining District, Nevada.
 Notice is hereby given that at a meeting of the Board of Trustees of said Company, held on the 15th day of January, 1873, an assessment of ten cents per share was levied upon the capital stock of said Company, payable immediately in United States gold and silver coin, to the Secretary, at the office of the Company, Room 3, No. 419 California street, San Francisco, Cal. Any stock upon which said assessment shall remain unpaid on the 24th day of February, 1873, shall be deemed delinquent, and will be duly advertised for sale at public auction, and unless payment shall be made before, will be sold on Friday, the 21st day of March, 1873, to pay the delinquent assessment, together with costs of advertising and expenses of sale. By order of the Board of Trustees, T. W. COLBURN, Secretary.

Mohave Consolidated Gold and Silver Mining Co., Location of works, Wallapai Mining District, Mohave County, Territory of Arizona.

Notice is hereby given that at a meeting of the Board of Trustees of said Company, held on the 7th day of January, 1873, an assessment of ten cents per share was levied upon the capital stock of said Company, payable immediately in United States gold and silver coin, to the Secretary, at the office of the Company. Any stock upon which said assessment shall remain unpaid on the 24th day of February, 1873, shall be deemed delinquent, and will be duly advertised for sale at public auction, and unless payment shall be made before, will be sold on the 3rd day of March, 1873, to pay the delinquent assessment, together with costs of advertising and expenses of sale. By order of the Board of Trustees, T. E. JEWELL, Secretary.

The Metropolitan Gas Company—Location

of works, San Francisco, in the County of San Francisco, State of California.
 Notice is hereby given that at a meeting of the Trustees of said Company, held on the 15th day of January, 1873, an assessment of Five (5) Dollars per share, gold coin, was levied upon the capital stock of said Company, payable on or before the 21st day of February, 1873, to the Secretary, at the office of said Company, No. 301 Pine street, San Francisco, Cal. Any stock upon which said assessment shall remain unpaid on the 21st day of February, 1873, shall be deemed delinquent, and will be duly advertised for sale at public auction, and unless payment shall be made before, will be sold on Saturday, the 15th day of March, 1873, to pay the delinquent assessment, together with costs of advertising and expenses of sale. By order of the Board of Trustees, A. D. BELL, Secretary.

Noonday Silver Mining Company—Location

of works, White Pine District, Nevada.
 Notice is hereby given that at a meeting of the Board of Trustees of said Company, held on the 14th day of January, 1873, an assessment of No. 15 of Twenty Cents per share was levied upon the capital stock of said Company, payable immediately in United States gold coin, to the Secretary, at the office of the Company, No. 26 Hayward's Building, California street, San Francisco, California. Any stock upon which said assessment shall remain unpaid on the 24th day of February, 1873, shall be deemed delinquent, and will be duly advertised for sale at public auction, and unless payment shall be made before, will be sold on Monday, the 17th day of March, 1873, to pay the delinquent assessment, together with costs of advertising and expenses of sale. By order of the Board of Trustees, J. M. BUEFINGTON, Secretary.

Ophir Copper, Silver and Gold Mining Company—Location of works, Ophir, Placer County, California.

Notice—There are delinquent upon the following described stock, on account of assessment levied on the 19th day of December, 1872, the several amounts set opposite the names of the respective shareholders as follows:

Names.	No. Certificate.	No. Shares.	Amount.
Mrs. E. Brandt.....	315	50	\$15.00
Richard Speyer.....	309	24 3/4	7.35
H. C. Swain.....	318	50	15.00
W. J. Kip, Jr., Trustee.....	8	500	60.00
W. J. Kip, Jr., Trustee.....	9	500	60.00
W. J. Kip, Jr., Trustee.....	10	500	60.00
Geo. P. Rogers, Trustee.....	12	75	7.50
Chas. F. Brown, Trustee.....	21	880	88.00
James R. Garmis, Trustee.....	26	300	30.00
W. C. Brush, Trustee.....	27	1000	100.00
Wallace Everson, Trustee.....	29	600	60.00
H. C. Swain, Trustee.....	31	500	50.00
H. C. Swain, Trustee.....	32	500	50.00
H. C. Swain, Trustee.....	33	302	30.20
Mrs. Emma Brandt.....	34	150	15.00
Mrs. Emma Brandt.....	35	150	15.00

And in accordance with law and an order of the Board of Directors, made on the 19th day of December, 1872, so many shares of each parcel of said stock as may be necessary, will be sold at public auction at the office of the Company, room 2, Express Building, 402 Montgomery street, San Francisco, California, on the 17th day of February, 1873, at the hour of one o'clock P. M. of said day, to pay said delinquent assessment thereon, together with costs of advertising and expenses of sale.

O. H. BOGART, Secretary.
 Office, room 2, Express Building, 402 Montgomery street, San Francisco, California.

Quail Hill Mining and Water Company—

Location of works, Calaveras County, State of California.

Notice—There are delinquent upon the following described stock, on account of assessment levied on the 4th day of December, 1872, the several amounts set opposite the names of the respective shareholders as follows:

Names.	No. Certificate.	No. Shares.	Amount.
W. H. Sharp.....	43	1	\$10.00
E. F. Dennison.....	42	1	10.00
E. A. Richardson, Trustee.....	45	60	500.00
F. S. Spring, Trustee.....	45	90	900.00
F. S. Spring, Trustee.....	47	30	300.00
Geo. C. Sharp, Trustee.....	40	1000	1000.00
S. C. Stobbs.....	41	1	10.00
P. N. Lilliant, Trustee.....	50	127	1270.00

And in accordance with law, and an order of the Board of Trustees, made on the 4th day of December, 1872, so many shares of each parcel of said stock as may be necessary, will be sold at public auction, at the office of the Company, No. 438 California street, San Francisco, California, on the 4th day of February, 1873, at the hour of 2 o'clock P. M. of said day, to pay said delinquent assessment thereon, together with costs of advertising and expenses of sale.

T. F. CRONISE, Secretary.
 Office, 438 California street, San Francisco, Cal.

Rail Road Consolidated Mining Company—

Location of works, Railroad District, Elko County, State of Nevada.

Notice is hereby given that at a meeting of the Board of Trustees of said Company, held on the 7th day of January, 1873, an assessment of fifteen (15) cents per share was levied upon the capital stock of said Company, payable immediately in United States gold and silver coin, to the Secretary, at the office of the Company, No. 328 Montgomery street, Room No. 10. Any stock upon which said assessment shall remain unpaid on the 18th day of February, 1873, shall be deemed delinquent, and will be duly advertised for sale at public auction, and unless payment shall be made before, will be sold on Thursday, the 28th day of March, 1873, to pay the delinquent assessment, together with costs of advertising and expenses of sale. By order of the Board of Trustees, JOSEPH P. NOUSE, Secretary.

Sanderson Gold Mining Company—Location

of works, Railroad Flat, Calaveras County, California.
 Notice is hereby given that at a meeting of the Board of Trustees of said Company, held on the 7th day of January, 1873, an assessment of No. 2 of ten cents per share, was levied upon the capital stock of said Company, payable immediately in United States gold coin, to the Secretary, at the office of the Company, Room 3, No. 419 California street, San Francisco, Cal. Any stock upon which said assessment shall remain unpaid on the 24th day of February, 1873, shall be deemed delinquent, and will be duly advertised for sale at public auction, and unless payment shall be made before, will be sold on Monday, the 24th day of February, A. D. 1873, at the office of said Company, to pay the delinquent assessment thereon, together with costs of advertising and expenses of sale. By order of the Board of Trustees, WILLIAM STUART, Secretary.

Spring Mountain Tunnel Company—Location

of works, Lincoln County, Nevada.
 Notice—There are delinquent upon the following described stock, on account of assessment (No. 4) levied on the 17th day of December, 1872, the several amounts set opposite the names of the respective shareholders as follows:

Names.	No. Certificate.	No. Shares.	Amount.
F. A. Munroe.....	31	25	\$ 5.00
Ann O'Neill.....	32	1333	5 250.00
Jan T. Dean.....	92	1000	200.00
Jan T. Dean.....	126	180	36.00
David Leahy.....	132	1233	246.60
F. M. Fennell.....	109	5	1.00
F. M. Fennell.....	110	5	1.00
F. M. Fennell.....	186	25	5.00
C. F. Webster, Trustee.....	190	100	20.00
J. M. Bullington, Trustee.....	78	50	10.00
J. M. Bullington, Trustee.....	136	50	10.00
J. M. Bullington, Trustee.....	194	250	50.00
J. M. Bullington, Trustee.....	249	50	10.00
J. M. Bullington, Trustee.....	253	50	10.00
Geo. H. Hallett, Trustee.....	108	5	1.00
Geo. H. Hallett, Trustee.....	107	5	1.00
M. C. Houghton.....	141	20	4.00
W. M. Worcester.....	165	100	20.00
W. M. Worcester.....	188	100	20.00
W. T. James.....	173	30	6.00
Henry Bruer, Trustee.....	174	10	2.00
F. M. Gunn, Trustee.....	181	15	3.00
B. M. Gunn, Trustee.....	184	100	20.00
R. S. Talbert.....	231	15	3.00
R. S. Talbert.....	232	10	2.00
J. H. Marston.....	233	130	26.00
Samuel Ed. Rd.....	248	100	20.00
J. T. Pomeroy, Trustee.....	286	100	20.00

And in accordance with law and an order of the Board of Directors, made on the 17th day of December, 1872, so many shares of each parcel of such stock as may be necessary, will be sold at public auction, at the office of the Company, room 37, new Merchants' Exchange, California street, San Francisco, California, on Monday, the 17th day of February, 1873, at the hour of 12 o'clock P. M. of said day, to pay said delinquent assessment thereon, together with costs of advertising and expenses of sale.

J. M. BUEFINGTON, Secretary.
 Office, 37 New Merchants' Exchange, California street, San Francisco, California.

Spring Mount Mining Company—Location

of works, Ely Mining District, Nevada.
 Notice is hereby given that at a meeting of the Board of Trustees of said Company, held on the 15th day of January, 1873, an assessment of twenty-five cents per share was levied upon the capital stock of said Company, payable immediately in United States gold and silver coin, to the Secretary, at the office of the Company, Room 3, No. 419 California street, San Francisco, Cal. Any stock upon which said assessment shall remain unpaid on Tuesday, February 26th, 1873, shall be deemed delinquent, and will be duly advertised for sale at public auction, and unless payment shall be made before, will be sold on Friday, March 21st, 1873, to pay the delinquent assessment, together with costs of advertising and expenses of sale. By order of the Board of Trustees, T. W. COLBURN, Secretary.

Stanford Silver Mining Company—Location

of works, Sierra District, Humboldt County, State of Nevada.

Notice is hereby given that at a meeting of the Board of Trustees of said Company, held on the 3rd day of January, A. D. 1873, an assessment of twenty-five cents per share was levied upon the capital stock of said Company, payable immediately in United States gold coin, to the Secretary, at the office of the Company, Room 36, Hayward's Building, California street, San Francisco, California. Any stock upon which said assessment shall remain unpaid on Saturday, February 8th, 1873, shall be deemed delinquent, and will be duly advertised for sale at public auction, and unless payment shall be made before, will be sold on Monday, the 3rd day of March, A. D. 1873, to pay the delinquent assessment, together with costs of advertising and expenses of sale. By order of the Board of Trustees, T. W. COLBURN, Secretary.

State of Maine Mill and Mining Company—

Location of works

Our Machine Builders.

ESTABLISHED 1851.

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First and Fremont streets,

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Mining Machinery of Every Description,

And all other classes of work generally done at first-class establishments, manufactured by us at the lowest prices, and of the best quality.

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Quartz, Flour and Saw Mills,

Improved Steam Pump, Brodie's Improved Crusher, Mining Pumps, Amalgamators, and all kinds of Machinery.

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STEAM ENGINES,

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Improved Safety Store Hoists,

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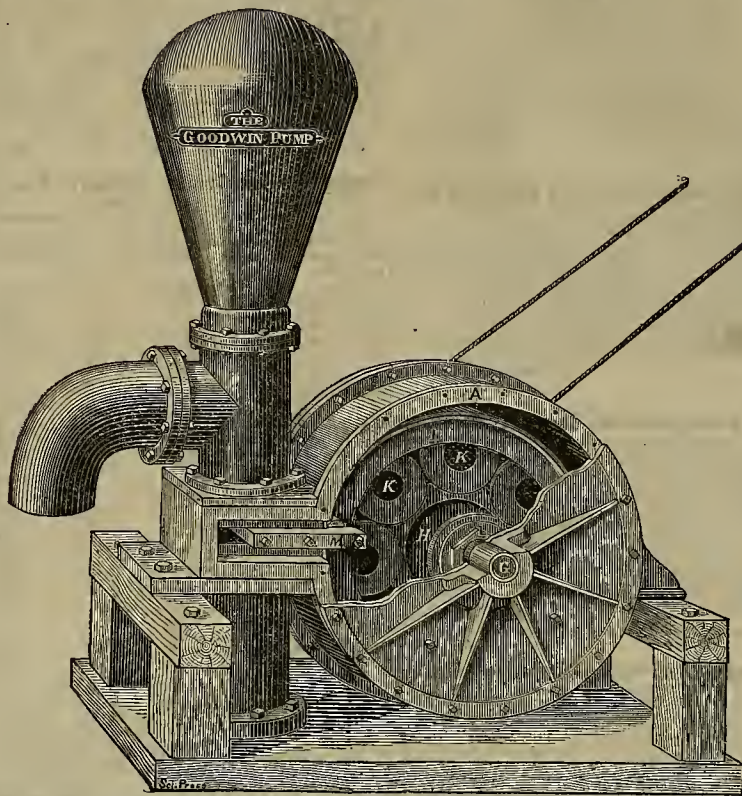
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Of every description and size.

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It is Unsurpassed for Hydraulic Mining.

And will throw a stream of from two to six hundred inches of water with a force equal to a fall of two hundred and fifty feet. It is peculiarly adapted to windmills for irrigating, or domestic purposes, and is equally as efficient and noiseless at a high or low speed, the water raised being in the ratio of its revolutions. Our large irrigating Pumps will throw twenty thousand gallons per minute.

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24v17-37

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22v25-3m

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22-v23-4f

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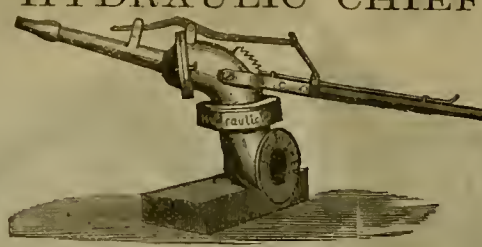
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10v19-1g

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Risdon Iron and Locomotive Works
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Standard sizes of railroad Car Wheels, with special patterns for Mining Cars. These small wheels are made of the best Car Wheel Iron, properly chilled, and can be fitted up with the improved axle and box—introduced by this company, and guaranteed to outlast any other wheels made in this State.
All kinds of Machinery made and repaired.
24v22-3m **JOSEPH MOORE,** Superintendent.

J. M. STOCKMAN,
Manufacturer of
PATTERNS AND MODELS,
(Over W. T. Garratt's Brass Foundry).
N. W. corner Natoma and Fremont streets, S. F. Entrance on Natoma street.
6v23-3m
JOS. THORNHILL,
1612 Mason Street, near Green.
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JOS. THORNHILL,
Bricklayer and Contractor
Particular attention paid to all kinds of **FIRE WORK**, such as **BOILERS, FURNACES, OVENS, GRATES, RANGES,** etc.

FISHER'S KNUCKLE JOINT AND NOZZLE
IS THE
Cheapest and Best Hydraulic Machine in use.
The only reliable party in the Hydraulic business who protects his patrons.
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9v23-1f



MACHINES
Manufactured
TO ORDER,
to throw from
One
to an
eight-inch
STREAM.

HYDRAULIC MINERS, TAKE NOTICE—I hereby caution Miners and Manufacturers against making, buying, selling or using a Hydraulic Machine or Joint known as the Little Giant, manufactured and sold by R. R. & J. Craig and Richard Hoskin, as the same is an infringement upon the invention of the machine known as **FISHER'S HYDRAULIC CHIEF**, secured by Letters Patent, No. 110,222, dated Dec. 20, 1870. All parties participating in such infringements will be rigorously prosecuted. Nevada, Jan. 13th.
F. H. FISHER.

THE LIGHTNING MILL.
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For Pulverizing Quartz,
"Charleston Rock," and all Native Phosphates, Flint, Feldspar, Iron Ore, Manganeso, Anthomy, Carbon, Cornum, Old Cimbles, Barytes, Brimstone, Slate, Soapstone, Graphite, Glass, Marble, Plaster, Anthracite and Bituminous Coals, etc.
WM. STEWART'S
Patent Bone Mills and Crushers.
For Grinding Bones, Rock, Quartz, and all hard substances; also, Corn, Wheat, Oats, Barley, Coffee, Spices, etc.
WALKER BROS. & CO., Twenty-third and Wood Streets, Philadelphia. Sole Manufacturers of Stewart's Celebrated Patent Bone Mills and Crushers, A. W. Stranb & Co.'s Patent Revolution French Burr Mill and A. Duval's Patent Centrifugal Pumps.



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MINING STEAM PUMPS.
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123 and 125 Beale Street.....SAN FRANCISCO.
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(Late Foreman of the Vulcan Iron Works,) Proprietor.



High and Low Pressure Boilers of all Descriptions.
SOLE MANUFACTURERS OF THE CELEBRATED SPIRAL BOILER.
SHEET IRON WORK of every description done at the Shortest Notice.
All kinds of **JOBING** and **REPAIRING** promptly attended to.
17v25-3m
From the Mining Summary in the Gold Hill News of December 28th.
The New Root Boiler
IS A PERFECT SUCCESS.
The saving in the amount of fuel consumed, alone amounting to 30 per cent. less than the cost of running the same machinery with the old style of Boilers.
For price list and prompt execution of orders please address
WM. HOLDREDGE,
137 Montgomery street, San Francisco,
General Agent for the Pacific Coast.
2v26-3m

SAN FRANCISCO
SCREW BOLT WORKS,
PHELPS BROTHERS, Proprietors
MANUFACTURERS OF ALL KINDS OF
Machine Bolts, Bridge Bolts, and Ship or Band Bolts.
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MOYNIHAN & AITKEN,
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OF ALL KINDS,
Built according to Drawings or Specifications, and **SHEET IRON WORK** executed at the shortest notice, and on the most reasonable terms.
Repairing promptly attended to, and at reasonable rates.
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4v26-3m

Steam Boiler Manufactory
—OF—
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(Successor to D. McDonald.)
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ALL SORTS OF STEAM BOILERS
Made to order and repaired.
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25v25-3m

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BOILER MAKERS
AND GENERAL MACHINISTS,
Howard st., between Fremont and Beale, San Francisco.
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Tinware, and all kinds of Kitchen Utensils, Metal Roofing, Tin, Copper, and Sheet-iron work. Chimney Tops put up, and warranted. 724 Market street, S. F.

Sketch of Delaney's New Patent Cushion.



DESCRIPTION OF ENGRAVING.
E, pin or regulator, extending into rail; D, steel wire, tending from pin into and through rubber cushion; B, rubber cushion; C, end of rubber cushion; A, lining.
Their construction is of the simplest kind, thus making no heavy expense for suppositious elaboration. The improvement is a steel wire running lengthwise, and communicating with a pin at each end and inside of the rail; the wire is imbedded in the rubber cushion, near its edge or surface. The pin mentioned is controlled and operated upon by a key, regulating the tension of the wire, according to the necessities of the case. It keeps the edge of the cushion straight and sharp. It prevents the rubber hardening from the impingement of the ball; and, above all other considerations, the angles are bound to be perfectly correct.
The ball never jumps from the table, however severe the stroke. It makes no noise when leaving the cushion.
Nine cushions are made upon our tables with the same degree of force requisite to make six upon any other.
These unrivalled cushions are self-protective, and will retain their elasticity either in hot, cold, dry, or damp weather, almost forever.
Thousands of Delaney's cushions have been introduced throughout California and the Great West, where the largest billiard manufacturers now make exclusive use of them, to the eminent satisfaction of their patrons.
Sole Agents for the Pacific States, China, Japan, Sandwich Islands, and Australia.
JACOB STRAHLE & CO.,
533 Market Street, opposite Sansome and Sutter. 2m

The California Powder Works
No. 314 CALIFORNIA STREET,
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Manufacturers and have constantly on hand
SPORTING,
MINING,
And **BLASTING**
POWDER,
OF SUPERIOR QUALITY, FRESH FROM THE MILLS. It being constantly received and transported into the interior, is delivered to the consumer within a few days of the time of its manufacture, and is in every way superior to any other Powder in Market.
We have been awarded successively
Three Gold Medals
By the **MECHANICS' INSTITUTE** and the **STATE AGRICULTURAL SOCIETY** for the superiority of our products over all others.
We also call attention to our
HERCULES POWDER.
Which combines all the force of other strong explosive now in use, and the lifting force of the **BEST BLASTING POWDER**, thus making it vastly superior to any other compound now in use.
A circular containing a full description of this Powder can be obtained on application to our Office.
16v20-3m **JOHN F. LOHSE,** Secretary.

BLACK DIAMOND FILE WORKS.



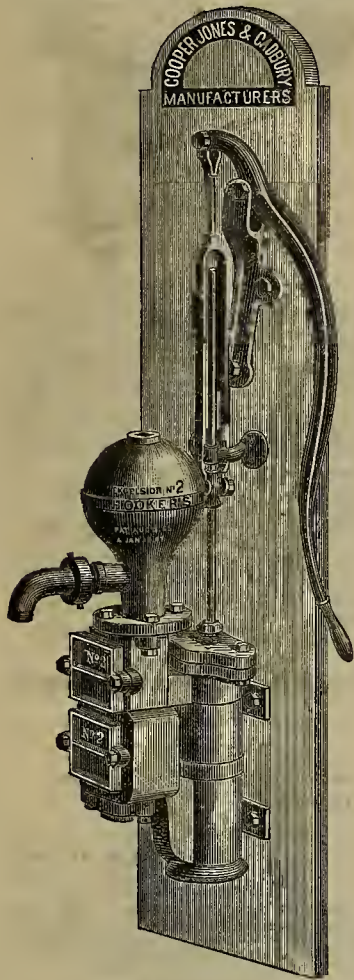
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Manufacturers of Files of every Description
Nos. 39, 41 and 43 Richmond street,
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MILL SAW FILES A SPECIALTY.
18v25-1y

California File Manuf'g Co.
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Manufacturers of New Files.
Old Files re-cut and warranted equal to new.
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at a saving of 50 per cent. Orders from the country promptly attended to.
9v19-by

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MANUFACTURER OF TOOLS
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Molding, Turning, Carving, Etc
Mortise Chisels, Blind Chisels, Crotchets
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for Stair Work and Sash Joints
on hand and made
to order.
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25v23-1f

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Wagon Maker and Blacksmith,
131 Beale St., between Mission and Howard,
SAN FRANCISCO.
Wagons, Trucks and Carts of every description manufactured to order on the shortest notice. Repairing of all kinds promptly attended to and all work guaranteed to give satisfaction.
4v28-3m

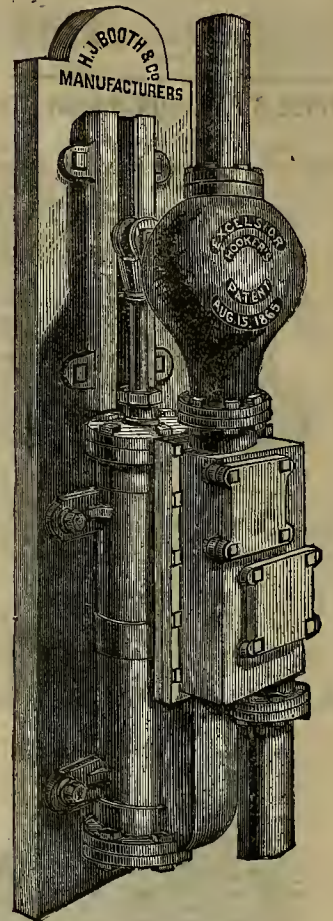
EXCELSIOR MINING PUMP.



NO. 2-MOUNTED.



NO. 3-SHIP.



NO. 5-MINING.

With six years use of this Pump we confidently recommend its

Use for Mining or Prospecting.

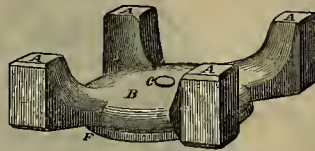
It is the **CHEAPEST** Pump in the market.

There is **NO** Trade Pump made of equal strength and power.

Every Pump is tested by hydraulic power to 125 lbs. to the square inch. So every Pump, large or small, is

WARRANTED

To Force Water 250 Feet High.



VALVE.

ALL PUMPS WARRANTED. All Expense of Transportation Refunded if the Pumps are Proved Defective.

Send for Circular.

Brittan, Holbrook & Co.,

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HALLIDIE'S
Patent Endless Wire Ropeway.
Covered by Numerous U. S. Patents.

IMPORTANT TO
Mining Companies, Civil Engineers, Contractors, Etc.

The system of transporting material, such as Ores, from the mine to the mill, Earths for embankments, Rock from quarries, etc., by means of steel wire rope, has been well tested and found more economical, advantageous and reliable than any other method of transportation; and to the annexed certificates in connection therewith I beg to call the attention of those interested:

EUREKA, Nevada, July 10, 1872.

T. M. MARTIN—My dear sir: On your leaving for San Francisco, it gives me great pleasure to hand you my written acceptance of the HALLIDIE TRAMWAY put up by you upon our mine in Freshburg.

It is a perfect success, discharging ten tons of ore per hour with two men's labor. It is perfectly simple in construction, and, as far as I can judge, there is nothing about it to ever get out of order—nothing to wear out. While others require but about two thousand five hundred feet of wire rope, I can see no reason why the line could not be extended almost indefinitely with equally happy results. Again, the carrying capacity might be doubled or quadrupled if desired. After several weeks trial upon our mine, the unanimous verdict of all who have seen it is a complete, unquestioned success. If this can be of any service to you, use it in any way you think proper. Very respectfully, C. C. GOODWIN.

EMMA HILL CONSOLIDATED MINING CO.,

Little Cottonwood, Utah.

T. M. MARTIN, Esq.—Sir: The Ropeway constructed by you (HALLIDIE'S PATENT) for the Emma Hill Consolidated Mining Company, has been built in a most substantial and workmanlike manner, and is at this time in splendid working condition. I most cheerfully accept the work for this Company, and recommend it to others wishing a sure and speedy transit for ores over places impracticable for wagon roads, etc. Respectfully,

L. W. COLBATH, Superintendent.

EMMA HILL CONSOLIDATED MINING CO.,

Superintendent's Office, Oct. 23, 1872.

T. M. MARTIN, Esq.—Sir: With pleasure I refer to the fact that the endless wire Ropeway (HALLIDIE'S PATENT) built by you for this Company, has been for a month or more in daily operation, and that it is in a most admirable manner, the machinery works smoothly and the cable is completely under the control of the brakes, man. In fine, the work in its operations is a success. Respec fully yours,

WM. C. CAMPBELL, Clerk of Co.

The Vallejo Ropeway.

The Vallejo Tunnel Company's Tramway in Little Cottonwood, built on the HALLIDIE PATENTED PLAN, is a complete success. It is between 2,500 and 2,400 feet in length, and is supported by thirteen stations. The fall in this distance is about 60 feet, and the wire rope, which is three-fourths of an inch in diameter, will safely and easily deliver one hundred tons in six hours. The machinery is automatic, loading and unloading the sacks or buckets. About one ton and a half can be sent down at one time. The stations are about two hundred feet apart, and the entire apparatus is strong and safe. As the wire rope is elevated about forty feet above the surface of the hill, the Tramway can be worked all winter long, without the slightest trouble.—Utah Mining Journal, Salt Lake, Sept. 23, 1872.

Mining Companies and others desiring to negotiate for the erection of this system of Ropeway, can communicate with me personally, or through Postoffice Box 964.

A. S. HALLIDIE, Patentee,

112 and 114 California Street, San Francisco.

Wire Rope for hoisting from mines, transmitting power, ship rigging, etc., of all kinds and sizes, on hand and made to order.

Wire of all kinds and descriptions, furnished at lowest rates.

A. S. HALLIDIE, 112 and 114 California St.

THE GIANT POWDER COMPANY

Are now manufacturing besides the famous regular

GIANT POWDER, A NO. 2 GIANT POWDER,

Somewhat slower in its Explosion, which we recommend for

BANK BLASTING, COAL MINES,

AND FOR ALL SUCH WORK WHERE THE ROCK IS NOT VERY HARD

It is fully as safe as the other and evolves neither smoke nor noxious fumes when exploded.

Price. 50 Cents per Pound.

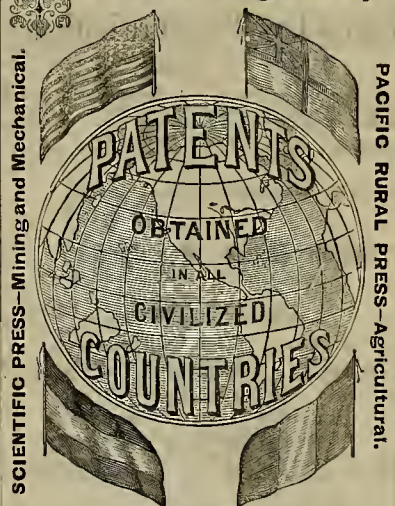
The sales of both grades increase very fast, which is the best proof of their superiority over other explosives.

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Low Water Alarms, Gauge Cocks, Glass Water Gauges, Cylinder Cups, Self-Oilers, Boiler Felting, Selden's, Tuck's, Hemp and Soapstone Packing, Stocks, Taps and Dies, Twist Drills, Drill, Lathe and Planer Chucks, Emery Wheels, Etc.

Every description of Engineers' and Machinists' supplies, for sale by
TREADWELL & CO., San Francisco.
2v26t

CAUTION.

Betts's Patent Capsules.
The public are respectfully cautioned that BETTS'S Patent Capsules are being infringed

BETTS'S name is upon every Capsule, he makes for the leading Merchants at home and abroad, and he is the ONLY INVENTOR and SOLE MAKER in the United Kingdom.

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CITY

Brass and Bell Founder,
Corner Natoma and Fremont Streets,
MANUFACTURERS OF

Brass, Zinc and Anti-Friction or Babbst Msta CASTINGS,

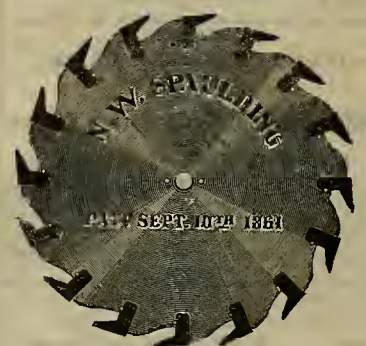
Church and Steamboat Bells,
TAVERN AND AND BELLS, GONGS,
FIRE ENGINES, FORCE and LIFT PUMPS.

Steam, Liquor, Soda, Oil, Water and Flange Cocks, and Valves of all descriptions, made and repaired. Hoses and all other Joints, Spelter, Solder and Copper Rivets, etc. Gauge Cocks, Cylinder Cocks, Oil Globes, Steam Whistles. HYDRAULIC PIPES AND NOZZLES for mining purposes. Iron Steam Pips furnished with Fittings, etc. Coupling Joints of all sizes. Particular attention paid to Distillery Work. Manufacturer of "Garratt's Patent Improved Journal Metal."

Highest Market Price paid for OLD BELLS, COPPER and BRASS.

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Saw Smithing and Repairing
ESTABLISHMENT.



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MANUFACTURER OF

SPAULDING'S

Patent Tooth Circular Saws.
They have proved to be the most durable and economical Saws in the World.

Each Saw is Warranted in every respect;
Particular attention paid to construction of
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MINING AND SCIENTIFIC PRESS.

An Illustrated Journal of Mining, Popular Science and Progressive Industry.

BY DEWEY & CO.,
Patent Solicitors.

SAN FRANCISCO, SATURDAY, FEBRUARY 8, 1873.

VOLUME XXVI.
Number 6.

The Chicago Taylor Printing Press Company.

The accompanying cut is a very good representation of the new and very superior steam printing machine we have recently put in operation in our printing establishment, and upon which all our issues will hereafter be printed. The improved appearance of our paper already accomplished speaks very plainly in favor of the superiority of this machine over all others now built in this country, and when it is better understood by those who operate it, and gets down to its bearings and work, this improvement will be more and more marked until we can give our readers a sheet which in mechanical execution is the peer of the best similar publication at the East.

As this is the first introduction here of this class of presses, made especially for extra fine engraving work, and our readers are to examine its work weekly, we take the privilege of indulging in a long talk concerning the machine and its builders. Every printer will be entirely interested in it, and the general reading public, we believe, benefitted by the facts we propose to set forth.

The heavy cost attending the purchase and starting such a machine as this is an important matter, and the absolute necessity having arisen of our procuring a machine of our own on which to print our own papers, made it necessary for us to examine into the merits of the various manufactures of printing presses at the East. After canvassing the matter very thoroughly, and consulting parties whose opinions in this particular is good evidence, and seeing other machines from the Chicago Taylor Printing Press Co., running in this city, we were forced to the conclusion that in all points of excellence this machine was not only the great favorite all over the Northwest and in the Territories, but indeed the best printing machine now built in this country.

In October last, the President of the Company, S. P. Rounds, Esq., of Chicago, visited this city and learning that we were on the point of putting up a new press volunteered to take the risk of sending a machine here—putting it up in our office, and guaranteeing it to operate to our entire satisfaction or no sale—and considering the heavy expense of the machine, the freight on it overland, and cost of putting it in operation, the heavy risk assumed by him at least proved his confidence in the press; and we are much pleased to add that he has not only fulfilled his contract to the letter, but that the machine operates even better than the guarantee, and that we are in every particular pleased with our choice and the purchase.

History of Press Building.

The history of the commencement and progress of the manufacture of the printing press in this country is a very interesting one, and had we the time and space to spare, would be pleased to give it in full, but as we have not, we will give only a brief synopsis. The first effort in this line was the "Ramago" two-pull band press, which was the only press in use up to about the year 1820, when the Stanhope press, invented by the Earl Stanhope, in England, was introduced into this country. This was soon followed by the "Ruthven," which had some improvements. In 1823 the first iron one-pull

EXPLANATIONS.—The pile of sheets to be printed will be seen on top of the press. They are fed down singly so as to be caught by the row of rollers shown across the upper and front portion of the large drum cylinder, the revolution of which carries the papers down to the flat type forms which latter pass horizontally back and forth on the bed of the press. The cylinder is adjusted so as to press the sheets sufficiently hard against the face of the types to take the impression of every letter. The forms are carried at each revolution so as to pass under the first set of inking rollers, seen just at the right of the drum cylinder. The ink is taken from the fountain at the extreme right of the engraving, and distributed evenly by the system of rollers arranged diagonally to each other, by the passage back and forth of a distributing plate. The sheets are delivered on the table at the left by the tapes and the fingers of the "fly," represented between the cylinder and the delivery table; 1,000 to 1,500 sheets per hour are printed on our press

press made by Wells, of Hartford, Conn., was brought out. At about the same time the "Smith" press, and shortly after the "Washington" press was brought out by R. Hoe & Co., of New York, and which press made both by Hoe and Taylor is the standard band press of to-day.

Up to 1820, no successful attempt had been made in perfecting a power press. In 1824 a Mr. Treadwell invented one, but it was imperfect. After a trip to Europe, and many experiments, the press was made to operate very well but was a crude affair. Sometime in 1824-5, the first "cylinder" or "Napier" press was imported from England for the joint use of the New York Daily American and the New York Daily Advertiser, the first an evening, and the latter a morning paper. Shortly after this Messrs. R. Hoe & Co., commenced the manufacture of cylinder presses in this country, which they have continued, father and sons to the present day—being jointly with A. B. Taylor, Esq., of New York, the "fathers" of the cylinder press in this country. We should have said that about this time the later justly celebrated

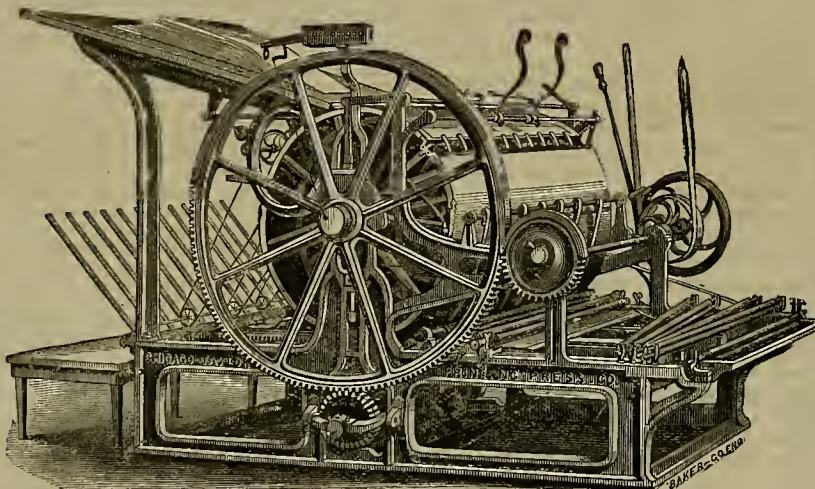
the very first, and at once took a leading rank in the press building interest.

The machines built by the new firm gave the most splendid satisfaction from the first, and in the short space of five years they have built hundreds of them, which from the best information we can gather, are every one giving the most hearty satisfaction, and running in the best offices in the Northwest, portions of the South and East, Colorado, Utah, Nevada, Oregon, and in our own city and State.

In 1869, just as the reputation and success of the new enterprise was triumphantly established, and his name and fame "written in letters of steel" in almost every office in the great West, Mr. Taylor died, but not until he had left well-educated successors to carry out his ideas and improvements. The business at this period was put into a company called the

"The Chicago Taylor Press Company,"

With the remaining partner as its President and head,



CHICAGO TAYLOR COMBINATION PRESS.

Adams' Book press was invented by Isaac Adams of Boston. At first it had a wooden frame and was a cumbersome and rather uncouth affair, very unlike the handsome and finely built machine of to-day.

At the time Messrs. R. Hoe & Co. began building the cylinder press, A. R. Taylor, Esq., of New York, was their foreman, and really constructed the first cylinder press ever made in this country. He continued in their employ for a term of years, when he started a manufactory for himself, and invented and added to the press then built by Hoe, many improvements, among them the celebrated air springs—a very desirable feature which has from that day to the present made the press a very popular one—so that the "Taylor" press is as well known to printers as its cotemporary, the "Hoe" and is in use in almost every large office from the Atlantic to the Pacific, very many of them having been in use from the early days of our own city to the present, in many of our city offices.

For some twelve years previous to 1867, Mr. Taylor's eldest son, George W. Taylor, who had received a thorough education in the best schools in this country and Europe, and a thorough mechanical one in his father's shops, and in them had acted as Superintendent and Draughtsman; falling in health from the raw sea winds, he conceived the idea of establishing a new manufactory of the Taylor press in Chicago. Accordingly in that year he moved thither and associated himself with S. P. Rounds, who had for twenty years transacted a general Printer's Furnishing Business in that city, and was well and widely known by the printing fraternity of the great North West.

George W. Taylor, was doubtless the most thoroughly accomplished Printing Press machinist and inventor this country ever saw. Young, ambitious, keenly alive to the necessity of keeping pace with the times in all improvements—listening to the suggestions of practical pressmen—and knowing full well the vital necessity of making an article which should combine all the excellence, improvements, and conveniences possible to attain, he at once made an entire new set of drawings and patterns—retaining all the excellencies of the old machine, and adding numerous new ones—aided by new and improved machinery, and also by the favorable acquaintance and practical business experience of his partner, the new firm met with the most flattering success from

and to whose great experience as a practical printer and pressman, dealer in printers' material and manufacturer of the presses, is the company indebted for its constant and unvarying success. A new and very large brick manufactory was erected—an entirely new and elegant and very extensive and expensive series of machinery put in operation, and the popularity and excellence of their machine is evidenced by the fact, that they have never as yet been able to keep up square with its orders, though often running double sets of hands, night and day, and we had to wait nearly three months before we could get our press built. However, we are assured by the President that by recent additions of men and machinery he hopes soon to be able to keep one press of each size and style on hand with which to meet urgent orders. The company is now building

Three Different Styles of Presses

And different sizes of each style. First, there is the so-called "Country" Drum Cylinder—a machine combining all the real excellencies of the more costly press, but not built so heavy or with as fine a finish, and made to run at a slower speed—say 1,000 to 1,500 per hour, by steam, and 800 to 1,000 hand—and afforded at a figure to meet the necessities of the "country" publisher, who cannot afford and does not require a faster press. No. 1, is 32x46 inches between bearers and is afforded at \$1,474, boxed and delivered on cars, and No. 2, 32x50 inches, at \$1,705, steam fixtures \$70 extra. This style of press is in general use in all the well-to-do offices in the Northwest and in Colorado, Utah, Nevada, Oregon, and in Napa, Santa Barbara and other places in this State. Next comes the "Combination," their

New and Latest Style,

And in cost between their "Country" and "Regular." This is the machine represented both in our office and in the accompanying engraving.

This press combines all the best features of the two other styles—has the combined rack and screw and table distribution—making it absolutely perfect, doing away with the intermediate wheel and universal joint—those prolific sources of wear, lost motion and imperfect register, taking the power direct from the cylinder wheel to the rack below—thus ensuring absolutely perfect register. It has the new "well" fountain, the new and positive "gripper" motion, patent feed

guides and "grasshoppers," and is built very simply, strongly and perfectly. Having the closest register of any press now built, the most thorough ink distribution, and three and four inking rollers, with right and left vibrators on the top of these and eight rollers on the table. This machine is peculiarly adapted to all kind of plain and colored letter press work,

Illustrated Newspaper,

And the very finest description of book work. It is so strongly built—having the celebrated "air springs"—and withal so very simple it can be run at a high rate of speed. Of this kind of press there are now three sizes built. The one we have in use is the largest, bed 34x53 inches between bearers, and costing boxed and delivered on the cars at manufactory at Chicago, all complete, with counting machine attached, \$3,010. Next comes the three roller "Double Medium," bed 25x38 inches between bearers, the handiest and best combined book and job press made, as it will print any and everything, from a common bill head to a book form of 16 pages; price, on cars, \$2,370. Third and last, the three roller "Super Royal," same style, bed 21x33 and price \$2,030.

Then follows the "Regular" fast first-class drum cylinder. This press is built very heavy and strong and finished in the highest style. It is intended more particularly for very heavy and fast work, such as railroad and fine colored printing. Its distribution, register, and general points, are the same as in the press we have in use, but the frame is made extremely heavy, four very heavy cross stays and otherwise built in proportion. Of this style the company is at present building four sizes: Medium, 23x28; Super Royal, 25x33; Double Medium, 29x42; and Double Super Royal, 34x53; the prices ranging about one-third higher than for the "Combination."

The company also builds Double Cylinders, of all sizes of the well-known "Taylor," "Washington" hand presses, proof presses, paper cutters, etc., and are prepared to make drawings and patterns for any desired size of either of their drum cylinders.

This company being emphatically the Western Pioneers in the manufacture of printing presses—and having, by dint of western pluck, hard work, and conscientious dealing already secured a splendid reputation and standing—and having so fully and honorably fulfilled its contract with us, our sympathies are entirely in its favor, and we will take

pride and pleasure in showing any purchaser or publisher on the Pacific Coast our beautiful machine in operation. The company have a just claim on the patronage of all western printers, and as long as it deserves, should have it.

It is perhaps due to our enterprising and well known fellow citizen, Geo. L. Faulkner, Esq., of the California Type foundry, 405 and 407 Sansome St., to state that our attention was first called to this machine by him—and that he is taking an active part in introducing it on the Coast, as agent, and in connection with his extensive Printers' Furnishing and Type Foundry Business, and he will take pleasure in answering all inquiries in regard thereto—sending the company's elegant book, the "Pressman's" Guide and "Press Catalogue" to all applicants, or showing the different kinds of the presses now in operation in this city.

Messrs. H. S. Crocker & Co., Messrs. Carr, Dunn & Newhoff, and Messrs. Winterhurn & Co. already have them in use, and other parties are about putting them in. Mr. F. has also recently sent them to Portland and Salem, Oregon, Carson City, Nevada, Napa and Santa Barbara in our own State, and already has and will keep both sizes of the "Country" drum cylinder on exhibition in his foundry. We also understand that Messrs. Painter & Co., the old and reliable type foundries are also acting as agents for these machines, and are also prepared to fill all orders promptly.

Finally, when it is considered that freights are about the same from Chicago overland on these machines, as by the Isthmus route from New York, and a great deal of time is saved, and that in case of breakage by accident or otherwise (all the parts being made interchangeable and kept on hand at the manufactory) the expense and delay is comparatively trifling—we think every member of our craft has cause to feel pleased at the advent of the "Chicago Taylor Printing Press."

CORRESPONDENCE.

Case-Hardening.

Written for the Press.

It is a very obvious fact, that a hard-working surface will last very much longer than a soft one, besides doing away to a very great extent, with the likelihood of the two surfaces cutting or ceizing—that bugbear of all engineers. I have seen the slide-valves and valve-seats of locomotive engines so soft, that face them down ever so true, before they had run for a month, the seat would be worn an eighth of an inch hollow, and the valve correspondingly round, on the surface, thus destroying very materially the working power of the engine, as it would be impossible in such a case for the engine either to receive, cut off, or emit her steam with the precision that is required. The valve motion, too, may be closed, all lost motion taken out of pins, pin-holes, etc., but the metal being soft, or merely smeared over with potash, will, before the engine has made many trips, give so much end wear away so quickly, that it looks like a useless expenditure of labor either to repair or make machinery and send it out to work in that style. How, then, is it to be avoided; what shall be done to remedy the evil?

As far as cast-iron is concerned, of course nothing can be done toward making that harder than it naturally is; but there is a process by which wrought iron can be made so extremely hard as to equal hardened steel—that process is case-hardening. I have been surprised to find this so much neglected both in the Eastern States and on the Pacific Slope. The process is so simple, and can be done with so little expense that, considering the immense advantages to be gained, it has been a wonder to me why there was not a case-hardening furnace put up at all machine shops. I have assisted at case-hardening in Europe and also in this country, and for the benefit of mechanics and the trade generally, I will give, in as clear a way as I can, the result of my observation and experience.

A furnace should be constructed of stone, well cemented together, walls not less than one foot in thickness; the size of furnace, of course, would be made to suit the quantity of work each shop had to do. Iron rods and stays should be worked in with the masonry across the furnace on which to lay the box, directly underneath being the fire space, the grate of which should stand one foot from the ground, so as to allow a good draft underneath and also room for the ashes to fall. If not convenient to build a brick or stone chimney, stovepipe will answer the purpose.

The box should be made large enough to hold the different-sized pieces of metal to be hardened; but it is better to have two boxes, rather than one too large and unwieldy to manage; as in that case trouble is likely to arise in getting the box out of the furnace, it being so extremely hot that it is impossible to handle it except with very long tongs, rakes, etc. The box should be made of $\frac{1}{4}$ inch sheet iron, well riveted together with angle iron.

The material used to mix in with the work consists of bones burned to a charcoal, with leather shavings, burned or not burned—it does equally as well. Indeed, in some shops neither the bones nor the leather is burned at all; but cut or mashed up very fine. This is mixed with charcoal and distributed carefully among the work to be hardened. If a piece of metal is of any considerable length, care should be taken to pack it well, for if it should rest only on its two ends it would surely get sprung in the middle, and vice versa. Lay the work carefully among the prepared stuff—one layer of stuff on the bottom of the box, then as much metal as can conveniently be laid down without letting the pieces touch each other; another layer of charcoal, etc., on the top of that, seeing that all the various holes in the work are well filled; then more work, and so on till the box is full. When fastening down the lid, it is ready for the furnace.

When the door of the furnace is closed, unless it fits very close, put some fine clay all round so as to effectually exclude all cold drafts that otherwise pass through the furnace. Some men should be detailed to attend to the furnace, and keep up a good fire, day and night, so that the box is kept at a dull red heat all the time. The time for keeping it in the furnace is generally twenty-four hours. At the expiration of that time the box should be drawn, and cold water having been previously prepared close by, it being kept cold by a continuous stream from hose or otherwise, the various pieces of work are picked out and as expeditiously as possible dropped into the water.

Let me say, here, that though it should be taken from the box as quickly as possible, to prevent the work from sealing, yet it should be done with the greatest coolness. I have seen men with their pokers and tongs dab into the red hot mass to wrench up from the bottom the pieces that lay there, either through excitement or ignorance, forgetting that as the work is red hot, the smallest blow will raise a nasty burr, which may prove troublesome to get off afterward. A small burr raised on the edge of, or in a hole that has to work, has occasioned the necessity of softening to get it out, as it is

impossible to touch work so hardened with a file of any description.

If the furnace has been attended to properly the work will now have a surface ranging from 1-32 to 1-16 of an inch in thickness, so hard that nothing but the grindstone or emery will be able to effect it, in making the various parts work together freely. A high and durable polish can now be put on by rubbing with emery cloth, and if the work has been carefully filed up, while in a soft state, it will look very nice indeed; but if, on the contrary, it has been filed too hastily or too carelessly, and deep scratches left, it will be impossible to polish it up, as the scratch will have widened and got black, defying the power of the polisher to make it anything else, but a deep, ugly scratch. The filing up work to be hardened, and leaving deep marks and putting on a high polish, to hide them for the time being after they come from the furnace, is very objectionable; it looks detestable to a practical mechanic. Only wrought iron can be subjected to this process. Cast iron is simply made more brittle.

A master mechanic that I was once working for, desired me to put in the box a piece of cast iron to test the effect, stating that he thought if the hardening process was good for wrought iron, it must be equally good for cast iron. I did as I was desired, and after all was cooled off I took the piece of cast iron and snapped it in two with my fingers.

If rank pins are required to be hardened, the plain part that goes in the wheel should be well wrapped up with clay, so as to prevent as much as possible the absorption of carbon by the metal, and when cooled, they should be put in a trough with water deep enough to cover the working part, the other being made to stand above the water.

MECHANIC.

Carlin, January, 1873.

Coal for Domestic Use in San Francisco.

What Kinds are Used in San Francisco—Where They Come From—Quantity, Quality, Etc.

Nearly all the coal used for domestic purposes in California is mined on the Pacific slope. West Hartley is used to some extent, but most of that sold by retailers for West Hartley is either mixed or entirely of some other kind. There is no true coal found west of the Rocky Mountains, with the exception of some veins on Vancouver Island, and possibly in some other portion of British Columbia. The coal veins of California and Washington Territory are of later geological formation than the anthracite beds of Pennsylvania and other Eastern States. The Pacific coast production is a species of lignite, not properly coal. Anthracite, sometimes called stone coal, is hard, black coal, does not soil the fingers when touched, fracture conchoidal, decrepitate in burning, kindles with difficulty, contains a very large proportion of carbon, very little oxygen, hydrogen, and nitrogen. Bituminous, or soft coal, varies much in color, weight and quality. Some species have a luster more waxy than that of anthracite, fracture uneven, often divided by joints into parallel; from 73 to 90 per cent. carbon, and from 8 to 22 per cent. oxygen, hydrogen and nitrogen, with considerable earthy matter and ash. The term "Bitumen" as applied to coal does not mean that it contains mineral pitch, but that oxygen, hydrogen and nitrogen give it a more inflammable character. The bituminous coals are divided into sorts according to their burning properties, such as "free burning," "smokeless," "non-eking," etc. The caking coals are those which tend to partially fuse while burning, emitting smoke and jets of gas. A single seam of coal sometimes contains layers of various quality.

Mount Diablo Coal.

The shipments of coal from the Mount Diablo mines are larger than those of any other mine on the coast, amounting to about 180,000 per annum. The coal is used mainly for the generation of steam. It is consumed in steamers, mills, and manufacturing establishments. Some years ago, before the miners had penetrated to any great depth, the coal contained considerable sulphur, which emitted an unpleasant odor while burning, and injured the reputation of the coal for domestic use. Since the opening of the Black Diamond, Union and Independent veins, the quality has improved, and although little is openly sold for domestic use, it is often disposed of under other names, and the housewife does not know that she is burning that "nasty sulphur stuff." The miners are now working in solid coal, of good quality. About twenty per cent. of this coal reaches the market in the form of screenings, which is sold at a lower price than the lump coal. In order to burn it without waste, furnaces are constructed with bare set close. It is the lowest-priced coal in the market, bringing, by the cargo, about \$6 per ton.

Although Diablo coal is much used on steamers, it is not taken on long voyages, the reason for which, it has been said, is its liability to spontaneous combustion. This the owners of the mine deny, saying it is no more liable to spontaneous combustion than is Cumberland coal, which is used extensively on ocean steam-

ers. The Pacific Mail Company have arrangements for supplies of coal at prices less than can be produced here, excepting possibly, the screenings of the Mount Diablo coal, which is not suitable for the use of ocean steamers. An experiment recently made by Allen Wilcox, at his works, No. 21 Front street, showed very little difference between the relative value of Mount Diablo coal and Oregon pine for generating steam to drive a water-lifter. He ascertained that one ton of good screenings, costing \$7 per ton, will raise 432,000 gallons thirty-five feet, equal to one and two-third cents for each 1,000 gallons. One cord at \$8 per cord, will raise 456,000 gallons thirty-five feet high, at the rate of one and three-fourth cents for each 1,000 gallons. Reckoning wood at \$5 per cord, each 1,000 gallons will cost one cent and one mill.

Bellingham Bay Coal.

The Bellingham Bay coal is used almost exclusively for domestic purposes, although it leaves a large quantity of ashes, and therefore makes considerable dust in the hearth or grate. It is a free-burning brown coal, with slaty cleavage and brilliant conchoidal fracture. Any person familiar with it can recognize it at a glance. The mine is on the eastern shore of Bellingham Bay, in Washington Territory, and is more favorably located for shipping purposes than any other on the coast, being at the very shore of the Bay, where it can be taken on hoard vessels at little expense. The property includes 1,641 acres of timberland. There is a good wharf at the mouth of the pit, where vessels are loaded. The deposits are very extensive. It is similarly to the Seattle coal in quality, and the latter has sometimes been sold for Bellingham Bay to persons who had become used to burning it, and desired that particular kind. It is a fact that people form attachments for certain kinds of coal. Often more in accordance with their prejudices than from any good, clear judgment, and they persist in having coal called by that name even at a higher price than they would have to pay for the same article under a different name. Some dealers sell Coos Bay, Seattle, Bellingham Bay and Rocky Mountain all from the same heap, which is very likely to be from Mount Diablo, the very name of which smacks of the evil one, to say nothing of the sulphur, which purchasers would be sure to smell if they only knew where it came from. The fact is, the lower strata of Mount Diablo coal is as free from sulphur as other coals of better reputation. The Bellingham Bay Company has been unfortunate during the last four or five years, the mine having been several times on fire, and also flooded with water. It is now in working order again, and is shipping 3,000 tons per month, with a prospect of speedily increasing the amount to 10,000 tons per month. The company own their own vessels—the ships *Lookout* and *Germania*, of about 1,500 tons carrying capacity each, and the bark *Amethyst*, of 500 tons. The stock is mostly owned in San Francisco.

Coos Bay Coal.

The Eastport Coos Bay coal mine is situated near Coos Bay, State of Oregon; the land belonging to the company (consisting of 1,600 acres) is nearly all underlaid by a coal deposit. The distance from the wharf to the mouth of the mine is three-fourths of a mile, and the loaded cars descend to the water's edge over a railroad of easy grade, by force of gravity, and are returned to the mines by mules. The coal is taken from the wharf as received, without screening. It is a clear, black coal, with lustrous conchoidal fracture, free from iron pyrites, no trace of sulphur, leaves comparatively little ash, and burns without any disagreeable odor. It is not so easily kindled as Seattle or Bellingham Bay, is less inflammable than Rocky Mountain coal, cakes somewhat in burning, and gives out considerable gas, which is consumed in puffs, without odor. The coal of the Newport Coos Bay Company is of the same general character. The cost of the coal delivered in San Francisco was formerly about \$7 per ton. The Eastport Company, by the construction of a tug boat and other facilities, have reduced somewhat the expense of reaching market. By aid of the tug they are enabled to cross the bar with less hindrance than formerly. The use of this coal, as well as the Seattle, has been very greatly increased by the suspension of work in the Bellingham Bay mines. Although the cost is less than formerly, the price is higher, being about \$12 per ton by the cargo. The Eastport Company sold 20,000 tons last year, lying one month idle, on account of a strike of the workmen. The Directors have declared a regular monthly dividend of one per cent. on the capital stock.

Seattle Coal.

The Seattle is an excellent quality of lignite, not properly coal. It burns freely, makes a cheerful fire in a grate, and answers well for cooking purposes, lighting more easily than most other kinds, and can be used where there is less draft than is required for Coos Bay coal. The Seattle mine is seventeen miles from the town of Seattle, Washington Territory. From the mine to the lake is four miles, over which the coal is shipped by narrow-gauge railroad. The coal is conveyed from the mine to vessels lying in port at Seattle without emptying the cars until the coal arrives at the vessel's side. The Company takes out an average of eighty tons per day; employ about 120 men, two steam tugs, two large barges, one steam engine, 40 horses and 160 two-ton cars. In 1871, 15,000 tons were shipped, two-thirds of which came to San Francisco. In 1872 they took out 35,000 tons, of which 25,000 were brought to this port. It brings \$12.50 per ton by the

cargo. The expenses are about as follows: \$3.50 per ton to mine it and put it in ships at Seattle; \$5 per ton for freight, leaving a net profit of \$4 per ton, or 30 per cent. The owners of the stock are residents of San Francisco and New York city. The demand for the coal is steadily increasing. If the Company owned ships in which to bring their coal to market, they could sell for a lower price and make more money.

Experiments With Coal.

Two years ago a series of very careful experiments were made with various kinds of coal by Chief Engineer Isherwood, at Mare Island, in order to ascertain the steam-generating power of the coal, the comparative quantity of combustible material in each, the rate of combustion, etc. His official report has not yet been published, but the following are some of the results ascertained. We select only those coals which are used to a great extent in this market, being the brown coal from Australia, Vancouver's Island and Washington Territory, and the lignite from Oregon, California and Wyoming. [No experiments were made with the Seattle coal, for which there is much demand here:]

	Coos Bay	Mount Diablo	Bellingham Bay	Nanaimo	Sydney	Rocky Mountain
Lbs. coal consumed in 24 hours	8,602	8,021	10,225	7,486	11,040	9,860
Lbs. ashes and clinker from the coal	696	991	2,507	934	1,552	1,641
Per cent. of the coal ashes and clinker	8.09	12.36	24.52	12.43	14.06	16.63
Lbs. of coal consumed per hour	358	334	426	311	460	411
Lbs. water vaporized from 1 lb. of coal	7,042	5,326	3,995	4,384	3,782	4,535

If a test of this kind were made at the present time the result would be more favorable for the Coos Bay and the Diablo coals, than is given above, for the reason that a better quality of coal has been obtained by deeper excavations. From this experiment, as well as by other tests applied, it is evident that certain varieties of coal sold in this market are not properly classified. A greater price is demanded than the ascertained quality of the coal justifies.

Experiments have also been made at Mare Island with a view to determine the number of pounds of coal required as an equivalent for one cord of the best live oak wood obtainable in this market, the result being as follows:

Nanaimo, Vancouver Island, B. C.	1,800
Bellingham Bay, Washington Territory	2,200
Seattle, Washington Territory	2,400
Rocky Mountain, Utah	2,500
Mount Diablo, California	2,600
Coos Bay, Oregon	2,600

The present retail prices of coal per ton in this market are as follows:

Sydney; \$17; Nanaimo, \$16; Bellingham Bay, \$15; Mount Diablo, \$12; Coos Bay, \$15; Rocky Mountain, \$16; Seattle \$16.
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The entire amount of coal production and importation during the last year was not far from 500,000 tons, of which 180,000 tons were from Mount Diablo; about 115,000 were from Sydney; and 26,000 from Nanaimo, Vancouver Island—a kind of coal used principally in making gas; a small quantity of Chilean coal was received, amounting to say 3,000 tons, and about 29,000 tons of English coal. The importations will undoubtedly continue to decrease, until none is received from abroad except as ballast. The home production will in a few years fully supply the demand. New discoveries are being made of deposits within easy reach of market, and should the quality of the coal prove as good as that already developed the price of coal must eventually decrease.—*Bulletin*.

Professor Agassiz on the Negro.

In a recent lecture Agassiz remarked: "I have pointed out over a hundred specific differences between the bone and nervous systems of the white man and the negro. Indeed, their frames are alike in no particular. There is no bone in the negro's body which is relatively the same shape, size, articulation, or chemically of the same composition as that of the white man. The negro's bones contain a far greater proportion of calcareous salts than those of the white man. Even the negro's blood is chemically a very different fluid from that which courses in the veins of the white man. The whole physical organization of the negro differs quite as much from the white man's as it does from that of the chimpanzee—that is in his bones, muscles, nerves and fibres, the chimpanzee has not much farther to progress to become a white man. This fact science inexorably demonstrates.

"Climate has no more to do with the difference between the white man and the negro than it has with that between the negro and the chimpanzee, or it has between the horse and the ass, or the eagle and the owl. Each is a distinct and separate creation. The negro and the white man were created as specifically different as the owl and the eagle. They were designed to fill different places in the system of nature. The negro is no more a negro by accident or misfortune than the owl is the kind of a bird he is by accident or misfortune. The negro is no more the white man's brother than the owl is the sister of the eagle, or the ass the brother of the horse. How stupendous, and yet how simple, is the doctrine that the Almighty maker of the universe has created different species of men, just as he has different species of the lower animals, to fill different places and offices in the grand machinery of nature."

MECHANICAL PROGRESS.

Rolling Molten Steel.

The *Engineer* figures and describes a very ingenious device recently invented by Mr. James Robertson, of Glasgow, for treating and shaping metals as they are poured, in a molten state, from a Bessemer converter or other vessel. The fluid mass is received between a set of rolls so placed as to retain the liquid metal until it becomes chilled sufficiently to be handled. The rolls, at the receiving end, are conically shaped so that the iron is gradually compressed and a delivering action set up in the mass of iron as it passes between and longitudinally along the face of the rolls.

The invention has not yet been put to a practical test, but much confidence is expressed that it will succeed. The greatest difficulty apprehended is in keeping the rolls at a temperature sufficiently low to prevent their becoming warped by heat or pressure, when working in direct and continued contact with a mass of metal at a temperature about 2,000°. The inventor proposes arrangements for cooling the rolls internally, and for subjecting them to sprays or jets of water externally, on parts opposite to those in actual contact with the molten metal.

This difficulty overcome, there will be no hindrance to the production of steel bars practically of unlimited length, directly from the converting vessel, and therefore at a great saving of reheating for subsequent rolling. The *Engineer* expresses much confidence in the success of the invention—a fact which, if accomplished, must have in its different bearings no small influence on steel manufacture, and one well worth the attention of constructing engineers everywhere.

LIME AND MORTAR.—The main results of certain recent experiments made to obtain accurate information on the process of the hardening of lime and mortar, as applied for ordinary building purposes, are that the freshly-applied mortar gives off, at first, water only, by which process the particles of lime begin to adhere together; afterward carbonic acid begins to be absorbed, and thereby the solidity of the mass is increased. The last stage of the drying of the mortar coincides with that of saturation of the lime with carbonic acid, and this process causes the fixation of the porous bricks with the mortar. The absorption of carbonic acid alone, without previous dehydration, never causes ordinary mortar to become hard. Freshly-made mortar exposed to an atmosphere of moist carbonic acid remains soft; while mortar placed under a bell-jar filled with carbonic acid, and standing over a basin filled with strong sulphuric acid, (which rapidly absorbs water,) becomes rapidly hard. Large quantities of mortar, especially with limited exposure to air, take months, or even years, to harden.

TOOLS VS. HANDS.—The late labor troubles and the advancing price of coal in England is operating as a spur to employers to devise ways and means to do the same work with less hands and less skilled labor. Tool makers are consequently reaping a rich harvest in the increased demand for tools of all kinds. Constant efforts are also being directed to devising new appliances as substitutes for human hands. It is thought that the current of engineering thought, for the coming year, will be more than ever turned to the invention of special machine tools. Cheap motive power is also a great desideratum, and is commanding an unusual amount of attention from constructing engineers. Improved engines for economizing power are also in great demand; especially is this the case for marine use, where compound engines are in great demand. Much the same results are also observed in this country, and there is no doubt but that inventors and their devices will attract more attention within the next year or two than ever before.

A NEW CRUSHING MACHINE.—A crushing machine of (as claimed) great effectiveness, has been constructed by M. Jannot, a French engineer. It consists of a wheel on a horizontal axle revolving around a vertical arbor, which receives its rotary motion by means of spur gearing. In its circular motion the wheel runs in the bottom of an annular trough with an open bar bottom containing the material to be crushed. When crushed the material immediately falls between the bars into a screen of conical form, which is divided into two parts, the fine parts passing through, the others being collected and placed in the trough.

STRAIGHTENING A CHIMNEY.—A chimney 208 feet high, belonging to the Lawrence Mills, at Lowell, Mass., was lately found to have been thrown fifteen inches from the perpendicular by a high wind and continuous rains. The leaning, however, was found not to begin until a height of about 100 feet had been reached, the lower portion being still upright. The remedy employed was, to saw the mortar between the bricks, by which method the inclination was corrected at the rate of three inches in twenty-four hours and the chimney was thus gradually restored to its proper position.

The manufacture of iron rails in the United States has doubled within the last ten years.

TEMPERING STEEL.—Since, in tempering steel, the colors owe their appearance to the formation of an exceedingly thin superficial skin of oxide, it is evident that the steel, when withdrawn from the fire, does not retain its first color, but there appear other colors in consequence of a subsequent oxidation by the air, until the steel is sufficiently cool. Of a certain color, one can only judge with certainty by examining the conditions under which it occurs. If two pieces of steel are heated until the yellow color appears, and if one is withdrawn, it may become in the air purple, violet, and finally blue, while the other piece assumes the same colors in the fire. However, if both pieces when blue are dipped into water, they assume different degrees of hardness, i. e., the one which turned blue in the air will be harder than the one left in the fire. Hence, it follows that proper caution must be observed in this respect, and steel must either be cooled rapidly, when the right color appears in the fire, or it must be withdrawn at a preceding color, if the color is to appear by after annealing. Sometimes it is intended by the process of annealing to give to articles an attractive appearance, and at the same time to prevent them from rusting by the formation of a layer of oxide. In such a case, uniform quality and heating is required.—*Storet.*

THE DANK'S FURNACE.—Mr. Danks was present at the late meeting of the National Association of Iron Manufacturers, at Philadelphia, and his introduction and remarks formed the feature of one of the evenings. Mr. Danks gave his experience with the iron trade of England, and said that in spite of the efforts of interested parties, he had successfully introduced the furnace throughout England and in Scotland, while in France, Belgium, Austria, Sweden and Norway, furnaces upon his system were being erected. Mr. Danks fully described the construction and working of his furnace to the meeting after which he was submitted to a long series of questions, to which he responded freely.

Much valuable information, not heretofore published, was elicited, and Mr. D. was elected an honorary member of the association, "in view of the eminent services rendered by him to the iron manufacturers of the United States by his inventions and successful efforts in the line of mechanical puddling."

THE PRODUCTION OF MANGANESE.—There appears to be dawning upon us the possibility of reducing manganese on a metallurgical scale from its ores. It is somewhat remarkable that a metal which possesses such peculiar and valuable properties should have so long resisted the attacks that have been made upon it. We really know very little about it, and it is only recently that its reduction from its ores has been accomplished in any quantity. It is generally stated in the books that is necessary to keep metallic manganese either hermetically or inclosed in nephtha. If we had never seen iron in larger fragments than a hazel nut we should be apt to come to the same conclusion. It was only when iron was worked by the ton that we were led to know its properties. When we have manganese in equal quantities we may discover that it can also be safely left outdoors, if protected by paint, and we shall doubtless find its alloys of great value in the arts.

SAILS VS. STEAM.—Few are aware of the great revolution that is going on in England in the way of substituting steam for sails under the foggy skies in the narrow channels and in the stormy climate of Northern Europe. The steamers have advantages over sailing vessels so great that the latter will be excluded from all the larger classes of business. In the last six years, the annual tonnage constructed, of sailers, has fallen nearly seventy per cent., while that of steamers has increased seventy per cent. Whether the steady breeze and the placid waters of the Pacific are to become the monopoly of the steamers is still to be determined.

PECULIAR BOILER DEPOSIT STEAM-SPACE.—E. Mateczek relates a peculiar formation of boiler deposit in the space not filled with water, but with steam. The sp. gr. of this material was found to be 1.383, and its chemical composition, in 100 parts, as follows: Water, 2.831; fatty matter, 1.430; organic matter, 21.995; silica, 21.713; sulphuric acid, 6.947; chlorine, 0.136; oxide of iron, 3.836; phosphoric acid and alumina, 7.878; lime, 15.752; magnesia, 4.151; sand and clay, 12.283. The water used as feed-water for this boiler was taken from the river Elbe, but the large proportion of organic matter is in a measure due to the fact that the feed-water is taken from the condensed hot water of the air pumps, the boiler being used in a beet-root sugar works and refinery.

MECHANICAL AND MORAL PROGRESS.—Mechanics are moral reformers in the broadest sense of the term. They may work with an eye single to their daily wages, but they are nevertheless gradually changing the whole drift of human affairs. Every machine, large or small, be it a one thousand horse-power engine, or a kitchen mangle, is an engine for the advancement of the moral as well as physical nature of the race. Every blow the smith strikes in his workshop is a blow at the slowly yielding barrier that separates the dimly-lighted "now" from the clear light of the "yet to be." Spencer himself would never have been the great leader of thought that he is, had it not been for millions of just such blows. Blows preceded hooks, and books were before Spencer.—*Am. Artisan.*

SCIENTIFIC PROGRESS.

Electrical Phenomena—Ball Lightning Explained.

It was formerly assumed that great masses of clouds—thunder clouds—are themselves the generators or sources of those great charges of electricity which result in thunder and lightning; but late investigations render it more probable that such clouds merely act the part of the coatings of a Leyden jar to accumulate and concentrate the charge at some projecting point—a positive pole, whence it may pass by an eruptive discharge to a negative pole. Electricity exists in the air, whether cloudless or otherwise, and a heavy, moving cloud, merely acts the part of a carrier or accumulator, the charge of which continues to increase until its intensity is sufficient to jump the chasm which exists between it and the nearest negative pole—be it another cloud or some projecting conductor presented by the earth.

In a paper recently read before the Society of Telegraph Engineers, of London, by W. S. Proce, Esq., we find the following in reference to some of the various phenomena presented by atmospheric electricity:

Lightning is usually classified into *sheet*, *forked* and *ball* lightning. *Sheet* lightning is merely the reflection of forked lightning, or the electric discharge which has occurred somewhere out of the field of view. *Forked*, called *zig-zag* or *chain* lightning, is the light produced by the disruptive discharge between cloud and cloud, or between cloud and earth. *Ball* is of a very different character. Many of the so-called "balls" are undoubtedly optical illusions, and Faraday himself stated that they were incompatible with what we know of electric discharge. "There may be balls of fire," said he, "but they are not electrical." Yet the evidence of balls of blue fire rolling along the surface of the sea, and suddenly terminating in terrible electric discharges over ships; masses of fire rolling along the ground towards buildings, ending in fatal discharge, and many other cases, leave it unquestionable that some such phenomenon as globular or ball lightning exists. Some have explained them to be balls of incandescent gas, rendered so by the discharge; but Mr. Cromwell Varley has recently offered a more acceptable explanation. According to him, ball lightning is a luminous spot on the earth, terminating a current or brush discharge from a negatively charged cloud. This spot moves with the cloud. Illuminated lines of force are projected from some point in the cloud upon the earth. He has been very successful in repeating the effect experimentally, and he suggests this fact as an explanation of the photographic images imprinted on the skin of persons struck by lightning.

I quote from memory: "When after a serene sky, thunder clouds form in the distance, the observer sees the clouds and the illumination of the lightning displayed before him as a magnificent picture; and what he often takes to be forked-lightning (i. e. the actual flash, and not the reflection of it) appears to run through the clouds in the most beautiful manner." "That which is thought to be the electric discharge is only the illuminated edge of a cloud, beyond and behind which the real discharge occurs. It is in its nature like the bright enlightened edge which a dark well-defined cloud often presents when between the sun and the observer, and even the moon also frequently produces similar appearances. In the case of its production by lightning and distant clouds the line is so bright by comparison with the previous state of the clouds and sky, so sudden and brief in its existence, so perfectly defined, and of such a form as to lead everyone at the first moment to think it is the lightning itself which appears."

Hence many of the errors made as to the character, shape, and condition of the lightning flash.

OXYGEN ON LIFE IN WATER.—According to Dr. Carpenter, if we go deep enough in the open sea we shall always find the temperature as low as 32°; but in inclosed seas, such as the Mediterranean, the deeper and colder water, circulating from the poles, cannot enter; therefore the lowest bottom temperature is determined by the lowest winter temperature of the surface. Scarcity of life in the Mediterranean he considers to be owing to a deficiency of oxygen in the water, due to its combining with a large quantity of organic matter brought down by the rivers and emptying into it. Thus, while in the Atlantic we usually find 20 per cent. of oxygen and 40 per cent. of carbonic acid, in the bottom waters of the Mediterranean there is often only 5 per cent. of oxygen and over 65 per cent. of carbonic acid.

SCIENTIFIC PROGRESS.—What would the great father of British chemistry have said, had he stood in the lecture room of the Royal Institution, where his great discoveries were made, and seen the burning hydrogen extracted by our great countryman, Graham, from a meteorite, the heat and light of another world; or could he look with Lockyer on the burning flames of hydrogen, which dart up from the sun to a height of 50,000 miles, or could he read the flashing telegrams which so rapidly run around the world, that our notions of time are completely upset, and we actually receive intelligence to-day which was sent to-morrow.

High-Pressure Steam—Compound Engines—The Locomotive.

At the last meeting of the Scientific and Mechanical Society, of Manchester, England, the President, Sir William Fairbairn, in his opening address spoke on the subjects above named as follows:

It has been my province for a great number of years to encourage and eliminate the force of high-pressure steam, and by working it extensively in properly constructed engines, to effect a saving of fuel under any condition and every circumstance to which it is employed. I need scarcely inform you that much has already been done in that way, and that a saving of one-half the fuel has been effected by working high steam expansively over what could be accomplished forty years ago. I am not prepared to state the amount of pressure to which steam may be increased; but, I have reason to believe that we are still far short of the maximum to which the pressure of steam and economy of fuel may be carried. We are still far short of the economy which may yet be obtained by working steam expansively, and the interesting question—which has never yet been solved—as to whether the system of expansion should be done in one, two, or more cylinders, requires to be determined. There are strenuous advocates for each system, and I have myself gone so far as to encourage the use of three-cylinder engines in order to determine its efficiency as compared with the double and the single cylinder engines. Now, in every case of mechanical construction, I have ever been the advocate of simplicity, and never employ two things when one is sufficient; and I therefore prefer the single cylinder, with a proper cut-off apparatus, to one or more cylinders effecting the same object. Among engineers and manufacturers there is great diversity of opinion, not only as regards the advantages of high steam, but the way in which it should be applied. This diversity of opinion should not, however, discourage the thoughts and labors of original thinkers. On the contrary, it ought to invigorate active minds, correct ignorance, and exhibit, by actual experiment, that hastily formed schemes are injurious, and that nothing is sound in physical science unless founded on the unalterable laws of nature. What I would therefore recommend would be that the investigations, thoughts, and aspirations of the Society should be to subjects that lead to definite laws, by which ingenuity may be strengthened and from which we cannot retreat.

The Locomotive Engine

Has undergone many changes since it was first introduced, and nothing has contributed more to its success than the introduction of high steam. It has been in good hands ever since the days of George Stephenson to the present time, and we have only to trace its energy and growth to assure ourselves that it has not attained its present high state of perfection without the assistance of some of the master mechanical minds of this and other countries where it has made its appearance. It still remains to be seen what further improvements can be made, or whether an increase of pressure and greatly increased expansion may or may not diminish the consumption of fuel without effecting the efficiency of the engine. As regards the design and organization of the engine as a machine, much cannot be done, as its adaptation in most cases is admirably arranged for the purposes for which it was constructed, and all that appears wanting is a series of well-considered regulations to insure safety as it traverses the different lines from one end of the kingdom to the other. These are considerations for the management, more than the engineer or man of science, but there is, nevertheless, room for thought and meditation, sufficient to engage the attention of the Society in its endeavors to effects further improvement.

FORMATION OF FLINT.—Mr. Solas, at a late meeting of the Geological Society of London, said that he did not think that any mere mineral change could account for the forms of flints. Alluding to some previous remarks, he said he had only dealt with a limited portion of the question of the origin of flint and coprolites. Of the organic origin of the latter he thought there could be no doubt. Flint was formed not by the silicification of sponge tissue, but by that of animal matter. He thought that the non-silicified condition of recent dead sponges might be due to a defective supply of silica in the sea water. He had not put so much stress on dialysis as had been supposed, but relied mainly on the deposition of flint by means of organic matter. From the presence of *silicious* spicules of peculiar forms in the coprolites, he could not accept them as of Alcyonarian origin.

RECOVERING GOLD AND SILVER FROM PHOTOGRAPHERS' TRIMMINGS.—The *American Chemist* recommends the following process: Burn the paper carefully, and then treat the ash with chlorine gas to convert the precious metals into chloride. The ash may then be thrown on a filter, the gold chloride separated from the silver chloride, by washing, and the two reduced at pleasure. The recovery of gold from the slops, by means of ferrous sulphate, is extremely faulty, if it is intended to use the gold afterward for photographic purposes, as iron, in the form of a basic ferric salt, is almost sure to be mixed with it. Kniger recommends precipitating the gold by the addition of ammoniacal chloride and hydrochloric acid, which precipitates it absolutely pure.

the lower depths. Work of exploration is going on.

HOWARD HILL.—This mine is located about 2 miles east of town. The shaft is down 390 ft., or 100 ft. below any former working. From the bottom of the shaft drifts to the east and west are being run, and each of these is in about 30 ft. The drift to the east is in quartz which shows free gold and heavy sulphurets. The drift to the west is also in quartz. In both drifts there are fine veins. In years past in the level above the lowest level, now being worked, splendid ore was found to both the east and west of the shaft. In a few days the lowest level will reach the line of the old pay chute, and already there are signs that the ledge is getting good.

INDEPENDENCE CON.—This Co. own a tunnel claim at Independence Hill, near Dead Man's Flat. The tunnel, in all probability, will run through the mountain, and cut in its course some 3 or 4 large ledges, which crop out on the surface, and probably some blind ledges. It is now in 352 ft., and in very hard rock. Several stringers of quartz are now seen in the end of the tunnel, and the stringers prospect well in a hand mortar.

DATSY HILL.—This mine is still doing well. The last crushing gave \$42 to the ton. The shaft is down 315 ft. on the ledge, and miners are running levels from that depth. The quartz which is being taken out comes from the 225-ft. level, and to all appearance is superior to that recently crushed.

GREEN MOUNTAIN.—They have been running 5 stamps most of the time during Jan. The work of development has been going on, and the developments are such that the month of Feb. will give a splendid result from the mill.

NORTH STAR.—They have splendid ore in the new shaft which is being put down at a point east of the dry house, the ledge being well defined and strong.

WEST IDAHO.—The Co. have claims located on Slate Creek. The location consists of 1,500 ft. on the ledge there being good rock on the croppings.

PLACER COUNTY.

RICH STRIKE.—Placer Herald, Feb. 1. Two men (whose names for the present we enquire, as well as the exact locality where the treasure lies) have struck a fabulously rich quartz lead, less than 3 miles from here. We have seen a 15 ounce lump of the rock, and should say that fully 6 ounces of the weight is pure gold. Last Thursday they had come 2 or 3 hundred pounds of this rich rock. The quartz is a dirty white color, and literally sewed together with pure, bright, thread gold. They have a shaft down some 9 ft., and had traced the ledge by its rich croppings to this point and there started the shaft on what seemed to be the richest locality.

GOLD RUN.—Cor. Placer Argus, Jan. 29: At one time this winter there were 10 or 12 claims worked in this district; at the present time I believe there are but 6. The Pine Top, Church, Golden Gate, Gold Run and the Home Ticket have expended operations and will so remain till more water comes. The Pacific, Union, Harriman and Taylors two claims, Gold Run Hydraulic, (formerly the Cedar,) and the Indiana Hill claims are still running and with a certainty of good pay as long as they can wash. The Indiana Hill claims have a splendid rig, probably the best in the district, they use 500 inches of water with a pressure of about 300 ft. The last clean up of the Pacific was, I am told, the largest ever made in the district with one exception; the exact amount I do not know, but \$7,000 more or less.

SIERRA COUNTY.

REIS.—Downville Messenger, Feb. 1: The new mill was started about 10 days since, and the new wheel found of sufficient power to run all the stamps, pans, settlers, etc.

INDEPENDENCE.—The improvements on the mill are completed.

ALLEGHANY.—Our mining interests are looking brighter. The Buck Eye has struck splendid prospect. The Highland & Masonic is now taking out good pay. The Twenty One Quartz Mining Co., is still sinking, and their ledge improve as they go down.

GISSONVILLE.—The Rip Van Winkle Hydraulic Co. are in full operation. They had cut a small pile of gravel at the coming of water, drifted from a pillar left standing by the former owners, from which they cleaned up nearly \$3,000 including \$1,300 taken from a boulder found in the pillar. The Chalcedony, Boot-jack, Union and Nevada are reported as paying fairly. The Pilot, at the upper end of the Valley, adjoining the North American, is a new claim, now running out the first gravel, after years of expense. They have done no washing as yet, but report paying prospects.

TUOLUMNE COUNTY.

SANTA MARIA.—Sonora Democrat, Feb. 1: The first clean up at this mine was made on Monday after 6 days run with 10 stamps, crushing 60 tons of ore that yielded \$3,000, or \$50 per ton. The ore crushed was all taken from the tunnel being run in on the vein, and is regarded as a fair test of the average rock. The tunnel is 50 ft. in the pay chute, the vein averaging 2 ft. in width. From surface indications the pay chute is 120 ft. in length, pierced 50 ft. by tunnel.

KERN COUNTY.

GOOD CLEAN UP.—Havilah Miner, Jan. 25: Joseph Moeman & Co. were the fortunate recipients of \$600 from a little batch of rock, about 25 tons.

ST. JOHN.—They have now attained a depth of 500 ft. on their mine. The lower level shows a body of ore from 6 to 7 ft. in width. There

is now rock enough in sight to run the company's 12 stamp mill for 3 years. Some of the richest rock ever found in the mine was struck last week.

PIUTE.—The mining prospects are splendid. The Bright star mine has opened on its new level with an average ledge of 6 ft., and very rich.

MARIPOSA COUNTY.

PINE TREE.—Mariposa Gazette, Jan. 31: Early last week the Co. set some men to work in an old tunnel which had been run for the purpose of taking rock out of the old Pine Tree. On following this vein 8 or 10 ft. to the northward it was found to increase to a width of 3 ft. with well defined walls. The rock appears to be very rich, showing free gold throughout the whole of it.

Nevada.

ELY DISTRICT.

ARKANSAS.—Pioche Record, Jan. 26: Drift is in 65 ft. from the 550-ft. level. A vast extent of good ore is exposed.

BULL CROSBY.—This is a ledge between Pioche and Ely. The vein when first struck is 7 ft. wide, and the ore is good.

BURLEY.—A strong vein of very rich argilliferous galena has been entered, at a depth in the main shaft of about 50 ft., and the indications are that it is permanent in character.

CHIEF OF THE HILL.—Last Thursday afternoon the main shaft started on a run of 10 tons of high grade ore from this mine. The main shaft is now down 90 ft., timbered from top to bottom.

CHIEF, EAST EX.—The winze below the 90-ft. level has attained a depth of 85 ft. The ledge is well defined all the way. Are starting a prospecting drift eastward 40 ft. from the top of the winze, which is now in 18 ft., with small streaks of splendor ore coming in.

ELVEN.—The main shaft is now 200 ft. deep, from which point the first level was run out. It will cross the vein at 300 ft. The ore is looking well in all parts of the mine. There are now on the dump 100 tons of first-class and about 200 tons of second-class ore.

HORN & HUNT.—There are now on the dump at least 100 tons of second-class ore from the back ledge, which will average about \$20 a ton, about 10 tons of first-class ore, averaging from \$500 to \$700; and about 75 tons of ore from the front ledge, averaging \$100 a ton. The main shaft on the front ledge is down 140 ft., below the tunnel level. The east drift is in 80 ft. and west drift 40 ft. and the ledge is running from 18 inches to 4 ft., well-defined, with fine walls. The east drift from the tunnel level on the back ledge, is 100 ft. long, and the west drift on the tunnel level is 60 ft. A winze has been sunk 33 ft. below tunnel level, with drifts from the bottom thereof about 80 ft. each way. Have just commenced stowing in this ledge, and one also is up 40 ft., ore showing good in all parts.

MARRON.—The main winze is now down 248 ft., all the way on the ledge, which is now 3 ft. wide, and looks very promising.

MILPAPA.—A large quantity of very rich ore are still being brought to the surface, and the ore-breasts are undiminished in extent and riches.

NEWARK.—A magnificent new body of ore was struck during the week in the main shaft of this mine. The vein is very wide where crossed by the shaft, and the ore assays well.

PIUTE.—Shipments of ore from this mine for the month amount to 135 tons. There is now on hand, ready for shipment, a large amount of bullion—well on to 700 pounds.

PORTLAND.—During the week a rich strike was made in the winze, the vein widened out vastly, and the assays show an increased richness in the ore.

ST. JOHN.—The tunnel is now in 120 ft. and 25 ft. more will strike the ledge, and 75 ft. more the incline. There are now about 30 tons of ore on the dump-pile, which will average \$100 per ton.

STANDARD.—Down 170 ft. in the working shaft; drifting east and west on ore 2 ft. wide. Ore assays from \$119 to \$581.

EUREKA DISTRICT.

ORANGE.—Eureka Sentinel, Jan. 30: One of the richest strikes ever made in this district has just been realized in this mine, which is located on Prospect Mountain. At a depth of 350 ft., a ledge of beautiful white quartz and a vein, at present over 2 ft. wide, has been reached, presenting a mottled appearance, produced by accretions of bluish silver ore, thickly interspersed among the rock, with a small quantity of arseniate of lead staining other portions. It is a fine milling rock, and assays \$113.37 in silver.

BELMONT.

EL DORADO SOUTH CON.—Reese River Revue, Feb. 1: This Co. are working in the south incline of the El Dorado mine, on the largest and richest breast of ore ever have ever seen in Eastern or Middle Nevada. This breast now measures over 15 ft. from foot to hanging wall. The stopes in the 240-ft. and 340-ft. levels, from the main incline, are looking splendid and the ore is of a better quality than it formerly averaged.

MONITOR CO.—The upper tunnel stopes look as nice as ever and are turning out large quantities of rich chlorides also turning out fine milling ore from lower tunnel stopes. The Monitor mill is crushing over 20 tons of Monitor mine ore daily and is producing very fine bullion.

WASHOE.

ALAMO.—Gold Hill News, Feb. 1: The main north tunnel is in 110 ft., making good progress. The old shaft on the hill has been cleaned out and repaired to the depth of 120 ft.

BELOHER.—Daily yield, 300 tons, about 100 of which comes from the 1,200-ft. level through the winze, 200 ft. from the Crown Point line. The ore body at the line of the Crown Point at the 1,300-ft. level is not only the largest and richest ore body the world ever knew of, but its real immensity is as yet undeveloped, as it grows wider and longer, increasing in all directions as greater depth is attained.

CALDERONIA.—A second cross-cut west from the main north drift on the 400-ft. level of the new shaft has been made, cutting the ledge at point further northward, showing a very decided improvement in the quality of the ore.

CROSSLAR-POTOSI.—Daily yield 120 tons, the assay value of which is \$36 per ton.

CHOWEN POINT.—During the past week ore has been rushed out at the rate of nearly 500 tons a day, principally from the 1,000-ft. level. The 1,300-ft. level opens out richer and richer. There is no sort of indication of the bottom of the ore body being reached. The yield of the mine for the past month of January is expected to foot up to about \$700,000.

HALE & NONOSES.—The daily yield of ore has been increased to a small extent during the week, and the average value of the ore has been improved.

JULIA.—The 1,000-ft. station is finished ready to commence the work of drifting. Sinking the shaft for a new level has been resumed.

KENTUCK.—The old workings are yielding about 25 tons per day of very good ore.

OVERMAN.—The main west drift is again cleaned out, repaired, and work resumed in the face.

SAVAGE.—Sinking the incline is making steady progress. The main shaft drift on the 1,600-ft. level, to connect with the winze from the 1,500-ft. level, is progressing. The main north drift on the 1,600-ft. level, to connect with the south drift from the Gould & Curry is driven ahead.

SIERRA NEVADA.—Daily yield, 60 tons of good milling ore.

SUTRO TUNNEL.—Total distance in, 3,583 ft. Excellent progress is being made in sinking the shaft along the line of the tunnel.

VINDICATOR.—The main north drift on the 1,167-ft. level from the Gould & Curry shaft is still driven ahead. The drift, although being run outside of the ledge, has cut several stringers of quartz and ore.

WOODVILLE.—The ledge is being cut through at the second level and opens out finely with excellent ore as in the level above.

EMPIRE MINE.—Virginia Chronicle, Feb. 1: It is reported that a body of ore has been developed which extends the entire length of the Empire ground, 75 ft., and also through the grounds of the Trench and Eclipse which lie between the north and south Empire, that will mill from \$30 to \$45 per ton.

IMPERIAL.—The Imperial-Kempire shaft is 1,700 ft. deep. The drift running south on the 1,700-ft. level has been cut through the quartz at a depth of about 100 ft. from the 1,600-ft. level. The winze now being sunk from the 1,600 to the 1,700-ft. level is in ore that assays on an average \$80 per ton.

OPHIR.—Since the new shaft of the Ophir was commenced the prospects in this mine were never better than they are at present. On every level that is open, and a cross-cut has been made, the quartz has been found. From the shaft on the 700-ft. level for 900 ft. north they have very favorable indications.

MINT.—Gold Hill News, Feb. 4: Superintendent Coleman left for San Francisco last evening, in order to procure requisite hoisting machinery. The shaft in sinking passed through the ledge, developing very fine ore, and now, owing to the ledge running and the other way they had the bottom of the shaft cutting it again and developing much better ore than at the other point mentioned. In fact, some of the ore is of the richest silver sulphuret character, and will pay well under the stamps.

S. F. ALTA. Feb. 6: The Superintendent of the Mint mine arrived yesterday from Virginia City, bringing a quantity of ore taken from the shaft at a depth of about 90 ft., and assaying from \$740 to \$4,600 to the ton. Much of this ore consists of black sulphur of silver, similar to the richest that have been found in any of the Comstock mines. The extent of the ledge, where it has been struck, covers the whole of the bottom of the shaft, which is 4 ft. square, but its entire size has not yet been ascertained, as the hoisting machinery has not yet been fully adapted to keep the shaft clear of water. The shaft is situated about 460 yards southeasterly from the Savage mine, and 700 yards from the Gould & Curry.

Arizona.

YAVAPAI CO.—Prescott Miner, Jan. 18: The Del Paso mill is running on ore from their War Eagle mine. The Marcus Co. are still crushing quartz and making money. Immense banks of gravel have been found in the Santa Maria country, that will, sooner or later, be worked, as said gravel contains gold in paying quantities. Water is plentiful. The placer miners around Prescott are doing well.

YUMA CO.—Our Arizona city contemporary says that Messrs. Hopkins & Miller are pushing work on their mines in Castle Dome District, and shipping much ore to San Francisco.

MOHAVE CO.—Baker's furnace, at Chloride, started smelting ore the 5th inst., and on the morning of the 6th had run out 30 bars of bullion. The ore the furnace is working is, taken from the veins near Cerbat and hauled to Chloride, about 14 miles.

CORY & POTTS. Cerbat, have just shipped 5 tons of ore to San Francisco, which is expected to yield at least \$1,000 per ton.

The Gunsight is said to be turning out ore of extraordinary richness.

Colorado.

LITTLE GIANT.—Georgetown Mining Review, Jan.—This ledge lies on the left side of Axtell Gulch and is clearly exposed for 80 ft., the crevice being narrow, scarcely exceeding 18 inches containing seams of pay consisting of free gold, iron pyrites and argilliferous galena.

GREEN MOUNTAIN BOY.—This is a huge crovice on the crest of the mountain 50 ft. in width, its walls being distinctly marked and pay visible from the surface; 3 miles off, what is believed to be the same vein, has been struck.

CLEAR CREEK CO.—The length of the following tunnels in number of feet is: Eclipse, 630; Douglass, 280; Helmick, 520; Baltimore, 680; Burleigh, 1,350; Marshall, 1,300; Antelope, 125. The Baltimore has expended \$100,000 and the Burleigh \$150,000. The Marshall intends to tunnel through Leavenworth Mountain a distance of 3,912 ft. intersecting at least 50 ledges thereby, including the most valuable silver veins in the Territory.

RED CLOUD.—This mine produced in the last 4 months \$61,000.

CROCKAW.—A shaft 100 feet deep revealed pay ore at one place 12 inches wide. In 1868 ten tons produced 160 ounces of silver per ton and 60 per cent. lead.

HOMESTEAK.—Situated in La Paz Co., and was sold by discoverers for \$25,000. The vein averages 4 ft. wide and the ore seam from 10 to 24 inches. The mill returns vary between 250 and 300 ounces of silver with 25 to 75 per cent. lead.

Montana.

NEW STRIKE.—Montanian, Jan. 23: Several fine quartz veins were left at our office, this week, taken from a newly-discovered ledge near Ryan's Junction. It is claimed that 4 ozs of bullion were pounded out of the rock by hand-mortar process. The new ledge is said to be 2½ ft. wide.

PLACER DISCOVERY.—Helena Herald, Jan. 23: We learn that new and very promising placer diggings were last week discovered in the Left-hand Fork of Little Deep Creek, Meagher Co. The report comes that as high as \$1 dollars had been panned out in one day from the Prospect shaft. The lucky miners were in Helena, on Saturday, purchasing sluice lumber, tools, grub, etc., and departed for the new El Dorado.

NEW DIGGINGS.—Deer Lodge Independent, Jan. 25: We are informed that the prospecting party, who were prospecting for some time in Bear Straight, a tributary of German, went through a false bed-rock last week and struck a paying strata of gravel underneath. The indications are that the gulch will pay for some distance, and is longer than German.

GERMAN.—The miners are busily engaged sawing blocks, repairing flumes, telegraphs, etc., in order to be ready for the coming mining season. The Chinese miners have been working all winter, having kept fires burning day and night all the time since the cold weather commenced.

Utah.

LITTLE COTTONWOOD DISTRICT.

VALLEY.—Salt Lake Tribune, Feb. 1: From the back end of the 80 ft. tunnel there are 2 stopes running upwards, one a distance of 125 ft., and the other about 75 ft. In these stopes can be seen an immense deposit of ore, varying all the way from 2 to 6 or 8 ft., though the ore body has not been cut through in some places, consequently it is difficult to determine the size of the ledge. In the lower level there is a continuous vein of ore the width of the distance run that will average perhaps from 2 to 3 ft., the grade of which is higher than that taken from the stopes above. The character of the ore taken from this mine is galena and carbonate mixed, and is said to be worth 50 ounces in silver to the ton, and carries 45 per cent. lead.

MINER DONNELLY.—Revealed the Anador and Eberhardt mines were bonded for the sum of \$40,000, to Q. A. McCone, to be placed in the Canadian market. These mines are situated directly west of the Fuller mine, the first named of which, is on what is thought to be a continuation of the Fuller lode. The assay value of the ore taken from both of these mines, near the surface, is about \$75 to the ton.

GRASS VALLEY MINES.—Mr. A. Delano who was for many years Recorder of the Grass Valley mines, last week delivered a lecture, which was reported in the Grass Valley Union, in which he makes some interesting statements. He says there are about 11,000 distinct quartz ledges recorded, of which it is safe to say 500 can be worked to a profit with improved appliances, and would employ 25,000 men. Of all these mines in a territory of about five miles square, only ten or twelve are being worked. In contrasting the gold yield of early days with the present, the speaker remarked that in the early days, with a working force of 5,000 men, something like \$300,000 was taken out monthly, mostly from surface diggings, now mostly worked out; while now with the few mines at work, some but recently opened, the monthly shipment is about \$250,000 and is rapidly increasing. Now, 2,000 men are taking out over two-thirds as much gold as 5,000 extracted fifteen or twenty years ago. Mr. Delano approximates the total gold yield of Nevada county, since its discovery, at \$105,000,000, of which Grass Valley yielded \$40,000,000; Nevada City probably shipped \$40,000,000; San Juan at least \$10,000,000; Columbia, North Bloomfield, Washington, Omega, Cherokee and Woolsey's Flat \$10,000,000; other localities \$5,000,000. There are yet miles of mining ground untouched.

WHELPLEY & STORERS' PULVERIZER.—At the "Big" mine in Calaveras county one of Whelpley and Storers' Pulverizers has been erected, and according to the Angels Mountaineer is giving good satisfaction. Some 1,200 pounds of hard rock from the Seefford mine, near San Andreas, was put through as a sort of test. The Mountaineer gives a description of the machine, but as we have already given an illustration and frequently referred to it, our readers are doubtless familiar with its general construction. The paper above mentioned thinks that "it is destined to bring about a revolution in the system of quartz crushing, for not only does it do away with the erection of costly mills and works, but crushes ore to a greater degree of fineness than any mill ever could." The editor predicts that it will eventually supersede all milling processes for crushing ore. As a prospecting machine it is specially useful, as ores can be practically tested without expensive works being erected.

THE CIVIL CODE ON CORPORATIONS.—The County Recorder calls attention to the fact that several newly formed corporations have not complied with section 365 of the new Civil Code, which requires all corporations to file and record their by-laws at the office of the Recorder of the county in which the headquarters of the corporation is situated.

FOUNDRY WORK.—At the Occidental Foundry in this city the monuments to be used in making the boundary line between Nevada and Oregon are being cast. The monuments are quite plain, and bear the letters "Nevada, Oregon, Longitude, Degrees," and were designed by Colonel Von Schmidt.

TANNER RAILROAD BRAKE.—The Tanner patent brake extension claims are engaging the attention of the House committee on Patents this week. This is something which is of interest to all railroad companies.

WILD TURKEYS.—A number of wild turkeys from Illinois have been received in this city during the past week and are to be turned out in pairs in Tulare, Alameda and Marin counties for the purpose of stocking the woods.

New Incorporations.

The following companies have filed certificates of incorporation at the County Clerk's Office in this city: **MANSTEIN G. M. Co.**—Feb. 4. Location: Kelsey Mining District, El Dorado county. Capital stock, \$300,000, in 30,000 shares. Trustees: George E. Hinckley, George A. Gates, W. W. Higgins, J. Ellis Hill and Wm. Small.

"WINE DEALERS' GAZETTE" Association.—Feb. 4. Object: To publish a newspaper called the Wine Dealers' Gazette, and to do general printing and publishing business. Capital stock, \$100,000, in shares of \$1,000 each. Directors—M. S. Whiting, Charles Hosmer, Wm. M. Hussey, Warren Loud and R. G. Reney.

Meetings and Elections.

MARIPOSA M. Co.—The New York Times of the 25th ultimo, says: "The Directors elected at the annual meeting of the Mariposa Land and Mining Company were F. B. Wallace, Chauncey Vibbard, George W. Butts, Ludlow Patton, Mark Brumagin, and the officers, Mark Brumagin President; George W. Butts, Vice-President; F. B. Wallace Treasurer."

CALIFORNIA POWDER WORKS CO.—Feb. 5. Directors—J. H. Baird, (President), J. B. Haggis, J. O. Earl, G. J. Lawton and W. G. Kittle; John F. Lohse is Secretary and Treasurer.

WELLS, FARGO & CO.—Feb. 5. Directors—Lloyd Tevis, W. G. Fargo, A. H. Barney, D. P. Cheney, D. O. Mills, Leland Stanford, J. B. Haggis, Oliver Eldridge and Mark Hopkins.

One of the Old Churches.

We sometimes like to linger along the great highway of life and if possible, here and there gather and garner up one of the rapidly paling leaves of history. And though they appear to be in temples of rock, reared by the hands of men, they are still but frail records of the past, perishable, mouldering leaves of time.

In fancy we can call up the history and condition of the beautiful valley of San Xavier Del Bac, one of the earlier homes of the Jesuit Fathers, in Arizona; its beautiful groves of olives, palms, orange and fig trees, and gleaming in the sunlight, the gilded domes of the magnificent church of that ancient and holy order; but it would be only fancy; for though hardly more than a century has passed since its loveliness was the historian's and even the poet's theme, now all is barren and desolate.

The coil once teeming with all the wealth of forest, fruit and flower, now only reflects from its parched and seared surface, the dancing and dazzling rays of a tropical sun. The glory of its irrigating aqueducts has departed and only the ruins of what was once the grand Church of the Mission, remain as a shattered and torn leaf to record the place of early, laborious, but for the time being, successful missionary labor.

The Poison-Oak and its Antidote.

In the woods and thickets of California, as well as on the dry hillsides, and, in fact, in every variety of locality, may be found a very venomous shrub—the "poison-oak" or "poison ivy;" the *hiedra* of the Spanish people—the dread of all those who are acquainted with it. This plant is known scientifically as follows: it belongs to the natural order *Anacardiaceae*, and is called *Rhus diversiloba* by Torrey and Grey; *Rhus lobata*, by Hooker; and *Rhus toxicodendron*, by Hooker and Arnott. It is similar to the poison ivy of the Atlantic States (*R. toxicodendron* Linnaeus), both in its appearance and in its poisonous qualities. But it is unnecessary for me to describe it, even popularly; for it is unhappily familiar to all, and I will only remark that, although generally a small shrub, the trunk sometimes attains the diameter of six inches, and the whole plant climbs over some large tree for support. The finest specimens that I have ever seen were in an oak and laurel grove, on the road south to San José.

I do not need to describe the cutaneous disease that is produced by contact with or approach to the poison-oak. And it is hardly necessary to advert to the fact that this poison is the cause of a vast deal of misery and suffering in California, and that there is scarcely ever a time in any little town or neighborhood when there are not one or more persons suffering from it. Farmers and laborers are especially liable to this poisoning, and besides the suffering and annoyance caused by it, the loss of valuable time is no small item to be taken into account. Truly he who makes known a prompt and sure antidote to this poison will be a public benefactor; and this communication is made to the public with the confident expectation that the remedy here described will prove to be such benefaction.

The remedies in use for the effects of the poison-oak are quite various, and some of them will cure the milder cases. Of all the common remedies, the warm solution of the sugar of lead has within my experience been productive of the best results. The water of ammonia, warm vinegar and water, the warm decoction of the leaves of *Rhamnus oleifolia* ("Yerba del Oso," of the Californian-Spanish), or even pure warm water, are sufficient sometimes to produce a cure. All these remedies are, of course, applied externally by way of washes to the parts affected. But the only remedy that I have found invariably successful as an antidote for this poison, is an indigenous plant growing very abundantly in this vicinity (Monterey), and in other parts of the State. It is a tall, stout perennial, belongs to the composite family, and looks like a small sunflower. It is from one to three feet high, has bright yellow flowers in heads one or two inches in diameter (and as I have said), like small sunflowers, flowering from June to October. Before flowering, the unexpanded heads or buds secrete a quantity of resinous matter, white and sticky, like balsam, that is finally, after the flower expands, distributed over the petals, etc., of the flower like varnish. The whole plant—flowers, leaves, and all, is resinous and viscid. When it grows on dry hills, it is stiff and rigid, with narrow, thin leaves; but in damp localities it is more robust and succulent, with wide, fleshy leaves. Its botanical name is *Grindelia hirsutula* and *G. robusta*; but I have not been able to find more than one species, and all the different forms possess the same remedial virtues.

The mode of using it is as follows: Bruise the fresh herb and apply it by rubbing over the parts affected; or, boiling it in a covered vessel, make a strong decoction of the fresh or dried herb, with which to wash the poisoned

surfaces. Its remedial properties appear to be contained chiefly in the resin or balsam-like juice of the plant, which is particularly abundant on the surface. One application is sometimes sufficient for a cure; but if the disease has been of long duration, several days will elapse before relief is obtained. This plant is a remedy for the poison-oak, used originally by the Indians of this vicinity, and by them its virtues have been communicated to the Spanish-Californian people, who are now commencing to use it.—C. A. Canfield, M. D.

Resources of Utah.

We continue these excellent articles from page 66, from the Salt Lake Tribune:

Mining Districts.

The principal mines in main Bingham are the Winnemuck mine and tunnel, with three

Crosue, Last Chances and many others.

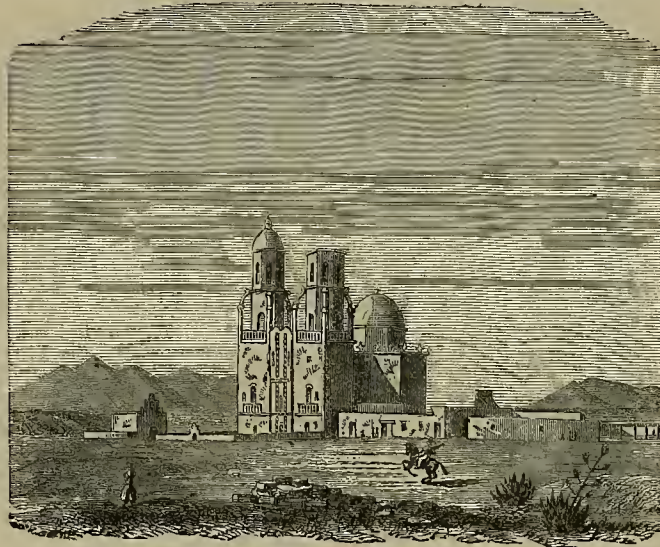
Rush Valley District.

In Tooele county, is situated on the west slope of the Oquirrh range of mountains, forty miles southwest from Salt Lake City, on the overland stage road.

The district was located in June, 1864, and the city of Stockton laid out in the same year. Immediately after the discovery of mines was made, a good deal of capital was invested to aid in developing them.

The principal lodes of the district embrace the following: The Silver King and West Extension, Silver King No. 2, and on the east end the Bolivia and Tucson. The Pleasant Hill, Last Chance, Defiance, Potomac, Eureka, Quandary, Vulcan, Metropolitan, Legal Tender, St. Patrick, Great Basin, Our Fritz, Mineral Hill, Peahody, May Bell, Lady Douglas, Great Central and Silver Queen.

The description of ore is argentiferous ga-



MISSION CHURCH OF SAN XAVIER DEL BAC.

smelting furnaces, recently sold to a European company. The West Jordan, Kenosh, Galena, Orphan Boy Consolidation, Vespacon, Sultana, Elizabeth, Northern Light and Fairview, also, the Red Warrior, Dartmouth, Portland and Belshazzar belonging to the Utah Silver Mining Company of London, who have smelters and roasters attached. Also, the Kelsey tunnel, located in a belt of oxides, ten in number, owned by the Kelsey Tunnel Silver Mining Company. This tunnel is already worked some 350 feet into the body of the hill, and has crossed two of the veins six feet and nine feet in thickness.

On Silver Hill also, in Main Bingham, are

lena and carbonate of lead, carrying from 50 to 60 per cent. of lead and from \$25 to \$125 in silver per ton of ore. The ore is considered to be first-class for smelting.

The Ophir District

Was formerly part of the Rush Valley District, and was organized in June, 1870. It is distant fifty-five miles from Salt Lake City, and is celebrated for the richness of its mineral veins. The principal mines in the district may be classified as follows:

EAST CANON,

On the northeast side of the cañon, known as Ophir Hill, Miner's Delight or Blue Monster,



LEAF OF THE POISON-OAK.



POISON-OAK IN MINIATURE.

the Spanish, the Queen and Bukeye mines, lately incorporated in New York with a capital of \$500,000.

In Bear Gulch placer claims are worked.

On the divide between Main Bingham and Butterfield Cañon is the Eagle Bird, a mine of great promise, and to the left the Yosemite and Telegraph mines, the latter shows large bodies of carbonate ores in all openings upon it.

In Butterfield Cañon are the Oceola, the Lucky Boy and the Bemis and Hiatt, all well developed and valuable mines.

In Spring Gulch are the Greeley and Royal lodes, also the Legal Tender, all of them bearing ore of a high grade and milling character. In Carr Fork the Nahoh, White Pine and Clipper.

In Muddy Fork the Saturn, Last Chance and Greens.

In Markham Fork the Washington, Oro and others.

This district is one of great promise, and well deserving of attention, its accessibility at all times of the year, the early completion of a railroad connecting it with the Utah Southern Railroad, and the promising appearance of such mines as the Winnemuck, Northern Light, Fairview, Orphan Boy, Lucky Boy, Telegraph,

Poor Man's Friend, Bath, Buckhorn, Keystone, Fairview, McCullom, Hidden Treasure and Grant Tunnel. The ores are carbonates, chlorides and galena.

ON SILVERADO HILL

Is the famous Silveropolis mine, from which such rich specimens have been extracted, and also the Shamrock, (the ores of which have assayed so high).

LION HILL.

On the west side, or Lion hill, are the Mountain Lion, Mountain Tiger, Zella, Snnnyside, Silver Chief, Silver Exchange, San Francisco, Defiance, Valley Tan and New York.

The character of ore is chlorides and rich sulphurets, with but little lead and some antimony.

CHLORIDE HILL.

On this hill the best developed mines are, San Joaquin and Chloride Jim. The ores are principally chlorides on this hill.

FOOTHILLS ON EAST CANON.

The Green Chloride and Philadelphia groups of mines are located here. The ore is high grade, and rich in chlorides and sulphurets.

DRY CANON.

On the East side, known as "Jacobs" and

the Snow Storm hills is the celebrated Mono mine which carries so large a percentage of gold in its ores; also the Congress, Utah, Queen, Miami, Ida Edna, Wild Tiger, Chance, Kearsarge, Magnolia, Fourth of July, Alabama, Wandering Jew, Scottish Chief and Evening Star.

The ore are high grade, sulphurets, bromides, with but little lead. On the

FOOT HILLS

Are the Rip Van Winkle, Baltic, Lowland Chief, and Green Chloride Flat mines. The ores are high grade argentiferous.

There is a fair division of ores in the district—one half being milling and the other smelting. The former are on the West side and the latter on the East side.

Camp Floyd District

Is situated on the western slope of the same range of mountains, about 60 miles distant from Salt Lake City. It was organized early in the Spring of 1870.

The principle mines in the district are the Silver Cloud, Sparrow Hawk, Comstock and Mineral Point.

The Sparrow Hawk is owned by an English company. There is a 20-stamp mill belonging to the property.

Other mines are partially developed and give good promises, among them are the Mormon Chief, Queen of the West and Elkhorn.

The ores of this district are chiefly milling, with general combinations in connection, considerable horn silver occurring. The lodes are principally stratified, and occur mostly in limestone formation.

A second mill is in process of erection at Fairfield on the road from Lehi to Eureka, about seven miles from Lewiston, for the purpose of working custom and purchased ore; the owners of the mill are mostly interested in mining claims in the district. Cinnabar has been discovered in the district and a recent assay showed 5.24 per cent. in quicksilver.

East Tintic District

Is situated in Tintic valley, about 74 miles southwest of Salt Lake City. The core of the upheaval, traversing Utah from northeast to southwest, runs through this district, flanked on each hand by lime formations.

The district was located in the fall of 1870. Following are the names of the principal mines:

EUREKA CITY.

The Eureka, an extensive, valuable and well developed mine, with smelting works attached. And midway between

EUREKA AND SILVER CITY

The Mammoth and the Mammoth Copperopolis are situated, and the latter is owned by an English company. This mine is at the present time the leading one of the district. The preparations in the shape of buildings and accommodations for an extensive mining business are on a grand scale. The ore from it yield a large percentage of copper, silver and gold and the return of shipments to Swansea have averaged in some instances from \$200 to \$300 per ton.

In consequence of the prevalence of silver ore, in many cases with free gold visible, it is contemplated to erect a mill, and a location has been secured at a comparatively short distance from the mine and work is expected to commence at an early day. On the dump there are several hundred tons of good milling ore.

In addition are the Swansea, Chicago, Diamond and North Star, the Highlander Consolidation, comprising the Highlander; Highland Lass, Helena, Josephine and Storm King lodes, also the Empire Tunnel.

There are also the Black Dragon and Snnnham mines. Contiguous to

DIAMOND CITY

Are the Joe Bowers, Shower, Morning Glory, the Diamond Silver Mining Co's group, the Joe Lane, Norwegian and Rising Sun.

The ores in this district are principally milling, with occasional smelting. The greater part of the body of ledge matter is quartzite, containing the chlorides, carbonates and sulphurets of silver, with argentiferous lead, in some instances, also frequently a considerable percentage of copper and some gold, as for example in the Mammoth and Copperopolis lodes.

The veins or lodes are mostly of a fissure character, and are found in limestone, quartzite, porphyry and granite.

About six miles in a westerly direction from Diamond and Silver Cities a new stamp mill is being constructed by a California Co., on what is known as Tanner's Ranch. This mill is expected to be completed and in operation early next spring. The movement will greatly facilitate mining operations in that district.

Ohio District.

This district, commonly known as the Sevier District, is on the Sevier river about two hundred miles below Salt Lake City. It was organized in 1869. The principal mines are the Webster and Bully Boy, both of which have very large surface showings.

There are also the Yankee Blade, Eclipse, Morning Star, Niagara, Rothschild, Great Western and Gould & Curry. The ores of this district are free milling.

Lincoln District.

Formerly called the "Pioneer," is situated four miles north of Minersville, Beaver county, and about two hundred miles southwest of Salt Lake City.

The Pioneer district was organized in 1864, and its name changed to Lincoln District January, 1871.

In this district the Mormons commenced

working the old Spanish lead mine as far back as 1554, which has since been named the Rollins lode.

The other principal mines in this district are the Quinoy, Alameda, Wahsatch, Lewis, Grundy, Creole, Galena and St. Cloud.

The ores of this district are principally Galena.

Salt District,

230 miles south of Salt Lake City, was organized in the fall of 1870. There is a plentiful supply of wood and water for mining and domestic purposes. The principal mines are the Taylor, St. Mary, Maxwell, Mars, Pitney, Pacheco, Rubie, Frank, Bibbins, Harrisburg, Gus Gates, Tiger, Rhine, Wilber, Elephant, Jupiter, Big Mormon, Sbauteer, Flora, Temperance, Empire, Washington, Hickory, Rebel, Shenandoah and Hope.

The ores are principally of a milling character.

Mineral Point District

Is situated 16 miles from Brigham City and distant 18 miles from Brigham, on the Utah Northern Railroad. This district is receiving much attention from capitalists on account of the immense deposits of iron, which mineral is pronounced better than that found in Lake Superior, the appearance and analytical properties being very similar. The Idaho iron mine shows large bodies of rich iron ore, and is the only mine on which developments have been made to any extent.

The foregoing comprises a list of the leading developed mining districts. Some recent and valuable discoveries have been made, and districts organized in other portions of the Territory, which are in process of development, and will, in due course, take their rank among those of acknowledged value and importance.

Among the latter may be named the

Granite District,

Sixty miles west of Ophir district, organized in the summer of 1872.

The formation is granite, and the croppings stand boldly out and can be traced in some instances over 1,000 feet.

The ore carries much iron, with galena and copper and iron pyrites; also, fine matrix quartz.

Beaver Lake District,

About 25 miles south of Salt Lake City, is a promising district. Four mines are in process of development, viz.: The San Francisco, Fairview, Big Mountain and Teemseh.

The character of the ore is galena, chloride, black sulphurets, carbonate, and occasionally horn silver is found in limited quantities.

Still further north are the North and South Star, and the San Francisco districts, all spoken well of, but not yet sufficiently developed to warrant the details concerning them.

USEFUL INFORMATION.

Philosophy in Extinguishing Fires.

It has been remarked that while fire apparatus has been constantly improving, no progress has been made in the method of attacking a fire. On this point, Rev. Dr. Hill, not long ago President of Harvard College, has this to say:

Nearly everybody is in daily need of kindling fires; but few have ever need of quenching a fire. Hence most people know that fire spreads by heating adjacent fuel, and that, in heating adjacent fuel, the heated air and burning gases of the fire are much more efficient agents than the radiant heat; in other words, that to get a fire to spread rapidly it must be lighted at the bottom or to windward, or where a lateral draft may be created by the fire; while few people know that to quench a fire the same principle is generally available, and the quenching is most rapidly effectual if it can be begun at the lower part of the fire or at windward, or where a draft strikes it.

"Of course in a great conflagration it is often impossible to avail oneself of these facts, but at the beginning, while the fire is confined to one or two houses, it can generally, unless there be gunpowder or benzine in the building, be subdued by a resolute plucky adherence to the maxim 'Play low.' When a building is well on fire and pouring a stream of flame and burning cinders out of its roof, the temptation to play on the roof is very great, and a majority of firemen yield to it; but the minority who resist the temptation, and direct their streams into the lower story of the building, presently have the satisfaction of putting out the fire. If the gas pipes under a mass of burning ruins be open or broken, the effectual remedy is to shut off the gas in the main pipe. The blazing roof is the burning gas, the gas is generated from the heated timbers, the heat generating it is from the burning stories below, the wind currents carrying the blazing cinders to adjoining roofs are produced by the same heat below; quench that lower story, and you have put out the fire at the gas factory and cut off the supply of gas, and the steam from that quenching has also gone up and deadened the fire even to the roof.

TAME CODFISH.—Mr. Buckland, in a recent number of *Land and Water*, gives an interesting account of a visit paid by him to a pond containing tame codfish at Port Logan, Wigtownshire. The property in question belongs to a gentleman by the name of McDougall, and consists of an amphitheater about one hundred feet in diameter hollowed out of the solid rock by the sea. All egress from this is prevented by a barrier of loose stones, through which water passes freely. On approaching the shore of the pond many codfish of great size were seen; and when a servant woman who had charge of the fish approached with some mussels; the surface of the water was perfectly alive with the struggling fish. They came close to the edge, and after a little while permitted Mr. Buckland to scratch them on the back, and play with them in various ways. Among other experiments tried by him was that of holding a mussel in his hand, and allowing the fish to swallow his hand in the effort to obtain the mussel. These fish furnish to the proprietor an ample supply of excellent food, the flavor being considered much superior to that of the cod taken in the open sea. Whenever needed for the table, a selection can readily be made from the most promising of those on hand, and the fish secured without any difficulty.

To PRESERVE POSTS.—A writer in the *Western Rural* says: "Take boiled linseed oil and stir in pulverized charcoal to the consistency of paint. Put a coat of this over the timber, and there is not a man who will live long enough to see it rotten. I discovered many years ago that wood could be made to last longer than iron in the ground, but thought the process so simple and inexpensive that it was not worth while making a stir about it. I have taken out basswood posts that have been set seven years, that were as sound when taken out as when first put into the ground. Time and weather seemed to have no effect on them. The posts can be prepared for less than two cents apiece. They should be well seasoned before the oil and charcoal are applied."

TEA IN IOWA.—Iowa is jubilant, for within her borders a new agricultural treasure hath arisen. This is tea, which has been cultivated in Crawford county up to the point of 700 pounds to the acre! It is said that the person in charge of the plantation, after making many experiments in many States, found that the climate and soil of Iowa best suited the plant, and that it would and could endure thrivingly the coldest of her weather. No wonder the State is jubilant. We await with interest, for further developments, well assured that if tea can be grown with profit in Iowa, we shall by and by make a good business of it in California.

DICKENS'S AMERICAN READINGS.—By far the most profitable lecturing tour on record is that made by Dickens in this country, from Dec. 24, 1867, to April 20, 1868, in which time the great novelist gave 76 readings, to audiences averaging 1,500, the average net proceeds amounting to \$3,000, giving him a fortune of \$228,000 in what may be regarded as a simple holiday excursion of five months. His smallest house was at Rochester, which gave him \$2,500, while his largest house yielded him \$6,000. Mr. Dickens was listened to in America by 114,000 people. Who wouldn't be a reader?

TO PROTECT LEATHER FROM THE ACTION OF AMMONIA IN STABLES.—Long continued observations show that harness and other leather exposed to the action of ammonia continually given off in stables become weak and rotten sooner than other leather. Even when care is taken to protect them with grease this takes place. Prof. Arles recommends the addition of a small quantity of glycerine to the oil or fat employed in greasing such kind of leather, assuring that it keeps it always pliable and soft.

MEASURING THE HEIGHT OF TREES.—When a tree stands so that the length of its shadow can be measured, the height of the tree may be readily ascertained as follows:—Set a stick upright near the termination of the shadow of the tree. Mark the extremity of the shadow of the stick and also of the tree. Then as the length of the stick's shadow is to the length of the stick, so is the length of the tree's shadow to the height of the tree.

A GIGANTIC NETTLE.—They have a stinging nettle in Australia, which grows 40 feet high, and has a stem over two feet in diameter. By the way, we believe no botanist has yet been able to make it clear what office the nettle has assigned to it in the economy of nature, or why it is guarded with fine needles, as though more precious than other plants. As nothing was made in vain, a purpose was certainly contemplated. What is it?

ONE POUND OF TEA contains about a third of an ounce of theine, two and a half ounces of caseine, one twelfth ounce of volatile oil, and two and a half ounces of gum, half an ounce of sugar, half an ounce of fat, four ounces of tannic acid. Mineral matter or ash, water and woody fibre make up the remainder.

HERE AND THERE.—A comparison of the extremes of noonday temperature in Philadelphia and San Francisco during the month of July, brings out with great clearness the remarkable uniformity of the California climate. In Philadelphia these extremes were 69 and 98 deg., while in San Francisco they were 60 and 69 deg.

WATER IN FRUIT.—Apples, pears and peaches contain eighty-two to eighty-six per cent. of water, and most other fruits nearly the same. Grapes contain nearly twice as much as currants, three times as much as raspberries, five or six times as much as apricots and peaches.

GOOD HEALTH.

How a Man Feels when He is Full of Strychnine.

Dr. Harris, an assayer residing at Gold Hill, Nev., recently came very near being poisoned to death through taking a dose of medicine for rheumatism. The following communication from him tells the story: Last night I felt a pain in my knee, caused by rheumatism. I got up at 10 o'clock and took a dose of rheumatism medicine prescribed by Dr. Toland of San Francisco. There was only one dose left, and not at the time thinking of the sediment at the bottom of the vial, I took it. Half an hour after, as I was lying in bed with a candle in hand reading, I was struck senseless and speechless.

The candle fell on the bed, and I could neither stir nor cry out for a second. Luckily the shock terminated in time to let me put out the light, or the house and all would have been consumed. More and stronger shocks and convulsions then followed, and from the symptoms I knew that I had taken strychnine. My wife brought sweet oil, of which I took two doses. But great God! what a torment! Shocks and convulsions followed from half-past ten to twelve o'clock, when the death throes set in. I was convulsed, and felt five shocks like a man broken on a wheel, and the last shock made me helpless and stiff. I felt the earth give way, and called my wife to me.

My hands were crossed, but I could not move them, nor any part of my body. I bade them all good-by and swooned. My wife sent the children for a doctor, and Dr. Kirby came about 12 and found me still alive and somewhat rational, as the oil had its effect. From then until 6 o'clock this morning I had shocks like from a galvanic battery every few minutes. I could not stir hand or foot, and any attempt to turn my head brought a shock. To tell what I suffered is impossible, and I had given up all thoughts of life; but soon I began to recover; and now, 10 o'clock A. M., I am able to write you this, in order that you may warn persons using this medicine to beware of overdoses or settings.

Broken Hearts.

The advances of pathology demolish for us some of the most beautiful illusions of ancient times. The heart, for instance, is degraded from its position as the high altar of devotion and affection, to a mere hydraulic machine. The liver no longer plays its old role in melancholy, to which it gave the name. It makes simply some bile and some sugar. The eye, after all, is only a system of lenses, and refracting media of different densities, and so on, of all the rest; but in the course of still further and more extended observation became evident the close connecting links between these organs and the presiding brain, which explains to us the intimate relationship which exists between heart; expression then still lingers in the eye; hypochondriasis still has its frequent seat beneath the cartilages of the ribs, and the heart still throbs and palpitates under the various emotions. Bernard has explained to us in detail the full significance of the cold and empty heart, the heart that is light or heavy, the heart that is full to bursting, and last of all, the heart that breaks outright. The great batteries of the cerebral mass send special lines of innervation to the heart, and though the communication between the heart and brain are not so swift—being only at the rate of 112 feet per second, as electricity, yet its force and volume are even more intense. The broken heart, then, is no mere poetic fiction, and several instances are recorded where rupture of its strained or more especially diseased fibers, has taken place under powerful mental emotion.

THE CUTICLE OR SCARF SKIN.—As the scarf skin has no blood vessels running into its substance it has no means of self-repair; so that in proceeding from the deeper layers to the surface the cells go through all the processes of birth, death, decay, and dissolution, though the membrane is so thin. Since, also, this skin has no nerves entering it, it has no sensation, and the sensation of touch must be felt through it in the same way—though in a much more perfect manner—as we feel anything which touches us through our clothing. It will be seen, then, that it must fit very accurately and closely to the sensitive skin beneath, or the sense would be dull and imperfect. The skin below has an immense number of small hillocks, and each one of these is closely surrounded by, and inclosed in, the inner layer of the cuticle which is moulded upon them. When the cuticle is stripped off, after being long soaked in water, it shows an infinite number of small pits, out of which the hillocks or papillae have been dragged. If the whole be torn away before maceration—i. e., from the living skin—it usually tears away the papillae with it, leaving a bleeding surface.

FLIES CONVEY INFECTION.—Professor Kletinsky, of Vienna, is reported to have microscopically detected epithelial cells and pus-globules adhering to the bodies of flies which had lit on small-pox patients, thus justifying the belief that these insects may convey infection.

Drinking too Much the Cause of Kidney Disease.

Five-sixths of an animal body is made up of water. A man weighing two hundred may be dried into a mummy not weighing but sixteen pounds, including bones of the skeleton. Water, therefore, is largely employed in giving form, flexibility and beautiful lines. Enough is taken in with food to meet all demands of the system. The precise quantity, and indeed quality, is regulated by a sense of thirst. But that vital sentinel may be corrupted by excessive indulgence. When simply water is taken, a morbid thirst never follows. If, however, stimulating fluids are swallowed a morbid craving may be generated, which if not restrained, may become an unsatisfied passion, to the positive injury of organs on the regular functions of which sound health depends.

There is danger from indulging in artificial drinks. Nature distills them over in the stomach by her own chemical process, separating the water from them, which is used for legitimate purposes, but rejects all the rest, throwing it out of the body through the kidneys and skin. By working the renal apparatus beyond a normal gauge, to carry off offending elements, they fall into disease beyond the resources of medicine.

This explains a prodigious advance of Bright's disease—that is, a degeneration and loss of ability in these organs to do what they must accomplish for stability in health. None of the lower animals have kidney diseases, because they never drink to excess or burden the stomach with compound beverages.

Sir William Gull on Typhoid Fever.

In a recent lecture on typhoid fever at Gny's Hospital, Sir William Gull remarked that two hundred and fifty years ago one of the kings of England died of ague, but now by improved agriculture and drainage the disease had become rare, and certainly very few die of it. Typhoid fever, he asserts, is as preventable as ague, and two hundred and fifty years hence deaths from it will be as rare. The disease is caused by a virus of nature, which may get into the healthy body, increase in it, and destroy it. It is an accidental condition, and not one of the ordinary processes of nature. The origin of the disease is somehow or other connected with drainage; it has therefore been called the filth fever, and to get rid of the filth is to get rid of the fever. This was illustrated in the case of the Milbank prison, where typhoid and dysentery were once thoroughly established, but where both almost wholly disappeared when the water-supply was changed and efficient drainage provided. In his closing remarks on the treatment of the disease, the lecturer said that no one can approach a case of typhoid fever without paying some attention to hygiene. This he claimed was of the greatest importance, and with it he would prefer to carry any one through the disease by wines and soups and fresh air, rather than by the use of drugs.

BURYING ALIVE.—A Paris paper challenges the world to produce one authentic case where a person has ever been buried alive. It adds that such stories are all bosh. Notwithstanding the above, we are inclined to believe that persons have, not unfrequently, been consigned to the grave before life was extinct, though the number of cases in which this has been done are probably very much fewer than is generally supposed.

A German physician recommends that whenever there is any doubt in regard to life having departed, that a string should be tied tightly round a finger or a limb of the person supposed to be dead, when, if life is absolutely extinct no change whatever will take place, but if there is the slightest vitality remaining, the flesh above the string will become a bluish red, being surcharged with blood, carried to it by the arteries, and which the string prevents the veins returning to the heart.

LIE DOWN AND REST.—Dr. Hall says the best medicine in the world, more efficient in the cure of disease, than all the potencies of the materia medica, are warmth, rest, cleanliness and pure air. Some persons make it a virtue to brave disease, to "keep up" as long as they can move a foot or crook a finger, and it sometimes succeeds, but in others the powers of life are thereby so completely exhausted that the system has lost all ability to recuperate, and slow and typhoid fever sets in and carries the patient to a premature grave. Whenever walking or work is an effort, a warm bed and a cool room are the first indispensable steps to a sure, and speedy recovery. Instinct leads all beasts and birds to quietude and rest, the very moment disease or wounds assail the system.

SASSAFRAS LEAVES FOR BOILS.—Seeing a friend sorely afflicted with boils a few days since reminded us of the Sovereign virtue which sassafras leaves, pounded into a sticky paste and applied as a poultice, possess. The writer has tried the remedy on his own person and applied it to persons of others in many instances, and never knew the poultice to fail in drawing the most obstinate boil to a "head" within twenty-four hours. I am aware that the sassafras tree is rare in California, but that is no reason why any nurseryman should not introduce it, and our people cultivate it extensively. The bark of the root is an article of commerce and the tree is useful and ornamental. H.

MINING AND SCIENTIFIC PRESS.

B. EWER, SENIOR EDITOR.

DEWEY & CO., Publishers.

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San Francisco:

Saturday Morning, Feb. 8, 1873.

Legal Tender Rates.—S. F., Thurs., Feb. 6.—buying 88½; selling 88½.

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Death of Professor Rankine.

The well-known and eminent, mechanical and scientific engineer, Prof. W. J. Macquorn Rankine, died at Glasgow, Scotland, January 24th, after a brief illness. Only two or three hours before his death he penned a brief communication to the monthly meeting of the Institution of Engineers. He died of heart disease. Dr. Rankine died in the prime of life, having only reached his 53d year. He has been a hard thinker and worker, and his death was no doubt hastened by his unceasing labor. He was a man of wonderful intellectual attainments, and few who have ever lived have been able to get through with such an immense amount of study and work as was his daily practice. His acquaintance with the literature of physical and mechanical science was perfectly marvelous. The contributions to science which he has left are ample to secure for his name an imperishable record, as one of the foremost of modern philosophers.

WHITE FISH.—We have received from Kelloggville, Lake Co., a note from Mr. Livingstone Stone, in relation to the experiment of introducing the White-fish of the great American lakes to the lakes of California. He says: "The hatching works for the State, White-fish eggs, at this place, are completed, and are well located. I am expecting the eggs every day. The United States will present the State Board of Commission with 400,000 ova, which will be placed in Clear Lake, when hatched."

We hope a portion of these will be put into Lake Tahoe, a much larger, deeper and colder body of fresh water than Clear Lake.

HORSE DISEASE.—A correspondent of the Salt Lake Herald at Little Cottonwood says the epizootic will have a serious effect on the mines, and will be the means of stopping the regular monthly dividends of the Flagstaff and Emma.

TERRIBLE EXPLOSION.—By the simultaneous explosion of four boilers at the American Iron Works, Pittsburg, Pa., on the 3d inst., seven men were killed and over thirty wounded.

Proposed Mining Legislation.

Coal Lands.

A bill has been introduced in the House of Representatives by Mr. Kendall entitled "A bill to encourage the discovery, exploration and working of coal veins or beds upon the public lands of the United States," and provides for the purchase of coal lands by the discoverer at the rate of \$5 per acre. The maximum area of land to be embraced in the claims is limited to 160 acres for one person and 640 acres to any association. If the lands are not paid for in one year from the date of the location they are subject to relocation. The bill has not yet become a law. As the law stands now no matter who the discoverer may be, the lands must be put up at public auction and sold to the highest bidder. The Nevada people wish that exceptions be made in the case of their State and a resolution has been presented to the Legislature asking it to memorialize Congress to except Nevada from the operation of the law now in force. The memorial has been published in the Territorial Enterprise and it is hoped that proper attention will be paid to it. It represents that on account of the increasing scarcity of wood for fuel in Nevada, particularly near the Comstock mines, unless relief be found by the development of coal mines within the State, gold and silver mining will be seriously embarrassed, and attended with expense rendering the working of low grade ores unprofitable. That on account of the existing laws previously referred to, prospecting for coal has almost entirely ceased, since the discoverers have no more right to the locations than any one else, as the lands are sold at public auction at a minimum price of \$20 per acre. The memorial asks that the laws shall be modified so that the discoverers can pre-empt and purchase. Mr. Kendall's bill, if passed in the Senate, will cover all this ground.

There is no place on this coast where a good supply of coal is needed as much as at the Washoe mines, for the wood is very scarce. Nearly 600 cords a day are shipped from Carson to points on the Virginia and Truckee Railroad, which barely suffices to keep the mills and hoisting works running. The Gold Hill News says that the Ophir hoisting works consume 13 cords a day, or 4,750 cords per year. The Gould & Curry burns 16 cords a day, or 5,840 per year, and other hoisting works in proportion. They are now adopting the plan of using wood and coal together which is said to effect a considerable saving of the former. Now that Utah is turning her attention to coal mining she may be able to supply the deficiency, but if the laws referred to above, are passed, prospecting in Nevada will commence and the latter State will probably be able to produce enough for home purposes. Storey county alone will use about 300 tons a day. Utah is the richest in coal of any of the adjoining Territories as far as known, but Nevada may be able to compete with her, in this respect, if the country is fairly prospected.

"The Protection of Miners."

The bill introduced in the Nevada Legislature by Senator Phelan for the "Protection of Miners," and now before the Committee of Mines and Mining, is given as follows in the Enterprise:

SECTION 1. Whenever complaint, duly verified by oath of complainant, is presented to a District Judge, setting forth that the lives, limbs or health of the miners working in or about any mine, within the judicial district, are exposed to unnecessary hazard by reason of inefficient or defective machinery, want of proper ventilation, the storing of powder, or erection of steam engine or privy in the mine, or from any other cause whatever, the District Judge shall appoint some competent person as commissioner to examine such mine.

SEC. 2. The commissioner shall proceed at once to said examination, and report, in writing, to the District Judge forthwith, the result thereof. If said commissioner shall find the complaint true, or shall find that the lives, limbs or health of such miners, aside from that set forth in the complaint, are subjected to unnecessary hazard, he shall suggest in his report the most expeditious and cheapest mode of correcting the evil, and the District Judge shall, by written order, directed to the owner or owners or the agent in charge of such mine, require the correction of to be corrected in the manner set out in said report.

SEC. 3. If the owner or owners, or the agent to whom such order is directed, shall fail to comply with such order as soon as practicable, he or they shall be fined by said judge in any sum not less than one hundred dollars nor more than five hundred dollars.

SEC. 4. The commissioner shall be allowed the sum of twenty dollars for each examination and report, to be paid by the owner or owners of such mine, in case the commissioner shall find just cause of complaint; otherwise his compensation shall be paid by the complainant or by the county, as may be directed by the District Judge.

SEC. 5. If the District Judge shall find that the complaint is presented in bad faith, or malice, he shall fine the complainant in any sum not less than twenty-five dollars nor more than one hundred dollars.

SEC. 6. The sheriff of the county shall execute all orders of the District Judge, and all orders shall be enforced, and all fines collected as provided by law for the enforcement of orders of courts of justice and the collection of fines.

It ought to be to the interest of large companies to provide proper means of exit in

case of fire, ventilate the mine, store the powder safely, and keep their hoisting works, etc., in a proper condition without being compelled by law; and in fact most of them recognize this, if not for common humanity's sake, for the reason that they do not wish to be held liable for damages. The engineers have to trust their own persons in the mine and to their machinery, and would hardly permit anything dangerous about it if they knew of it, and when such things are pointed out, they have a personal interest in its being promptly remedied. The miners are good judges of danger in their work and would be very likely to complain. Legislation in this case is hardly necessary, but as the Enterprise justly remarks, "while there is no harm in the bill we doubt that its passage would do anything toward furthering the humane purposes of the measure."

Academy of Sciences.

The regular semi-monthly meeting of the California Academy of Sciences was held on the 3d inst., when the following new members were elected: Rev. W. A. Scott, F. H. Waterman, Wm. E. Brown. The Hon. Charles E. De Long, U. S. Minister to Japan and Albert Bierstadt, the artist, were elected corresponding members.

Donations to the Cabinets.

A number of books were presented to the Academy by Mr. Hector, Geologist of New Zealand. A peculiarly made arrow from Kotzebue Sound was presented by Agapin Honehar-enko. The head of the arrow was apparently poisoned; Dr. Dall said they were used by the natives in Alaska for killing seal. They allow a deer's liver to rot, and make from it something which is supposed to be poisonous.

Specimens of ore taken out in the tracing done on account of the lawsuit between the Raymond & Ely and Kentucky mine were presented. They were crystallized carbonate of lead and hydrous oxide of iron. The Frog Found Alive in a Mine.

At Mount Diablo, recently, was presented by Mr. Cornwell, President of the Black Diamond Coal mines. It was a frog, not a toad. The President stated that frequently on former occasions it had been reported that frogs or toads had been found hundreds of feet below the surface alive; but inquiry had failed to ever recover the matrix in which it was embedded, and until such is found, scientific men must think that it either fell down the shaft or was put thereto mislead them. No identified case of a frog having been so found was reported. Mr. Cornwell, who presented the specimen, stated that it was found at a depth of 228 feet in the mine, by the men while engaged in picking, not blasting, and they allege that they picked it out. The frog lived about twelve hours only after it was taken out. When Mr. Cornwell visited the mine two days after, he tried to procure the pieces from which he was taken but did not succeed. The rock is a soft sand rock. The man who found the frog says it was in a solid place that he struck his pick in and out struggled the frog and after a moment moved about in a lively manner.

Professor Davidson said there were no cases where the matrix had been found. A gentleman had told him however, that once in Pennsylvania he had seen a frog taken out and he also seen the matrix.

Mr. Dall called to mind, from the proceedings of a scientific association, some experiments where an English gentleman had tried how long a toad could live in this manner. A slab of stone was taken and a number of holes cut in it and in each was placed a toad, previously carefully washed and weighed to ascertain the exact weight. Then a glass was put over each hole and fastened on with Portland cement. The slab was buried in a garden and not taken up for some time. On being examined it was found that where the cement was perfect the toads were dead. Those in the holes where the cement had cracked were still alive. The slab was buried again and not taken up for three years. At the end of that time three were found to be alive. The holes were examined and it turned out that the cement had cracked in each instance undoubtedly and, perhaps had let in some small insects, for one toad weighed more than when he was put in.

R. E. C. Stearns read a paper entitled "Remarks on a supposed new Alcyonoid Polyp from Burrard's Inlet. This was in reference to "willow wands," or supposed "notocords" of a fish, which was under discussion last year. Mr. Stearns illustrated his remarks with diagrams.

Dr. J. M. Wiley made some remarks on some points of interest in connection with the deposits of auriferous gravel in Placer County, which we will give in a future issue.

W. H. Dall, of the U. S. Coast Survey, presented descriptions of three new species of *Delphinus* from the Coast of California, viz.: *Delphinus Bairdii*, *Tursiops Gilli*, *Grampus Stearnsi*.

Miscellaneous Business.

Dr. Kellogg presented and described new plants as follows: *Grindelia Lilifolia*, or varnish cup, collected by Mr. W. G. Harford, of the U. S. Coast Survey, on Santa Rosa Island; *Lupinus*

Seluhus, or stool lupin, found at Donner Lake; *Lupinus luteus*, or milk-white lupin, collected by Samuel Brannen Jr.; *Lupinus luteolus*, or pale yellow lupin, found by the Doctor on Suñol mountains; *Stephanomeria (?) intermedia*, found at Cisco by Meesre, Brannen and Kellogg; *Pentstemon Kingii*, variety *glauca*, or King's Beard, tongue found by Dr. Kellogg on the Sierras at an altitude of 8,000 feet. *Garrya Veatchii*, collected by the late Dr. J. A. Veatch on Cerros Island.

Iron Sands.

At the last meeting Dr. Stout made some remarks on the iron sands which he presented, and since then Professor Davidson had been examining this sand, and had taken portions apparently non-magnetic, broken them up and found they were still magnetic. He found that nearly all would come to the magnet by being careful and even some of the refuse sand, most of which contained particles of iron ore. He examined some of the specimens from the Chil-eat River, to which he had before referred, and found that they were all magnetic iron. Some of it went as high as 72 per cent. and some as low as 20 per cent. iron. When the lumps were crushed it all yielded magnetic iron, showing that disintegration alone would give the reason of its formation. The Secretary read an extract from an article by T. Sterry Hunt, in the *American Naturalist*, confirming Professor Davidson's remarks as to the formation by disintegration. The action of the waves by virtue of the greater specific gravity of these sands, effects a process of concentration, so that considerable layers of nearly pure black sand are often found on the shores exposed to winds and tides.

Railroad Building.

The San Joaquin Valley Narrow-Gauge Railroad will probably now be constructed without doubt. Articles of incorporation of a company for that purpose were filed on the 3d inst., with a capital of \$1,600,000 in shares of \$100. It is called the San Joaquin and Tulare Narrow Gauge Railroad Company. B. W. Bours is President, and T. K. Hook Treasurer. The Trustees are B. W. Bours, T. K. Hook, George F. Smith, C. M. Grattan, R. C. Sargent, of San Joaquin County; A. Leach, of Stanislaus County; Charles M. Bleir, of Merced County; H. C. Dalton, of Fresno County; R. E. Hyde and E. Jacob, of Tulare County; Ed. F. Northam, of San Francisco. This will be one of the most important roads in the State, and be of the greatest benefit to the localities through which it passes. It is said that subscriptions are coming in at a lively rate and already nearly all the first ten per cent. required by law has been paid in.

Montana is in her turn, beginning to think of building railroads. Her comparatively isolated position has been a great drawback to her progress as all the goods carried there have to be transported for long distances by teams, greatly increasing their cost, and lessening the quantity. The population is small as yet, but with the great mineral advantages of the Territory alone, if proper means of communication were available, her prosperity would be doubled. The people are anxious to have railroad connection with this city and desire a road to connect with the Pacific for that purpose. This company to build a broad-gauge road from Corinne Utah, to Helena Montana, are now making strenuous efforts to commence the work. A bill has already passed the lower House, granting right of way for a road from Helena, to some point on the Pacific road. When the principal town of Montana has direct railroad communication with this city it will be of great benefit to our foundry men and merchants, if proper steps are taken to get the trade of the Territory.

The Pioche Record has private advices from Salt Lake to the effect that parties intend commencing active operation in the construction of the contemplated narrow-gauge road to Elko.

The celebration of the opening of the Utah Northern Railroad to Logan has been interrupted by the storms, the guests being unable to proceed over the line.

An effort is being made by the property owners near Berkeley, Alameda county, to establish a ferry and railroad to run direct from San Francisco via, Jacob's Landing, to the University grounds. The subscriptions are said already to exceed three-quarters of the sum needed.

A project is on foot to build a narrow-gauge road from Contra Costa county to Oakland, which would furnish a direct and economical outlet for the products of the numerous valleys of that county, and of the Mount Diablo Coal mines.

The Marin county narrow-gauge road will shortly be built, as contracts have already been awarded for construction. Ground will be broken immediately and the workmen employed. This road runs from Sausalito northward, and will probably be extended further than is at present anticipated.

Improved Safety Hoisting Cages.

The hoisting works in some of the deep mines on the Comstock lode are not only extensive but very expensive pieces of work. The engines, machinery, etc., are well made, heavy, safe and durable and every care is taken to prevent accidents. The construction of the cages is light and simple, differing from those in use in Europe. There they are arranged to receive several cars either on separate platforms or two or three abreast when the shaft is wide enough. They are very cumbersome, and made of iron, some of two stories high. On this coast we have some of two stories which are in reality only one cage over another. Most of those in use are however only one story high. The cars are loaded and hoisted with their load to the surface, instead of by the old way of shoveling ore into a bucket and hoisting it, as the former method is the most simple and saves re-handling the ore, time and labor. All the Comstock, and the principal mines of the Coast that have vertical shafts use the cage, and with heavy loads of from 5,000 to 8,000 pounds they can hoist from 500 to 1,200 feet a minute. The United States Mining Commissioner in his last report gives a cut and description of a safety cage, an illustration of which will be seen in the accompanying cut. The manner in which the cages, work though simple to those accustomed to them, will be interesting to the general reader.

A compartment of the shaft is fitted with vertical stringers, or guides of wood or iron, extending from the top to the bottom which serve to guide the movement of a platform cage, into which the car can be placed. The platform is fitted with rails the same gauge as the track, and the car is run upon these and secured by bolts. The platform is a little smaller than the compartment of the shaft, and forms the bottom of a framework of iron, by which it is suspended. The frame rises above it on each side and connects with a cross piece above the car, to which the hoisting cable is attached. The platform and frame work together form the cage. By means of projecting ears, or bars of iron or steel rubbers on each side, at the top and bottom, which partly embrace the guides, it is kept from contact with the sides of the shaft, and this slides freely up and down, the only friction is between the rubbers and the guides, and this friction in precisely vertical shafts is of course very slight. The shaft becomes in fact a vertical railway, and is a continuation of the tramways, below uniting them with the distributing tracks above. Trimming and hoisting thus become a continuous operation. A car load of ore is rolled from the levels and drifts to the bottom of the shaft and placed on the platform, the signal is given to the engineer above and the load starts on its journey.

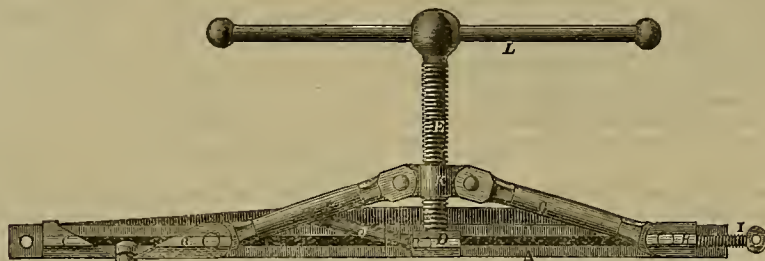
The construction of the cages is very simple, being usually a square plank platform with a track, upon which the car stands, and suspended by a kind of stirrup frame of iron at each side to an arched cross-bar of iron at the top, through the center of which the suspension rod passes freely, and is firmly bolted just below to a second iron cross-bar free to move up and down in slots made in the frame on each side. This second cross-bar is connected at its two ends by arms on the outer side of the frame with the lever ends of dog-clamps or safety catches. The construction will be readily understood by referring to the cut, which gives a side view of the most approved form of the cage and catches now in use in the Comstock mines. The platform *P. P.* is five feet long and three feet eight inches wide. It is surmounted by a hood *H. H.* of boiler iron, firmly secured by binges to the tops of the frame and designed to protect the miners from falling bodies. The height of the cage from the top of this hood to the bottom of the platform is eight feet. The ends of the rubbers are seen at *R. R.* and at *O. O.*; the clamps or safety catches at *C. C.*; and the arms *A. A.* connecting these with a cross piece above, *O. O.*

A safety hook *S.* for detaching the cage in case of over winding, is placed at the top and turns in the head of the suspending rod. When the cage is at rest in the bottom of the shaft, or wherever it is not suspended by the winding cable, the cross-bar *B. B.* and cross-piece *O. O.* are pressed downward by a long and powerful steel plate spring, and this throws the points of the catches *C. C.* into the sides of the guide timber, and not into its face, as is the case with Fontaine's and other safety catches. During hoisting or lowering the spring is compressed and this tends to relieve the cage from the

shock which attends a sudden commencement of hoisting. The hand lever just above the platform controls iron rods which rise through the floor and hold the cars securely in place during the ascent and descent of the cage. This sort of cage is very light and gives general satisfaction. It is not closed in at the top or sides as closely as in the foreign mining cages, and is high enough to allow the men to stand upright. The hood is hinged to prevent the imprisonment of miners in case of accident, or drowning, if, as sometimes happens, the cage is lowered into the sump. These cages are generally hoisted by flat wire rope most of which is made by A. S. Hallidie & Co., in this city. The dimensions of these flat cables are 3 by 1/2 inch to 6 by 1 1/2 inches for iron, and 2 1/2 by 3/4 inch to 4 by 1/4 inch for steel.

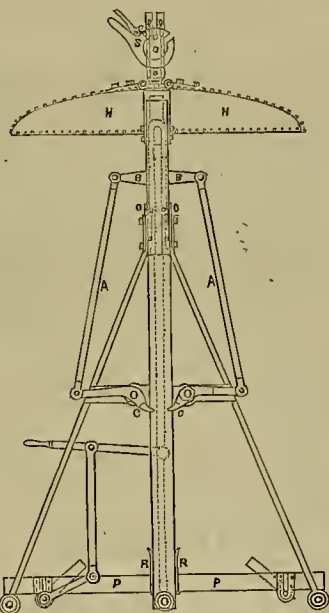
Improved Bolt Cutter.

We give herewith an illustration of an exceedingly simple and effective device for cutting off the ends of bolts or bars in positions where it is not possible to bring the work to a shop, and it is especially applicable to the work of cutting off bolts in various parts of a ship, where they may project too far after fastening. The illustration shows a pair of stout ways, *A*, about two and a half feet long. At one end of these ways a steel cutter, *C*, is secured, and a movable cutter, *B*, slides to and



CHAPMAN'S IMPROVED BOLT CUTTER.

from the cutter *C*, on the ways *A*, the edges of the cutters facing each other. A connecting rod, *F*, is pivoted to the cutter *B* at one end, while its other end is pivoted to the nut *K*. A similar rod, *G*, extends from the nut to an adjustable block, *H*, at the end of the ways opposite the cutters. A screw, *E*, passes through



IMPROVED SAFETY HOISTING CAGE.

the nut *K*, and turns loosely without advancing in the slide *D* in the ways below. By means of a lever, *L*, the screw *E* is turned and thus moves the nut *K* down, and by means of the rods *F* and *G*, forces the cutters together so as to sever anything which may be placed between them. The block *H* is made adjustable by means of a screw, *I*, so as to accommodate the machine to larger or smaller bolts. In order to prevent the sliding block *D* from becoming cramped or bound by the advance of the nut *K* and screw *E*, towards the cutters when in operation, a connecting rod, *J*, is pivoted to the block and also to the centre of the rod *F*, as shown, and this ensures a parallel movement of the block *D*, so that it is always kept in line with the nut. This ingenious device is the invention of Mr. Leonard J. Chapman, of Vallejo, and has recently been patented through the MINING AND SCIENTIFIC PRESS agency. It promises to be exceedingly useful, and parties desirous of using the machine would do well to consult Mr. Chapman.

Lecture on Zoology.

The third lecture of the Polytechnic course was delivered in the upper hall of the Mechanics' Institute, on Saturday evening last, by Dr. George Hewstou. The Doctor announced that this was the first of a course of ten lectures which he proposed to deliver on this subject.

He began his remarks with a brief review of the commencement of animal life, following it up through all its various phases to the present time. He dwelt upon the different classes, making careful comparisons and illustrations, which portion of his remarks was listened to with marked attention by the large audience present. He spoke of the deep interest which attaches to the study of zoology, its usefulness, and its beneficial effect upon the mind, and of its recent introduction, as a study, into institutions, which have for centuries ignored it as a profitable branch of education.

The speaker alluded to the usefulness of the study in the way of mental training. He said it would instruct and elevate the mind, and raise up for the student, friends on every hand, to whom he was before a total stranger. The little inhabitants of the field, wood and beach, will all become objects of intense interest to

him. He will know their structure, their genera, their objects and habits. Moreover one cannot properly study nature without being led to look up through nature, to nature's God.

We regret that want of space will not admit of a full report of this interesting and instructive lecture. The Doctor has a happy style of presenting his views, and consequently enchains the attention of all. He spoke for about an hour and a half, during which time the audience did not lose interest in his remarks, and at the close they appeared well pleased.

STORMY WEATHER.—For the past week we have had abundant rains all over the State of California, and the "lower country" has been especially benefited. The large amount of snow which has fallen on the Sierra Nevadas, will serve to keep the streams full late in the coming summer, and will be of great value to the placer miners. The storms in the mountains of Utah and Nevada have been severe. At Pioche about 8,000 pounds of silver bullion had accumulated since the stoppage of the Salt Lake stages. The snow blockade in the mining cañons of the Wasatch range in Utah is very serious, and some distress even is expected among miners needing food. The bad condition of the roads prevent supplies coming forward freely, and work in many mines is totally suspended. At Little Cottonwood, Utah, the snow is 12 feet deep, in level places and the roads are impassable. The Utah Northern Railroad is still blocked. The Davenport, Flagstaff, Union, Utah and Grizzly and other mines have reduced their working force. Large quantities of ore are on the dumps, and the winter there is more severe than the last.

Heavy storms have occurred on the Atlantic, and on the English Coast have caused considerable loss of life and property. The cold in the East is unprecedented, and even in this State it has been unusually severe. Snow can be seen from this city on the hills across the Bay, which is an exceptional occurrence. In San Diego, Santa Barbara and Los Angeles a good supply of rain has fallen, enough, according to the local papers, to ensure good crops. The prospects for both miners and farmers for the coming year are excellent throughout the State, and our million yield, as well as the quantity of wheat raised, will be greater than usual.

NEW MAIL FACILITIES.—Service on the new mail route from Hardyville, via Mineral Park, Cerbat and Chloride to Arizona, was to have commenced January 20th. This will be of great benefit to residents in those remote mining districts.

PATENTS & INVENTIONS.

Telegraphic List of U. S. Patents Issued to Pacific Coast Inventors.

[REPORTED OFFICIALLY FOR THE MINING AND SCIENTIFIC PRESS, DEWEY & CO., PUBLISHERS AND U. S. AND FOREIGN PATENT AGENTS.]

By Special Dispatch, Dated Washington, D. C., Feb. 4th, 1873.

FOR WEEK ENDING JANUARY 21st, 1873.

ROTARY CULTIVATOR.—James W. Milroy, assignor to self, Wm. R. Michener and C. L. Howard, Haywood, Cal.
OYSTER TONGS.—Isaac Smith, Bruceport, Washington Ter.

*The patents are not ready for delivery by the Patent Office until some 14 days after the date of issue.
NOTE.—Copies of U. S. and Foreign Patents furnished by DEWEY & CO., in the shortest time possible (by telegraph or otherwise) at the lowest rates. All patent business for Pacific coast inventors transacted with greater security and in much less time than by any other agency.

EUREKA CONSOLIDATED.—Another controversy is going on about the Eureka Consolidated mine and the stockholders want to know why no dividends have been paid when the mine is in so prosperous a condition. It will be remembered that last year there was considerable complaint against the managers about a reported scandalous charcoal contract, and a reported contract given for hauling ore above rates which could have been made. A correspondent of the *Virginia Chronicle*, in a letter to that paper states that the superintendent's reports show that from two to four furnaces have been running continually, the bullion proceeds from what must have been from \$120,000 to \$130,000 per month and yet no dividends have been paid. Stockholders in Virginia think that if they had been fairly treated they would have received a dividend of \$2 per share for the last six months. One report current is to the effect that the Trustees are purchasing this stock in the interest of an English Company and that the affairs of the company have been purposely mismanaged to depress the stock by disgusting the shareholders. It is generally understood that the Richmond Consolidated Company, who are engaged in a litigation with the Eureka Cons. Co., have bought about 24,000 shares of the stock of the latter at the present low rates. A long time has elapsed since the first complaints were made against the way affairs have been managed and there seems to have been no improvement even since the change in management. The stockholders desire, and justly too, that the trustees make an exhibit of the affairs of the company and explain why no dividends have been paid and where the money has gone to.

DEATH OF LIEUTENANT MAURY.—The distinguished astronomer and hydrographer, Matthew Fontaine Maury, died at Lexington, Virginia, on the 1st inst. He was the author of several works, among which may be mentioned the "Physical Geography of the Sea," and one on Navigation. He was astronomer to the South Sea Exploring Expedition under Commodore Jones, and was at one time in charge of the depot of charts and instruments, which served as a nucleus for the National observatory and Hydrograph office of the United States, of both of which he became Superintendent. His labors in organizing the observations as well as his investigations in connection with the winds and currents of the sea are familiar to all. The King of Prussia presented him with a gold medal, and the Emperor of Austria gave him the large gold medal of the Arts and Sciences as a recognition of his services. He has been living in retirement for some time.

SKILLED LABOR.—The *Salt Lake Tribune* very sensibly believes in the employment of able professional men about mining property, and cites the results achieved by the Germania company as an illustration of the success attending the employment of professional men and skilled labor. Men who are thorough masters of their business should be employed only. The *Tribune* says that experience has demonstrated that the majority of failures in smelting are to be attributed to lack of necessary skill at the start.

CALIFORNIA PIONEERS.—At the last meeting of this Association an attempt was made to extend the time of membership to September 9th, 1850, but the "49ers" carried the day, so the rules remain unchanged.

THE GLOBE ROLLING MILLS in Cincinnati were burned on the evening of the 4th inst.; loss \$70,000.

Laws Under New California Code—Taking Effect Jan. 1, 1873.

(Continued from page 74.)

[False certificate, report, or notice to make officers liable.]

316. Any officer of a corporation who makes or gives a certificate, official report, public notice, or entry in any of the records or books of the corporation, concerning the corporation or its business, which is false in any material representation, and who knew or had full opportunity to know the same to be false, is liable for all the debts of the corporation contracted while he was a stockholder or officer thereof; and if more than one violate the provisions of this section in concert, they are jointly and severally liable.

[Meeting by consent to be valid.]

317. When all the stockholders or members of a corporation are present at any meeting, however called or notified, and sign a written consent thereto on the record of such meeting, the doings of such meeting are as valid as if had at a meeting legally called and noticed.

[Proceedings at meeting to be binding.]

318. The stockholders or members of such corporation, when assembled, may elect officers to fill all vacancies then existing, and may act upon such other business as might lawfully be transacted at regular meetings of the corporation.

[Meetings where held.]

319. The meetings of the stockholders and Board of Directors of a corporation must be held at its office or principal place of business.

[When no provision in by-laws for regular meetings, special meetings, how called.]

320. When no provision is made in the by-laws for regular meetings of the Directors and the mode of calling special meetings, all meetings must be called by special notice in writing, to be given to each Director by the Secretary, on the order of the President, or if there be none, on the order of two Directors.

[Liabilities of stockholders. They may be released, when.]

322. Each stockholder or member of any corporation is severally, individually, and personally liable for such proportion of all its debts and liabilities as the amount of stock or shares owned by him in such corporation bears to the whole of the subscribed capital stock or shares of the corporation, for the recovery of which joint or several actions may be instituted and prosecuted; and in any such action against any of the stockholders or members of a corporation, the Court must ascertain and determine the proportion of the debt which is the subject of the suit for which each of the stockholders or members who are defendants in the action are severally liable, and judgment must be given severally in conformity therewith. If any stockholder or member of a corporation pays his proportion of any debt due by such corporation, he is released and discharged from any further individual or personal liability for such debt. Stock held as collateral security, or by a trustee, or in any other representative capacity, does not make the holder thereof a stockholder, but the pledgor or person or estate represented is the stockholder.

[Certificates, how and when issued.]

323. All corporations for profit must issue certificates for stock when fully paid up, signed by the President and Secretary, and may provide, in their by-laws, for issuing certificates prior to the full payment, under such restrictions and for such purposes as their by-laws may provide.

[Transfer of shares.]

324. Whenever the capital stock of any corporation is divided into shares, and certificates therefor are issued, such shares of stock are personal property and may be transferred by indorsement by the signature of the proprietor, or his attorney or legal representative, and delivery of the certificate; but such transfer is not valid, except between the parties thereto, until the same is so entered upon the books of the corporation as to show the names of the parties by and to whom transferred, the number or designation of the shares, and the date of the transfer.

[Transfer of shares held by married women, etc. Dividends payable to married women.]

325. Shares of stock in corporations held or owned by a married woman may be transferred by her, her agent, or attorney, without the signature of her husband, in the same manner as if such married woman were a *femme sole*. All dividends payable upon any shares of stock of a corporation held by a married woman may be paid to such married woman, her agent, or attorney, in the same manner as if she were unmarried, and it is not necessary for her husband to join in a receipt therefor; and any proxy or power given by a married woman, touching any shares of stock of any corporation owned by her, is valid and binding without the signature of her husband, the same as if she were unmarried.

[Non-resident stockholders. Bonds.]

326. In all transfers of shares of stock in corporations, on behalf of owners residing out of the State, the President, Secretary, or Directors of such corporation, before entering such transfer on the books of the corporation or issuing the certificate therefor to the transferee, must require from such attorney, or from the person claiming under such transfer, a bond of indemnity, with two sureties, satisfactory to the officers of the corporation, or, if not so satisfactory, then approved by the District Judge of the district in which the principal office of the corporation is situated, conditioned to protect such corporation against any liability to the legal representatives of the owner of such stock, in case of his or her death before such transfer; and in case of refusal to furnish such bonds upon request, such transfer is utterly void as against the corporation.

Corporate Powers.

[Powers of corporations.]

354. Every corporation, as such, has power:

1. Of succession, by its corporate name, for the period limited; and when no period is limited, perpetually;
2. To sue and be sued, in any Court;
3. To make and use a common seal, and alter the same at pleasure;
4. To purchase, hold and convey such real and personal estate as the purposes of the corporation may require, not exceeding the amount limited in this Part.
5. To appoint such subordinate officers or agents as the business of the corporation may require, and to allow them suitable compensation;
6. To make by-laws, not inconsistent with any existing law, for the management of its property, the regulation of its affairs, and for the transfer of its stock;
7. To admit stockholders or members, and to sell their stock or shares for the payment of assessments or installments.
8. To enter into any obligations or contracts essential to the transaction of its ordinary affairs, or for the purposes of the corporation.

[Limitation of powers.]

355. In addition to the powers enumerated in the preceding section, and to those expressly given in that Title of this Part under which it is incorporated, no corporation shall possess or exercise any corporate powers, except such as are necessary to the exercise of the powers so enumerated and given.

[Banking expressly prohibited.]

356. No corporations shall create or issue bills, notes, or other evidences of debt, upon loans or otherwise, for circulation as money.

[Misdemeanor does not invalidate instrument.]

357. The misdemeanor of a corporation in any written instrument does not invalidate the instrument, if it can be reasonably ascertained from it what corporation is intended.

[Corporation to organize within one year.]

358. If a corporation does not organize and commence the transaction of its business or the construction of its works within one year from the date of its incorporation, its corporate powers cease. The due incorporation of any company, claiming in good faith to be a corporation under this Part, and doing business as such, or its right to exercise corporate powers, shall not be inquired into, collaterally, in any private suit to which such de facto corporation may be a party; but such inquiry may be had at the suit of the State on information of the Attorney-General.

[Increasing and diminishing capital stock, how.]

359. Every corporation may increase and diminish its capital stock, as in this section provided:

1. By a majority vote of the Directors there may be called a meeting of the stockholders, to be convened for the purpose of increasing or of diminishing the capital stock;

2. Personal notice of the time and place of such meeting, and the object thereof, must be served on each stockholder resident in this State; or, in lieu thereof, the notice must be published in every issue of a newspaper published in the county where the principal place of business is located, for four weeks successively;

3. The notice must also contain the amount to which it is proposed to increase or diminish the capital stock;

4. The capital stock must in no case be diminished to an amount less than the indebtedness of the incorporation or the estimated cost of the works which it may be the object or purpose of the corporation to construct.

5. At least four-fifths of all the capital stock must be represented at such meeting, and at least two-thirds of the entire capital stock must vote in favor of such increase or diminution before the same is effected;

6. A certificate, signed and verified by the Chairman and Secretary of the meeting, must be made, showing a strict compliance with all the requirements of this section, the amount to which the capital stock has been increased or diminished, the amount of stock (and by whom held) represented at the meeting, the vote by which the object was accomplished, the amount of capital stock actually paid in, and the amount of all debts and liabilities of the corporation, and how secured;

7. This certificate must be subscribed by a majority of the Directors, and duplicates made, one to be filed in the office of the County Clerk and one in the office of the Secretary of State, as provided for original articles of incorporation, and thereupon the capital stock is so increased or diminished.

[Corporations may acquire real property and how much.]

360. No corporation shall acquire or hold any more real estate than may be absolutely necessary for the use of the business conducted or the construction of their works, except as specially provided. A corporation organized for any purpose specified in Subdivisions 3, 4, 5, 7, 8, and 15, of Section 286, may acquire real property as provided in Title VII, Part III, CODE OF CIVIL PROCEDURE, when needed for the uses and purposes therein mentioned.

To be Continued.

A Vast Hydraulic Mining Claim.

The Messrs. Hendricks in Morris Ravine, have a vast mining claim of excellent pay dirt, with the best appliances, and water to work it. The extensive gravel deposit into which their 2,500 inches of water, under several hundred feet pressure is cutting its way, is unmistakably of the same character as the deposits at Cherokee, and will not fail to be equally as remunerative. Their mining flume, which lies deep down in the bed rock at the claim, extends down the ravine for the distance of a mile or more, is 4 feet in width, of firm and substantial structure, and paved with rock. It is their design to extend the flume down the ravine to Feather river, a short distance above Oroville, and opposite river claim of '57, known as the famous Cape claim. It was the theory of the speculator then that the rich deposits found in the famous Cape, were washed down Morris Ravine from the deposits underlying Table Mountain. Morris Ravine, itself was one of the rich and famous surface mining ravines of '49 and '50, and strengthened the theory of the river deposits. The ravine, from its confluence to the claim of Messrs. Hendricks, has been little more than skimmed off, while such claims as the Monte De Oro, and those of Rigby, and Boyd high up on the mountain sides of the ravine, show that the whole formation is a deposit of auriferous earth. The ravine itself shows evidence of having only been slightly scratched over, while the claims above referred to having been worked successfully for years, yet seem to be nothing more than mere scars on the mountain sides. Doubtless a much greater impression could have been made on those huge deposits, but for the small amount of water afforded by the water-shed of Table Mountain, and some of them, (the Monte De Oro for instance,) being situated so high on the side of the mountain as to afford but very little water during seasons of the greatest rainfall.

The Messrs. Hendricks appear to have mastered the situation so far as a supply of living water for their own use is concerned, by the construction of a ditch some fifty miles in length, taking water from the West Branch of the Feather river, conveying it across depressions in huge iron pipes and around the mountain sides in ditches. This large ditch carrying 2,500 inches of water winds around the hills in the vicinity of Cherokee with tantalizing placidity to the miners of Cherokee whose rich claims lie idle a good portion of the year for want of the flood of water that runs at their very feet, but the ditch was not calculated for that altitude, and it gracefully curves from their view, clinging to the crumbling sides of the North Table Mountain, until it debouches into a vast reservoir at the head of Morris Ravine. From thence it is carried in pipes under several hundred feet pressure, to the claim. Here a distributor divides the current into 3 pipes to each of which is attached a hydraulic chief, which hurls 800 inches of water against the face of the claim with great and irresistible force, before which the earth melts away, and even the bed-rock is torn up and thrown high in the air, shivered to atoms and whirled away down the flume by the rapid current. These hydraulic chiefs are operated each by a single man, and, after the flume is laid, and the mountain loosened with powder, do the work of mining.

On a recent flying visit to this claim, we witnessed the power of one of these monitors, in cutting a passage through the bed-rock for the flume. It was stationed above the head of the flume, and hurled 800 inches of water through a 5-inch nozzle on to the bed-rock in the direction of the head of the flume, cutting its way through the rock with the apparent precision and ease of a gardener's spade in yielding

soil, and almost with the rapidity of electricity. It is but recently these vast arrangements have been perfected on this claim. Indeed the large 4-foot flume is not yet completed to the face of the claim, and it will be but a short time, before the claim of Messrs. Hendricks will equal, if not excel, any other hydraulic mining operation in the State. Blasting tunnels have been run into a mountain almost as large as one of our Buttes, which will soon be shattered by a blast, fired by electricity, the buildings in the vicinity being barricaded by planks, to protect them from the falling debris. The hydraulic chief, under the direction of a single man will do the balance of the work. Much coarse gold is found on the bed-rock in their claim. A piece weighing over 4 ounces was picked up the morning of our visit. The Messrs. Hendricks have expended a large sum of money in making these extensive preparations for mining, and will soon realize a hundred fold.

There are many pleasant residences and vineyards nestled in the sheltered nooks of the mountains along Morris Ravine, and around the lower Table Mountain, giving promise of future wealth and happiness, when the miner has worked away the deposit of pay dirt. The drive up Morris Ravine, and around the lower Table Mountain to the valley road leading to Chico, is a pleasant one, over a good road, and will not fail to show the two great resources of Butte, viz: Mining and Agriculture, while 3 or 4 miles beyond lies Cherokee with its untold millions of gold dust on deposit, and numberless diamonds waiting to be unearthed, that they may reflect back the genial light, and double the happiness of the toiling miner, and make glad the household of the present husbandman.—Oroville Record.

Mines and Bullion Product of Nevada.

A correspondent of the Sacramento Record quotes from the report of the Nevada State Mineralogist as follows: "The bullion product of Nevada, 1872, equals almost one-half all the bullion produced west of the Missouri river. In the State there are no less than 162 mining mills and furnaces, and 1,904 stamps, capable of reducing daily 5,183 tons of ore. The gold and silver product for 1871 was \$20,010,175.12, while in 1872, estimating the last quarter, it is \$23,619,212.09, with several thousand tons of lead, copper and antimony."

Mines & Owners.	Tons.	Lbs.	1872-9 mths Value
Elko.....	8	7,517	\$360,696 77
Lyon.....	18	187,364	528,117 00
Esmeralda.....	13	4,722	104,937 62
Lincoln.....	10	38,631	4,019,567 30
Nye.....	67	2,157	327,734 08
Humboldt.....	11	15,388	351,529 91
Lander.....	20	40,895	1,871,378 43
Storey.....	25	317,616	9,580,910 22
White Pine.....	67	22,684	620,699 80
Add estimate for 4th quarter 1872..	227,200	.....	5,542,000 00
Washoe.....	1	6,521	36,610 00
Totals.....	870,552	1,699	\$23,361,671 03

Bus. —Twenty-two trains are now running on the Virginia and Truckee Railroad (Washoe), and one track appears to be inadequate to accommodate the immense freighting business. The G. & H. Hill News says that to keep these trains from hitting each other is a matter of no ordinary difficulty. The men engaged in running the trains make four trips a day, and find they have very arduous labor to perform.

LARGE SHOP.—The largest smith's shop in the world has been added to the other wonders of the Royal Arsenal at Woolwich. It is about 200 feet in length by 120 in breadth, and contains 72 forges, several furnaces, and the foundations for six steam hammers—one of 70 cwt, one of 20 cwt, two of 15 cwt, one of 6 cwt and one of 5 cwt.

KENTUCKY is to have a State geologist, with two assistants, to make a complete geological, mineralogical, and chemical survey of the State.

Directory.

H. C. BENNETT, STATISTICIAN.

Reports and estimates made about all departments of Production, Commerce, and Manufacture, of the Pacific Coast. 5v24-1f

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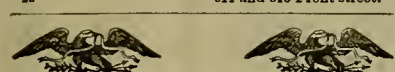
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Chemical Apparatus,

Having been engaged in furnishing these supplies since the first discovery of mines on the Pacific Coast.

Our Gold and Silver Tables, showing the value per ounce Troy at different degrees of fineness, and valuable tables for computation of assays in Grams and Graines, will be sent free upon application.

7v25-1f JOHN TAYLOR & CO.

Important to Miners and Mill Men.

Silver-Plated Copper Amalgamating Plates,
for Saving Gold.



Of all sizes and in any quantity, furnished to order. Full instructions sent for operating.

Particular attention given to plating goods for Builders, Plumbers, etc. Hotel and Restaurant work replated.

SAN FRANCISCO GOLD AND SILVER PLATING WORKS,
655 Mission street, San Francisco.

2v25-3m E. G. DENNISTON, Proprietor.

To Mill Men and Miners.

I am now manufacturing

CYANIDE OF POTASSIUM,

Which I can sell upon better terms than any other dealer on the Pacific Coast.

I make three grades or qualities to suit the requirements of different consumers.

I will be glad to furnish prices to any person addressing me on the subject.

HENRY G. HANKS,

Manufacturing Chemist,

PACIFIC CHEMICAL WORKS, SAN FRANCISCO

24v25-1f

Varney's Patent Amalgamator.

These Machines Stand Unrivaled.

For rapidly pulverizing and amalgamating ores, they have no equal. No effort has been, or will be spared to have them constructed in the most perfect manner and of the great number now in operation, not one has ever required repairs. The constant and increasing demand for them is sufficient evidence of their merits.

They are constructed so as to apply steam directly into the pulp, or with steam bottoms, as desired.

This Amalgamator Operates as Follows.

The pan being filled, the motion of the muller forces the pulp to the center, where it is drawn down through the aperture and between the grinding surfaces. Thence it is thrown to the periphery into the quicksilver. The curved plates again draw it to the center, where it passes down, and to the circumference as before. Thus it is constantly passing a regular flow between the grinding surfaces and into the quicksilver, until the ore is reduced to an impalpable powder, and the metal amalgamated.

Settlers made on the same principle excel all others. They bring the pulp so constantly and perfectly in contact with quicksilver, that the particles are rapidly and completely absorbed.

Mill-men are invited to examine these pans and settlers for themselves, at the office, 229 Fremont Street, San Francisco

Richardson & Co., Copper Ore Wharves, SWANSEA.

RICHARDSON & Co. have been for thirty years established in Swansea as Agents for the preparation, Sampling, Assaying, and Sale of Copper, Silver, Gold, Lead, Zinc, and all other Ores and Metals, for which they have extensive Warehouses and Wharves under cover, 1,500 feet of Quay Frontage within the Floating Dock, and the most complete Machinery and Appliances. They are also prepared to make advances against Ores in anticipation of realization, and to guarantee all payments when required. 17v21-1y

PLATINUM

Vessels, Apparatus, Sheet, Wire, Etc., Etc.

For all Laboratory and Manufacturing Purposes

H. M. RAYNOR,
25 Bond street, New York. 23v18

Platinum Scrap and Ore purchased.

CHARLES KIRCHNER,

Sampler and Crusher of Ores,

NO. 11 DRUM STREET,

San Francisco.

SEVERANCE, HOLT & CO.,

MANUFACTURERS OF

Diamond-Pointed Drills

—AND—

DRILLING MACHINERY,

For Mining, Quarrying, Shafting, Tunneling, Prospecting, Draining, Grading and Submarine Blasting.

Special attention given to deep boring for testing the value of Mines; also, to boring Artesian Wells.

No. 315 CALIFORNIA STREET.

SAN FRANCISCO, CAL.

SHEET IRON PIPE.

THE

Risdon Iron and Locomotive Works

Corner Howard and Beale Streets,

Are prepared to make SHEET IRON AND ASPHALTUM PIPE, of any size and for any pressure, and contract to lay the same where wanted, guaranteeing a perfect working pipe with the least amount of material.

Standard sizes of railroad Car Wheels, with special patterns for Mining Cars. These small wheels are made of the best Cast Iron, properly chilled, and can be fitted up with the improved axle and box—introduced by this company, and guaranteed to outlast any other wheels made in this State.

All kinds of Machinery made and repaired.

24v22-3m JOSEPH MOORE, Superintendent.

L. SCHUMANN,

PIONEER

Meerscham Pipe Manufacturer,



No. 341 KEARNY STREET,

Between Bush and Pine streets, San Francisco

The first and only Manufacture on the Pacific Coast. MEERSCHAUM MOUNTED WITH SILVER. Meerscham Pipes Boiled and Repaired. Amber Mouth-pieces Fitted.

WARNER & SILSBY

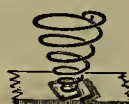
Manufacture all sizes of

Bed and Sofa Springs,

Which they offer to the trade at

reduced prices; also the celebrated

Overmann Self-Fastening Bed Spring.



Any man can make his own Spring Bed with them by attaching them to the slats of any bedstead.

No. 147 New Montgomery Street, corner of Natoma, San Francisco. 23v3-6m

OAKEY & SON'S EMERY AND BLACK

LEAD MILLS, Blackfriars Road, London, England.

OAKEY'S WELLINGTON KNIFE POLISH.

Packets, 3d. each; tins, 6d., 1s., 2s., 6d., and 1s. each.

OAKEY'S INDIA RUBBER KNIFE

BOARDS from 1s. 6d. each.

OAKEY'S SILVERSMITH'S SOAP (NON

MERCURIAL), for Cleansing and Polishing Silver, Electroplate, Plate-glass, Marble, etc. Tablets, 6d. each.

OAKEY'S GENUINE EMERY, GRAIN

AND FLOUR.

OAKEY'S EMERY AND GLASS CLOTH.

OAKEY'S CABINET GLASS PAPER,

BLACK LEAD, etc.

OAKEY'S GOODS SOLD EVERYWHERE

by Ironmongers, Grocers, Oilmen, Brushmakers, Drugists, etc. 21v25-1y

J. M. STOCKMAN,

Manufacturer of

PATTERNS AND MODELS,
(Over W. T. Garratt's Brass Foundry).

N. W. corner Natoma and Fremont streets, S. F. Entrance on Natoma street. 6v23-3m

Jos. Thornhill, 1612 Mason Street, near Green.

C. W. WHITE, 47 Clay Street.

JOS. THORNHILL,

Bricklayer and Contractor

Mining Company's Report.

Raymond & Ely.

The annual meeting of the Raymond & Ely Mining Company was held Jan. 28th. All the old Trustees were re-elected except L. A. Booth, who declined a nomination, and Henry Raymond was elected in his stead. The Secretary reports that the ore worked at the mills during the year have yielded over 75 per cent. of the pulp assay. The two mills, 20 and 30 stamps, are in good condition and the completion of the railroad between Pioche and Bullionville will greatly reduce the cost of transportation. The Lightner shaft in the mine is now down 623 feet—7th level—and they are still sinking it. In this shaft above the 7th level there are 24,000 tons of ore assaying \$125 per ton; and there are 4,000 tons of the same average value in the Creole mine with over 12,000 tons of third-class ore on the dumps. The following is the Superintendents summary of operations for the year:

Ore on hand at beginning of year, tons.....	1,907
Ore extracted during the year.....	30,369
Total.....	32,276
Ore shipped to mills.....	20,874
Ore reduced at mills.....	23,626
Ore on hand at mills.....	600
Ore on hand at the dumps.....	13,193

In the Secretary's report are some interesting items. The mine has only been in operation about two years, and since March 1871, it has paid as dividends to Stock holders the sum of \$2,635,000, including the December dividend. The dividends in 1871 averaged \$20.50 per share, and \$69 in 1872; and were at the rate of 55 per cent of the gross receipts in 1872, against 46 per cent in 1871. The bullion production in 1871 was \$1,361,590, against \$3,693,936 in 1872. The total dividends have been as follows:

1871.....	18,72
January.....	\$90,000
February.....	150,000
March.....	300,000
April.....	30,000
May.....	210,000
June.....	210,000
July.....	30,000
August.....	30,000
September.....	45,000
October.....	120,000
November.....	150,000
December.....	150,000
Totals.....	\$2,635,000

The Secretary's report gives the following account of the receipts and disbursements:

RECEIPTS.	
From bullion.....	\$3,693,936
Superintendent's drafts not presented.....	18,005
Miscellaneous.....	7,473
Total receipts.....	\$3,719,414
Cash, per previous report.....	64,681
Total.....	\$3,784,095

DISBURSEMENTS.	
Lands, claims and titles.....	\$49,781
Law expenses.....	48,386
For mining.....	558,700
For milling.....	410,463
Hauling ore to mills.....	162,944
Mine improvements.....	3,890
Mill improvements.....	14,110
Completion of mill.....	26,550
Taxes.....	80,494
Dividends.....	2,070,000
Discount on bullion.....	55,563
Advance to Nevada Central Railroad.....	100,000
Insurance on mills.....	7,322
Office salaries.....	7,200
Miscellaneous.....	8,668
Outstanding drafts paid.....	30,521
Total disbursements.....	\$3,635,517
Cash, January 28, 1873.....	148,578
Total.....	\$3,784,095

Following is a statement of the assets and liabilities of the company:

ASSETS.	
Improvements at mines.....	\$34,525
Stores at mines.....	12,354
Ores on dumps.....	640,146
Mills, etc.....	198,109
Stores at mills.....	100,517
Ores at mills.....	33,600
Tailings at mills.....	670,960
Advanced to railroad.....	100,000
Office furniture.....	1,844
Cash on hand.....	148,578
Total.....	\$1,941,571

The only liabilities consist of the Superintendent's drafts advised, but not presented, amounting to \$18,005. As will be seen from these figures, this mine is one of the most prosperous on the Coast, and has steadily paid dividends since operations were first begun. The management has the confidence of stockholders and carry on business in their interest.

Belcher.

The annual meeting of the Belcher Mining Company was also held on Jan. 28th. As a general result the mine has spent \$300,000 in construction, paid as dividends to stockholders \$2,184,000 and increased its surplus on hand from \$712,945, to \$1,023,301; out of the latter amount the January dividend of \$312,000 was paid, leaving \$711,301. The cost of mining was \$9.07 per ton, and cost of crushing \$12 per ton. The average yield of the ore was \$57.63 per ton. The Secretary's report is as follows:

RECEIPTS.	
From bullion.....	\$4,791,629
Virginia.....	5,230
Total receipts.....	\$4,796,859
Cash January 1, 1873.....	712,945
Total.....	\$5,509,804

DISBURSEMENTS.

Labor account.....	\$560,509
Crushing 83,195 tons ore.....	998,341
Hoisting ore.....	83,534
Mine extension south.....	124,184
Mine extension north.....	31,458
Wood and coal.....	63,141
Timber and Lumber.....	113,353
Assaying.....	150,829
Taxes.....	37,262
Exchange and discount on bullion.....	63,217
General, legal and office expenses.....	25,310
Treasure and other freight.....	55,537
Construction.....	21,782
Salaries at Gold Hill.....	8,750
Dividends to Stockholders.....	2,184,000
Supplies.....	13,865
Cash in hands of Supt.....	12,474
Cash January 1, 1873.....	1,011,124
Total.....	\$5,512,834

COST OF PRODUCING AND REDUCING 83,195 TONS ORE.

Crushing, per ton.....	\$12 00
Mining, per ton.....	9 07
Total cost, per ton.....	\$21 07
83,195 tons produced \$1,794,659 10; per ton.....	57 63

Net, per ton.....	\$36 55
The bullion report is as follows:	
Bullion, gold value.....	\$3,087,948 55
Bullion, silver value.....	1,706,710 54
Total.....	\$4,794,659 10

Among the expenses included in the \$21.07 per ton per cost of producing and reducing 83,195 tons was \$83,000 paid to the Yellow Jacket Mining Company for hoisting ore before the connection was made between the Belcher shaft and the levels.

THE STANFORD MILL at White Pine, which has been idle for some time, will start up as soon as the condition of the road will admit of ore being hauled.

San Francisco Metal Market.

PRICES FOR INVOICES.

Shipping prices rule, from ten to fifteen per cent. higher than the following quotations. WEDNESDAY, Feb. 5, 1873.

IRON.	
Scotch Pig Iron, 40 lb. ton.....	\$50 00 @ 55 00
White Pig, 40 lb. ton.....	50 00 @ 55 00
Refined Bar, bad assortment, 40 lb. ton.....	— @ —
Refined Bar, good assortment, 40 lb. ton.....	— @ —
Boiler, No. 14, 40 lb. ton.....	— @ —
Plate, No. 5 to 9, 40 lb. ton.....	— @ —
Sheet, No. 10 to 13, 40 lb. ton.....	— @ —
Sheet, No. 14 to 20, 40 lb. ton.....	— @ —
Sheet, No. 21 to 27, 40 lb. ton.....	— @ —
Hot Rolled, 40 lb. ton.....	— @ —
Nail Rod, 40 lb. ton.....	— @ —
Norway Iron, 40 lb. ton.....	— @ —
Roller Iron, 40 lb. ton.....	— @ —
Other Irons for Blacksmiths, Miners, etc. 40 lb. ton.....	— @ —
COPPER.	
Braziers.....	— @ —
Copper.....	— @ —
O. N. E. Pat.....	— @ —
Sheathing, 40 lb. ton.....	— @ —
Sheathing, Yellow, 40 lb. ton.....	— @ —
Reheating, Old Yellow, 40 lb. ton.....	— @ —
Composition Nails.....	— @ —
Composition Bolts.....	— @ —
TIN PLATES.	
Plate, 10 lb. sheet.....	17 00 @ —
Plate, 10 lb. sheet.....	15 00 @ —
Roofing Plate, 10 lb. sheet.....	14 00 @ —
Banco Tin, 10 lb. sheet.....	— @ —
Street, English Cast, 40 lb. ton.....	— @ —
Drill.....	— @ —
Flat Bar.....	— @ —
Flough Points.....	— @ —
Russ (for mould boards).....	— @ —
Zinc, Sheet.....	— @ —
NAILS—Assorted sizes.....	— @ —

Leather Market Report.

[Reported for the Press by Dolliver & Co.]

SAN FRANCISCO, Wednesday, Feb. 5, 1873.	
The price of leather continues to advance. Fresh stocks have advanced 5 per cent., and importers are firm in their prices.	
City Tanned Leather, 40 lb. doz.....	26 @ 29
Santa Cruz Leather, 40 lb. doz.....	26 @ 29
Country Leather, 40 lb. doz.....	26 @ 29
Stockton Leather, 40 lb. doz.....	26 @ 29
Best Jodot, 10 to 15 lb. per doz.....	55 00 @ 85 00
Jodot, second choice, 11 to 16 lb. per doz.....	55 00 @ 70 00
Levine, 16 to 18 lb. per doz.....	75 00 @ 75 00
Levine, 12 and 14 lb. per doz.....	65 00 @ 70 00
Best Jodot, 15 to 19 lb. per doz.....	65 00 @ 65 00
Cornellian, 12 to 14 lb. per doz.....	55 00 @ 60 00
Cornellian Females, 14 to 16 lb.....	65 00 @ 70 00
Quarter Calf, 40 lb. doz.....	54 00 @ —
Simon, 18 Kil. 40 lb. doz.....	60 00 @ —
Simon, 20 Kil. 40 lb. doz.....	65 00 @ —
Simon, 24 Kil. 40 lb. doz.....	72 00 @ —
Robert Calf, 7 and 8 Kil. 40 lb. doz.....	40 00 @ 40 00
French Kips, 40 lb. doz.....	1 00 @ 1 30
California Kip, 40 lb. doz.....	55 00 @ 70 00
French Sheep, all colors, 40 lb. doz.....	8 00 @ 10 00
Eastern Calf, 40 lb. doz.....	9 00 @ 10 00
Sheep Roans for Topping, all colors, 40 lb. doz.....	9 00 @ 10 00
Sheep Roans for Linings, 40 lb. doz.....	5 50 @ 10 00
California Rasclet Sheep Linings, 40 lb. doz.....	7 50 @ 5 00
Best Jodot Calf Boot Legs, 40 lb. pair.....	5 00 @ —
Good French Galf Boot Legs, 40 lb. pair.....	4 50 @ —
French Calf Boot Legs, 40 lb. pair.....	4 00 @ —
James Leather, 40 lb. doz.....	40 00 @ 37 1/2
Fair Bridge Leather, 40 lb. doz.....	48 00 @ 42 00
Skirting Leather, 40 lb. doz.....	34 00 @ 37 1/2
Welt Leather, 40 lb. doz.....	30 00 @ 30 00
Buff Leather, 40 lb. doz.....	18 00 @ 20 00
Wax Side Leather, 40 lb. foot.....	20 00 @ 22 00
Eastern Wax Leather.....	26 @ —

PACIFIC MINERAL LAND OFFICE—HOTY, SEARS & McKee—MERCHANTS' EXCHANGE, CALIFORNIA STREET, SAN FRANCISCO, CAL.—Mining Patents obtained for claims in California, Nevada, Utah, Arizona, and elsewhere. Plans and papers prepared for adverse claimants, as required by the new law; re-locations effected where claims have lapsed under the Congressional Act of May 10, 1872; Mining Contests conducted before the Departments and Courts.

Mr. McKee's experience as Chief of the Mining Claims Division, General Land Office, Washington, D. C., will be valuable to parties desiring to properly appear either as claimants for patents or as adverse claimants. Cases attended to in person at any of the District Land Offices, or at the Departments at Washington, where deemed necessary. JAS. T. HOYT, W. H. SEARS, O. H. McKEE. 1725-3m

WONDERFUL CURE.—A young man, a resident of this city, gives us the facts of the following remarkable cure. He says: "I suffered with Catarrh in its worst form. Bones came from my nose; my breath became offensive; I was compelled to eat alone; I had given up all hopes of being cured. At this time I met Dr. E. V. E. of Chicago, who had been cured by a remedy discovered by himself. I tried the remedy, with little faith; but at the end of three months found myself cured." Our informant has now associated himself with the discoverer in the manufacture of the article, which will be known under the name of the Diamond Catarrh Remedy. Price 50 cts.; sent by mail for 60 cts. A. F. EVORY, CO., No. 9 Post Street, San Francisco. Sold by all druggists. 25725-3m

A NEW BOOK ON MINING.

The Explorers, Miners and Metallurgists' Companion; Comprising a Practical Exposition of the Various Departments of Exploration, Mining, Engineering, Assaying and Metallurgy, The Most Practical and Comprehensive Work on Mining Subjects Extant. Comprising 640 Pages, and 81 Engravings. By J. S. Phillips, M. E. Price, bound in cloth, \$10 (in coin); in leather, \$12. Forwarded by mail, in cloth, \$11.40, currency; in leather, \$13.75. Issued and for sale by DEWEY & CO., Patent Agents and Publishers Mining and Scientific Press, S. F.

CONTINENTAL LIFE INSURANCE CO., No. 302 Montgomery street, corner of Pine.

DESIRABLE OFFICES

TO LET

Cor. Montgomery and California Streets, SAN FRANCISCO.

We have some very desirable rooms to let for business offices, at moderate rates, in the best location in the city. Apply at this office.

Mining and Other Companies.

Outing to the time necessary to mail the present large edition of the M. & S. Press, we are obliged to go to press on Thursday evening—which is the very latest hour we can receive advertisements.

Amazon Silver Mining Company—Location

of works, Ely District, Lincoln County, Nevada. Notice.—There are delinquent upon the following described stock, on account of assessment levied on the 22d day of October, 1872, the several amounts set opposite the names of the respective shareholders as follows:

Names.	No. Certificate.	No. Shares.	Amount.
H. McPherson, Trustee.....	2	50	\$ 5 00
H. McPherson, Trustee.....	3	50	5 00
H. McPherson, Trustee.....	4	50	5 00
H. McPherson, Trustee.....	4	50	5 00
H. McPherson, Trustee.....	5	50	5 00
H. McPherson, Trustee.....	6	50	5 00
H. McPherson, Trustee.....	7	50	5 00
H. McPherson, Trustee.....	8	50	5 00
H. McPherson, Trustee.....	9	50	5 00
H. McPherson, Trustee.....	10	100	10 00
H. McPherson, Trustee.....	11	50	5 00
H. McPherson, Trustee.....	16	500	50 00
H. McPherson, Trustee.....	17	2546	254 60
H. McPherson, Trustee.....	18	2546	254 60
H. McPherson, Trustee.....	19	2546	254 60
H. McPherson, Trustee.....	20	2546	254 60
H. McPherson, Trustee.....	21	2546	254 60
H. McPherson, Trustee.....	22	2546	254 60
H. McPherson, Trustee.....	23	4590	459 00
H. McPherson, Trustee.....	24	1273	127 30
H. McPherson, Trustee.....	25	1272	127 20
H. McPherson, Trustee.....	26	1272	127 20
H. McPherson, Trustee.....	27	1272	127 20
H. McPherson, Trustee.....	28	1490	149 00
H. McPherson, Trustee.....	29	500	50 00
H. McPherson, Trustee.....	30	500	50 00
H. McPherson, Trustee.....	31	500	50 00
H. McPherson, Trustee.....	32	500	50 00
H. McPherson, Trustee.....	33	250	25 00

And in accordance with law, and an order of the Board of Trustees, made on the 22d day of October, 1872, so many shares of each parcel of said stock as may be necessary, will be sold at public auction, at the office of the Company, No. 609 Sacramento street, San Francisco, California, on the fourteenth day of February, 1873, at the hour of 1 o'clock P. M. of said day, to pay said delinquent assessment thereon, together with costs of advertising and expenses of sale.

J. M. MONTANUS, Secretary pro tem. Office, 609 Sacramento street, San Francisco, Cal. ja25f.

Admiral Nelson Tunnel and Mining Company

—Location of works, Emma Hill, Little Cottonwood Mining District, Salt Lake County, Utah Territory. Principal place of business, in the city of San Francisco, California. Notice is hereby given that at a meeting of the Board of Directors of said Company, held on the 27th day of January, A. D. 1873, an assessment of ten cents per share was levied upon the capital stock of the Company, payable immediately in United States gold and silver coin, to the Secretary of the Company, at his office, room No. 1, in the building known as Montgomery Block, on the southeast corner of Montgomery and Washington streets, in the city of San Francisco, California. Any stock upon which said assessment shall remain unpaid on Saturday, the 8th day of March, A. D. 1873, will be delinquent, and will be duly advertised for sale at public auction, and unless payment shall be made before, will be sold on Monday, the 31st day of March, A. D. 1873, to pay the said delinquent assessment, together with the costs of advertising and expenses of sale. By order of the Board of Directors.

R. H. SINTON, Secretary. Office, No. 11 Montgomery Block, San Francisco.

Cordillera Gold and Silver Mining Company

—Location of property, Morelos Mining District, Chihuahua, Mexico. Notice.—There are delinquent upon the following described stock, on account of assessment levied on the 21st day of December, 1872, the several amounts set opposite the names of the respective shareholders, as follows:

Names.	No. Certificate.	No. Shares.	Amount.
O. A. Hall.....	251	32	\$4 80
V. R. Cooper.....	50	52	7 80
James Walsh.....	100	13	1 95
G. B. Andrews.....	102	5	75
G. B. Andrews.....	104	5	75
O. A. Hall.....	250	20	3 00
H. L. Ploche.....	390	20	3 00
Frank (not issued).....	853	125	45 00
Alfred Harris.....	137	5	75
Alfred Harris.....	148	8	1 20
P. M. Kelly.....	190	3	45
P. M. Kelly.....	126	2	30
V. N. Wade.....	222	50	7 50
V. N. Wade.....	233	100	15 00
C. W. McLaughlin.....	225	225	33 75

And in accordance with law, and an order of the Board of Trustees, made on the 21st day of December, 1872, so many shares of each parcel of said stock as may be necessary will be sold at public auction, at the office of said Company, 321 Washington street, on Monday, the 10th day of February, 1873, at the hour of 2 o'clock P. M. of said day, to pay said delinquent assessment thereon, together with costs of advertising and expenses of sale. H. R. REED, Secretary. Office, 321 Washington street, San Francisco, Cal. ja253f.

Eagle Quicksilver Mining Company—Location

of works, Santa Barbara County, California. Notice is hereby given that at a meeting of the Board of Trustees of said Company, held on the 18th day of January, 1873, an assessment of fifty dollars (\$50) per share was levied upon the capital stock of said Company, payable immediately in gold and silver coin of the United States, to the Secretary at his office, Room 5 and 6, No. 302 Montgomery street, San Francisco, California. Any shares upon which said assessment shall remain unpaid on Wednesday, March 13th, 1873, shall be deemed delinquent, and will be duly advertised on Saturday, March 23d, 1873, for sale at public auction, and unless payment shall be made before, will be sold on Monday, the 24th day of March, 1873, to pay the delinquent assessment, together with costs of advertising and expenses of sale. By order of the Board of Trustees. WM. H. WATSON, Secretary. Office, Room 5 and 6, No. 302 Montgomery street, San Francisco, Cal. ja25

Gold Run Mining Company—Location

of works, Nevada City, Nevada County, Cal. Principal place of business, in the city of San Francisco, California. Notice.—There are delinquent upon the following described stock, on account of assessment levied on the 30th day of December, 1872, the several amounts set opposite the names of the respective shareholders as follows:

Names.	No. Certificate.	No. Shares.	Amount.
Geo. R. Eckley.....	4	312 1/2	\$312 50
Geo. W. Downey.....	5	100	10 00
D. F. Hadley.....	10	25	25 00
Jos. M. Maguire.....	13	100	100 00
Jos. M. Maguire.....	14	207 1/2	207 50
Peter Bargion.....	unissued.	200	200 00

And in accordance with law, and an order of the Board of Directors, made on the 30th day of December, 1872, so many shares of each parcel of said stock as may be necessary, will be sold at public auction, at the office of the Company, corner Market and Spear streets, on the twenty-fifth day of February, 1873, at the hour of 12 o'clock P. M. of said day, to pay said delinquent assessment thereon, together with costs of advertising and expenses of sale.

O. C. PALMER, Secretary. Office, Corner Market and Spear streets, San Francisco, California. feb-3t

Ivanhoe Silver Mining Company—Location

of works, Ely District, Lincoln County, Nevada. Notice.—There are delinquent upon the following described stock, on account of assessment levied on the 13th day of December, 1872, the several amounts set opposite the names of the respective shareholders, as follows:

Names.	No. Certificate.	No. Shares.	Amount.
E. A. Richardson, Trustee.....	2	100	\$100 00
E. A. Richardson, Trustee.....	3	100	100 00
E. A. Richardson, Trustee....	4	100	100 00
E. A. Richardson, Trustee....	5	100	100 00
E. A. Richardson, Trustee.....	8	100	100 00
E. A. Richardson, Trustee.....	9	100	100 00
E. A. Richardson, Trustee.....	10	100	100 00
E. A. Richardson, Trustee.....	11	100	100 00
E. A. Richardson, Trustee.....	12	100	100 00
E. A. Richardson, Trustee.....	16	50	50 00
E. A. Richardson, Trustee.....	17	50	50 00
E. A. Richardson, Trustee.....	30	100	100 00
E. A. Richardson, Trustee.....	92	100	100 00
E. A. Richardson, Trustee.....	93	100	100 00
E. A. Richardson, Trustee.....	95	50	50 00
E. A. Richardson, Trustee.....	100	3000	3000 00
E. A. Richardson, Trustee.....	103	68	68 00
E. A. Richardson, Trustee.....	105	50	50 00
E. A. Richardson, Trustee.....	109	50	50 00
E. A. Richardson, Trustee.....	110	50	50 00
E. A. Richardson, Trustee.....	126	100	100 00
E. A. Richardson, Trustee.....	154	15	75 00
E. A. Richardson, Trustee.....	159	30	30 00
E. A. Richardson, Trustee.....	161	20	20 00
E. A. Richardson, Trustee.....	163	47	47 00
E. A. Richardson, Trustee.....	164	50	50 00
E. A. Richardson, Trustee.....	165	50	50 00
E. A. Richardson, Trustee.....	168	50	50 00
E. A. Richardson, Trustee.....	167	50	50 00
E. A. Richardson, Trustee.....	168	100	100 00
E. A. Richardson, Trustee.....	169	100	100 00
E. A. Richardson, Trustee.....	171	100	100 00
E. A. Richardson, Trustee.....	175	50	50 00
E. A. Richardson, Trustee.....	176	50	50 00
E. A. Richardson, Trustee.....	177	40	40 00
E. A. Richardson, Trustee.....	178	1	10 00
E. A. Richardson, Trustee.....	183	10	10 00
E. A. Richardson, Trustee.....	184	3	3 00
E. A. Richardson, Trustee.....	186	100	100 00
E. A. Richardson, Trustee.....	203	2	50 00
E. A. Richardson, Trustee.....	204	50	50 00
E. A. Richardson, Trustee.....	212	847	847 00
E. A. Richardson, Trustee.....	213	100	100 00
E. A. Richardson, Trustee.....	219	100	100 00
E. A. Richardson, Trustee.....	221	100	100 00
E. A. Richardson, Trustee.....	223	100	100 00
E. A. Richardson, Trustee.....	226	50	50 00
E. A. Richardson, Trustee.....	233	100	100 00
E. A. Richardson, Trustee.....	244	500	500 00
E. A. Richardson, Trustee.....	245	58	58 00
E. A. Richardson, Trustee.....	246	100	100 00
E. A. Richardson, Trustee.....	247	100	100 00
E. A. Richardson, Trustee.....	249	100	100 00
E. A. Richardson, Trustee.....	251	100	100 00
E. A. Richardson, Trustee.....	250	3610	3600 00
T. B. Kent, Trustee.....	135	200	200 00
T. B. Kent, Trustee.....	136	200	200 00
T. B. Kent, Trustee.....	137	200	200 00
T. B. Kent, Trustee.....	139	100	100 00
T. B. Kent, Trustee.....	140	100	100 00
T. B. Kent, Trustee.....	141	100	100 00

Names.	No. Certificate.	No. Shares.	Amount.
Neal, Chas S. Trustee....	49	100	10 00
Neal, Chas S. Trustee....	54	100	10 00
Ricketts, A. H. Trustee....	78	60	5 00
Ricketts, A. H. Trustee....	81	100	10 00
Ricketts, A. H. Trustee....	86	100	10 00
Ricketts, A. H. Trustee....	98	100	10 00
Ricketts, A. H. Trustee....	173	20	2 00
Ricketts, A. H. Trustee....	175	20	2 00
Ricketts, A. H. Trustee....	184	20	2 00
Ricketts, A. H. Trustee....	191	20	2 00
Ricketts, A. H. Trustee....	194	10	1 00
Ricketts, A. H. Trustee....	198	10	1 00
Ricketts, A. H. Trustee....	200	10	1 00
Thomas, D. L. Trustee....	330	100	100 00
Thomas, D. L. Trustee....	331	100	100 00
Thomas, D. L. Trustee....	333	160	160 00
Thomas, D. L. Trustee....	334	160	160 00
Thomas, D. L. Trustee....	335	1300	130 00
Thomas, D. L. Trustee....	337	2300	230 00
Thomas, D. L. Trustee....	338	2425	242 50
Thomas, D. L. Trustee....	339	1400	140 00
Thomas, D. L. Trustee....	360	1000	100 00
Verdinal, B. F. Trustee....	5	100	10 00

And in accordance with law, and an order of the Board of Directors, made on the 5th day of December, 1872, so many shares of each parcel of said stock as may be necessary, will be sold at public auction, at the office of the Company, room 21, Hayward's Building, 419 California street, San Francisco, Cal., on the 31st day of January, 1873, at the hour of 1 o'clock p. m. of said day, to pay said delinquent assessment thereon, together with costs of advertising and expenses of sale.

H. C. KIBBE, Secretary.
Office, Room 21, Hayward's Building, 419 California street, San Francisco, California. j418

POSTPONEMENT.—The above sale is hereby postponed until February 15th, 1873, at the same hour and place. By order of the Board of Directors.

H. C. KIBBE, Secretary.
Mount Jefferson Milling and Mining Company.—Location of works, First Garoto, Tuolumne County, California.

Notice.—There are delinquent upon the following described stock, on account of assessment levied on the 18th day of December, 1872, the several amounts set opposite the names of the respective shareholders as follows:

Names.	No. Certificate.	No. Shares.	Amount.
Bowdell, S. B. Trustee....	47	1000	\$150 00
Deano, C. L. Trustee....	95	50	7 50
Galloway, W. T. Trustee....	61	150	22 50
Lewis, L. J. Trustee....	6	500	75 00
Lewis, L. J. Trustee....	6	500	75 00
Lewis, L. J. Trustee....	48	700	105 00
Lewis, L. J. Trustee....	44	700	105 00
Lewis, L. J. Trustee....	66	100	15 00
Lewis, L. J. Trustee....	95	100	15 00
Lewis, L. J. Trustee....	110	100	15 00
Richardson, E. A. Trustee....	17	1380	207 00
Richardson, E. A. Trustee....	31	200	30 00
Richardson, E. A. Trustee....	32	200	30 00
Richardson, E. A. Trustee....	33	150	22 50
Richardson, E. A. Trustee....	35	150	22 50
Richardson, E. A. Trustee....	71	100	15 00
Richardson, E. A. Trustee....	73	100	15 00
Richardson, E. A. Trustee....	77	100	15 00
Richardson, E. A. Trustee....	81	200	30 00
Richardson, E. A. Trustee....	84	200	30 00
Richardson, E. A. Trustee....	89	50	7 50
Richardson, E. A. Trustee....	107	300	45 00
Richardson, E. A. Trustee....	112	100	15 00
Richardson, E. A. Trustee....	113	100	15 00
Simmons, Wm. Trustee....	100	190	28 50
Simmons, Wm. Trustee....	101	10	1 50
White, U. H. Trustee....	111	100	15 00
White, U. H. Trustee....	114	100	15 00
White, U. H. Trustee....	115	100	15 00

And in accordance with law, and an order of the Board of Directors, made on the 15th day of December, 1872, so many shares of each parcel of said stock as may be necessary, will be sold at public auction, at the office of the Company, No. 418 California street, San Francisco, Cal., on the 17th day of February, 1873, at the hour of 2 o'clock p. m. of said day, to pay said delinquent assessment thereon, together with costs of advertising and expenses of sale.

J. W. CLARK, Secretary.
Meadow Valley East Extension M. Co.—Location of works, Ely Mining District, Nevada.

Notice is hereby given that at a meeting of the Board of Trustees of said Company, held on the 15th day of January, 1873, an assessment of ten cents per share was levied upon the capital stock of said Company, payable immediately to the Secretary, at the office of the Company, Room 3, 419 California street, San Francisco, Cal. Any stock upon which said assessment shall remain unpaid on the 25th day of February, 1873, shall be deemed delinquent, and will be sold at public auction, and unless payment shall be made before, will be sold on Friday, the 21st day of March, 1873, to pay the delinquent assessment, together with costs of advertising and expenses of sale. By order of the Board of Trustees.

T. W. COLBURN, Secretary.
Office, Room 3, 419 California street, San Francisco, California. j418

Mohave Consolidated Gold and Silver Mining Co. Location of works, Wallapai Mining District, Mohave County, Territory of Arizona.

Notice is hereby given that at a meeting of the Board of Trustees of said Company, held on the 7th day of January, 1873, an assessment of ten cents per share was levied upon the capital stock of said Company, payable immediately to the Secretary, at the office of the Company, Room 3, 419 California street, San Francisco, Cal. Any stock upon which said assessment shall remain unpaid on the 25th day of February, 1873, shall be deemed delinquent, and will be sold at public auction, and unless payment shall be made before, will be sold on Friday, the 21st day of March, 1873, to pay the delinquent assessment, together with costs of advertising and expenses of sale. By order of the Board of Trustees.

T. E. JEWELL, Secretary.
Office, Room 3, 419 California street, San Francisco, California. j418

The Metropolitan Gas Company.—Location of works, San Francisco, in the County of San Francisco, State of California.

Notice is hereby given that at a meeting of the Trustees of said Company, held this 15th day of January, 1873, an assessment of Five (\$5) Dollars per share, gold coin, was levied upon the capital stock of said Company, payable on or before the 21st day of February, 1873, to the Secretary of said Company, at the office of said Company, No. 304 Pine street, San Francisco, Cal. Any stock upon which said assessment shall remain unpaid on the 21st day of February, 1873, shall be deemed delinquent, and will be sold at public auction, and unless payment shall be made before, will be sold on Friday, the 21st day of March, 1873, to pay the delinquent assessment, together with costs of advertising and expenses of sale.

A. D. BELL, Secretary.
Office, No. 304 Pine street, San Francisco, Cal. j25-1

Noonday Silver Mining Company.—Location of works, White Pine District, Nevada.

Notice is hereby given that at a meeting of the Board of Trustees of said Company, held on the 15th day of January, 1873, an assessment of No. 15 of Twenty Cents per share was levied upon the capital stock of said Company, payable immediately, in United States gold coin, to the Secretary, at the office of the Company, No. 26 Hayward's Building, 419 California street, San Francisco, California. Any stock upon which said assessment shall remain unpaid on Saturday, February 22d, 1873, shall be deemed delinquent and will be sold at public auction, and unless payment shall be made before, will be sold on Monday, the 17th day of March, 1873, at 1 o'clock p. m. to pay the delinquent assessment, together with costs of advertising and expenses of sale. By order of the Board of Trustees.

J. M. MAGUIRE, Secretary.
Office, Room 26, Hayward's Building, 419 California street, San Francisco, California. j25

Ophir Copper, Silver and Gold Mining Company.—Location of works, Ophir, Placer County, California.

Notice.—There are delinquent upon the following described stock, on account of assessment levied on the 19th day of December, 1872, the several amounts set opposite the names of the respective shareholders as follows:

Names.	No. Certificate.	No. Shares.	Amount.
W. E. Brandt.....	315	50	\$ 15 00
Richard Speyer.....	309	24 3/4	7 33 1/2
H. C. Swain.....	318	50	15 00

Names.	No. Certificate.	No. Shares.	Amount.
W. J. Kip, Jr.....	8	500	50 00
W. J. Kip, Jr.....	9	500	50 00
W. J. Kip, Jr.....	10	500	50 00

Names.	No. Certificate.	No. Shares.	Amount.
Geo P Rogers.....	12	75	7 50
Chas F Brown.....	21	300	60 00
James H. Garmish, Trustee....	26	300	30 00

Names.	No. Certificate.	No. Shares.	Amount.
R. G. Brush.....	27	1000	100 00
Wallace Everson, Trustee....	29	600	60 00
H. C. Swain, Trustee.....	31	500	50 00

Names.	No. Certificate.	No. Shares.	Amount.
H. C. Swain, Trustee.....	32	500	50 00
H. C. Swain, Trustee.....	33	302	30 20
Chas F Brown, Trustee.....	34	300	30 00

And in accordance with law and an order of the Board of Directors, made on the 19th day of December, 1872, so many shares of each parcel of said stock as may be necessary, will be sold at public auction at the office of the Company, room 2, Express Building, 402 Montgomery street, San Francisco, California, on the 17th day of January, 1873, at the hour of one o'clock p. m. of said day, to pay said delinquent assessment thereon, together with costs of advertising and expenses of sale.

O. H. BOGART, Secretary.
Office, room 2, Express Building, 402 Montgomery street, San Francisco, California. j41

Piermont Milling and Mining Company.—Location of works, Nevada. Location of principal place of business, San Francisco, California.

Notice is hereby given, that at a meeting of the Board of Directors, held on the twenty-fifth day of January, A. D. 1873, an assessment of No. 6 of fifty cents per share was levied upon the capital stock of said Company, payable immediately in United States gold coin, to the Secretary, at the office of said Company.

Any stock upon which said assessment shall remain unpaid on the 15th day of February, 1873, will be delinquent, and advertised for sale at public auction, and unless payment is made before, will be sold on the 1st day of March, 1873, to pay the delinquent assessment, together with costs of advertising and expenses of sale. By order of the Directors.

J. W. CLARK, Secretary.
Office, 418 California Street, San Francisco. feb-15

Rail Road Consolidated Mining Company.—Location of works, Railroad District, Elko County, State of Nevada.

Notice is hereby given, that at a meeting of the Board of Directors of said Company, held on the 7th day of January, 1873, an assessment of fifteen (15) cents per share was levied upon the capital stock of said Company, payable immediately in United States gold and silver coin, to the Secretary, at the office of the Company, No. 328 Montgomery street, Room No. 10.

Any stock upon which said assessment shall remain unpaid on the 15th day of February, 1873, will be delinquent, and advertised for sale at public auction, and unless payment is made before, will be sold on Thursday, the 21st day of March, 1873, to pay the delinquent assessment, together with costs of advertising and expenses of sale. By order of the Directors.

JOSEPH P. NOURSE, Secretary.
Office, Room No. 10, No. 328 Montgomery street, San Francisco. j41

Scorpion Silver Mining Company.—Location of works, Virginia City, Storey County, Nevada. Principal place of business, San Francisco, California.

Notice is hereby given, that at a meeting of the Directors of said Company, held on the 15th day of February, 1873, an assessment of fifty cents per share was levied upon the capital stock of the corporation, payable immediately in United States gold and silver coin, to the Secretary, at the office of the Company, Room 3, 419 California street, San Francisco, Cal. Any stock upon which said assessment shall remain unpaid on the 25th day of February, 1873, shall be deemed delinquent, and will be sold at public auction, and unless payment shall be made before, will be sold on Saturday, the 23rd day of March, 1873, to pay the delinquent assessment, together with costs of advertising and expenses of sale. By order of the Directors.

J. W. CLARK, Secretary.
Office, 418 California Street, San Francisco, California. feb-15

Silver Wave Mining Company.—Location of works, White Pine District, Nevada. Location of principal place of business, San Francisco, California.

Notice is hereby given, that at a meeting of the Board of Directors, held on the 25th day of January, 1873, an assessment of No. 16 of fifty cents per share was levied upon the capital stock of the corporation, payable immediately in United States gold coin, to the Secretary, at the office of said Company. Any stock upon which this assessment shall remain unpaid on the 15th day of February, 1873, will be delinquent, and advertised for sale at public auction, and unless payment is made before, will be sold on the 8th day of April, A. D. 1873, to pay the delinquent assessment, together with costs of advertising and expenses of sale. By order of the Directors.

J. W. CLARK, Secretary.
Office, 418 California Street, San Francisco, California. feb-15

Spring Mountain Tunnel Company.—Location of works, Lincoln County, Nevada.

Notice.—There are delinquent upon the following described stock, on account of assessment (No. 4) levied on the 15th day of December, 1872, the several amounts set opposite the names of the respective shareholders as follows:

Names.	No. Certificate.	No. Shares.	Amount.
F. A. Munroe.....	31	25	\$ 5 00
Ann O'Neill.....	92	1333	266 50
Jas T Dean.....	9	1000	200 00

Names.	No. Certificate.	No. Shares.	Amount.
Jas T Dean.....	132	180	30 00
David Leahy.....	123	240	60 00
F. M. Freund.....	109	5	1 00

Names.	No. Certificate.	No. Shares.	Amount.
F. M. Freund.....	110	5	1 00
F. M. Freund.....	186	25	5 00
O. F. Webster, Trustee.....	190	100	20 00

Names.	No. Certificate.	No. Shares.	Amount.
J. M. Huntington, Trustee....	78	50	10 00
J. M. Huntington, Trustee....	136	50	10 00
J. M. Huntington, Trustee....	194	50	10 00

Names.	No. Certificate.	No. Shares.	Amount.
J. M. Huntington, Trustee....	243	50	10 00
O. H. Hallett, Trustee.....	106	5	1 00
Geo H Hallett, Trustee.....	107	5	1 00

Names.	No. Certificate.	No. Shares.	Amount.
M. O. Houghton.....	141	20	4 00
W. Worcester.....	155	100	20 00
W. Worcester.....	156	100	20 00

And in accordance with law and an order of the Board of Directors, made on the 17th day of December, 1872, so many shares of each parcel of said stock as may be necessary, will be sold at public auction, at the office of the Company, room 37, new Merchants' Exchange Building, 419 California street, San Francisco, California, on Monday, the 17th day of February, 1873, at the hour of 12 o'clock a. m. of said day, to pay said delinquent assessment thereon, together with costs of advertising and expenses of sale.

J. M. HUNTINGTON, Secretary.
Office, 37 New Merchants' Exchange, California street, San Francisco, California. j41

Spring Mount Mining Company.—Location of works, Ely Mining District, Nevada.

Notice is hereby given, that at a meeting of the Board of Trustees of said Company, held on the 15th day of January, 1873, an assessment of twenty-five cents (25 cents) per share was levied upon the capital stock of said Company, payable immediately in United States gold and silver coin, to the Secretary, at the office of the Company, room 3, No. 419 California street, San Francisco, California. Any stock upon which said assessment shall remain unpaid on Tuesday, February 25th, 1873, shall be deemed delinquent, and will be sold at public auction, and unless payment shall be made before, will be sold on Friday, March 21st, 1873, to pay the delinquent assessment, together with costs of advertising and expenses of sale. By order of the Board of Trustees.

T. W. COLBURN, Secretary.
Office, Room 3, No. 419 California street, San Francisco, California. j41

Stanford Silver Mining Company.—Location of works, Sierra District, Humboldt County, State of Nevada.

Notice is hereby given, that at a meeting of the Board of Trustees of said Company, held on the 31 day of January, A. D. 1873, an assessment of five cents per share was levied upon the capital stock of said Company, payable immediately in United States gold coin, to the Secretary, at the office of the Company, Room 26, Hayward's Building, California street, San Francisco, California.

Any stock upon which said assessment shall remain unpaid on Saturday, February 23rd, 1873, shall be deemed delinquent, and will be sold at public auction, and unless payment shall be made before, will be sold on Monday, the 3rd day of March, A. D. 1873, to pay the delinquent assessment, together with costs of advertising and expenses of sale. By order of the Board of Trustees.

H. B. CONGDON, Secretary.
Office, Room 26, Hayward's Building, 419 California street, San Francisco, California. j41

State of Maine Mill and Mining Company.—Location of works, Andover County, California.

Notice is hereby given, that at a meeting of the Board of Directors of said Company, held on the 23rd day of January, 1873, an assessment of No. 2 of five cents per share was levied upon the capital stock of said Company, payable immediately in United States gold and silver coin, to the Secretary, at the office of the Company, 306 Montgomery street, San Francisco, Cal. Any stock upon which said assessment shall remain unpaid on the 24th day of February, 1873, will be delinquent, and will be sold at public auction, and unless payment shall be made before, will be sold on Monday, the 17th day of March, 1873, to pay the delinquent assessment, together with costs of advertising and expenses of sale. By order of the Board of Directors.

H. B. CONGDON, Secretary.
Office, 306 Montgomery street, San Francisco, Cal. j41

Table Mountain Alpha Mining Company.—Location of principal place of business, San Francisco, California. Location of works, Table Mountain District, Tuolumne County, California.

Notice is hereby given, that at a meeting of the Directors, held on the 31 day of February, 1873, an assessment (No. 1) of twenty-five cents per share was levied upon the capital stock of the corporation, payable immediately in United States gold coin, to the Secretary, at the office of the Company, No. 438 California Street, San Francisco, California.

Any stock upon which said assessment shall remain unpaid on the 10th day of March, 1873, will be delinquent, and advertised for sale at public auction, and unless payment is made before, will be sold on Wednesday, the 24th day of April, 1873, to pay the delinquent assessment, together with costs of advertising and expenses of sale.

W. M. L. USICK, Secretary.
Office, No. 438 California Street, San Francisco, California. feb-15

Yule Gravel Mining Company.—Location of works, Yule Claims, Township No. 8, Placer County, California.

Notice.—There are delinquent upon the following described stock, on account of assessment (No. 2,) levied on the 18th day of December, 1872, the several amounts set opposite the names of the respective shareholders, as follows:

Names.	No. Certificate.	No. Shares.	Amount.
Bixby, J. O.....	407	7	\$ 1 40
Balding, Owen.....	347	35	7 00
Bryant, John.....	418	20	4 00

Names.	No. Certificate.	No. Shares.	Amount.
Canlier & Everett, Trustee....	322	10	2 00
Cope, G. W. Trustee.....	135	50	10 00
Dore, Benj, Trustee.....	91	50	10 00

Names.	No. Certificate.	No. Shares.	Amount.
Dore, Benj, Trustee.....	92	50	10 00
Dore, Benj, Trustee.....	325	20	4 00
Dore, Benj, Trustee.....	130	20	4 00

Names.	No. Certificate.	No. Shares.	Amount.
Dore, Benj, Trustee.....	409	16	3 20
Folsom, Geo T.....	339	10	2 00
Gummer, W. P.....	304	10	2 00

Names.	No. Certificate.	No. Shares.	Amount.
Goodyear & Blake.....	316	5	1 00
Goodyear & Blake.....	330	50	10 00
Goodyear & Blake.....	343	50	10 00

Names.	No. Certificate.	No. Shares.	Amount.
Holmes & Co., A. Trustee....	349	30	6 00
Holmes & Co., A. Trustee....	344	15	3 00
Hymannu, S. Trustee.....	382	20	4 00

Names.	No. Certificate.	No. Shares.	Amount.
Hussey, J. L. Trustee.....	371	10	2 00
King, J. L.....	276	60	12 00
Louenber, S. Trustee.....	105	50	10 00

Names.	No. Certificate.	No. Shares.	Amount.
Louenber, S. Trustee.....	243	50	10 00
Louenber, S. Trustee.....	415	50	10 00
Logan & Edelen, Trustee....	399	20	4 00

Names.	No. Certificate.	No
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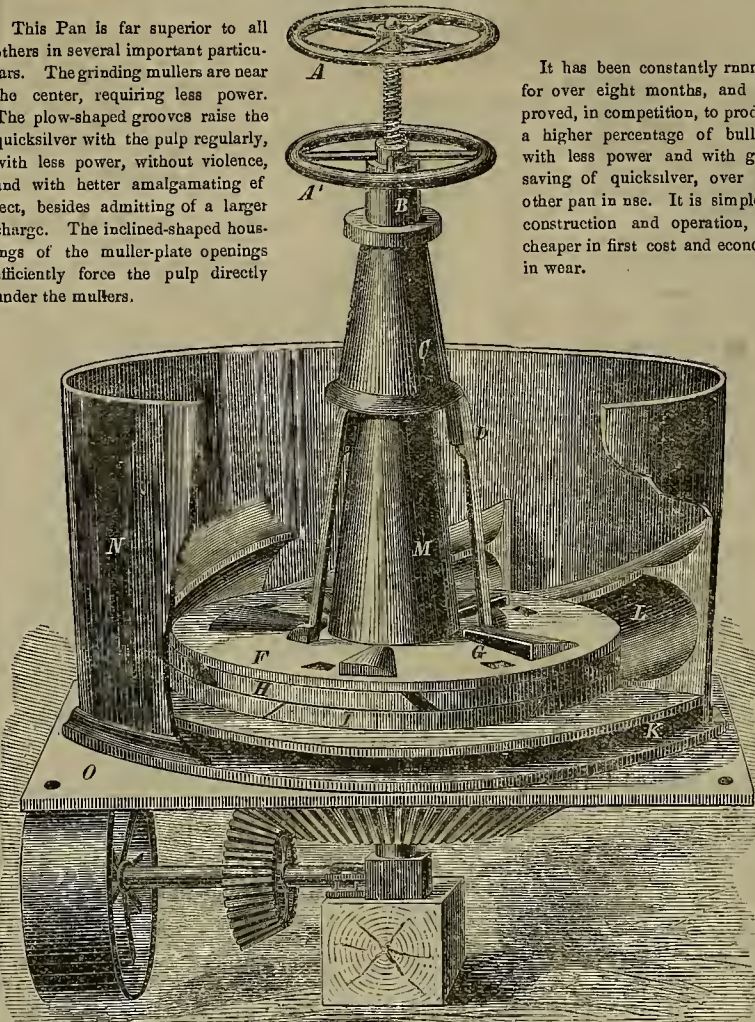
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22v25-3m

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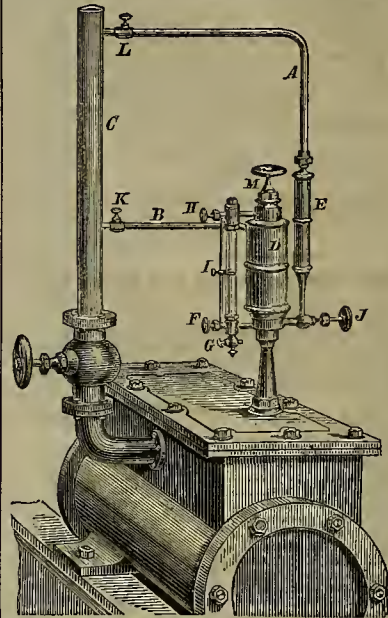
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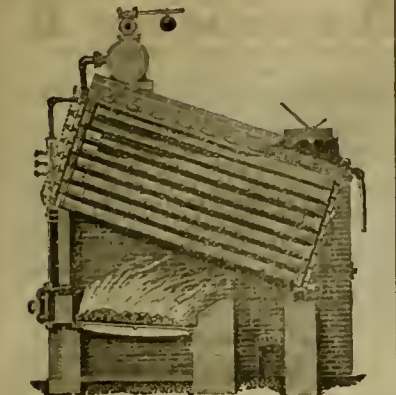
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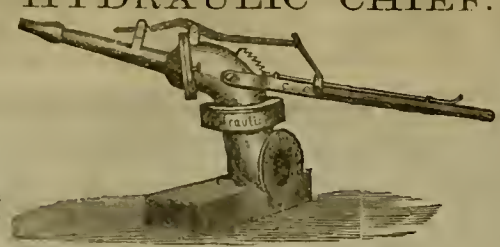


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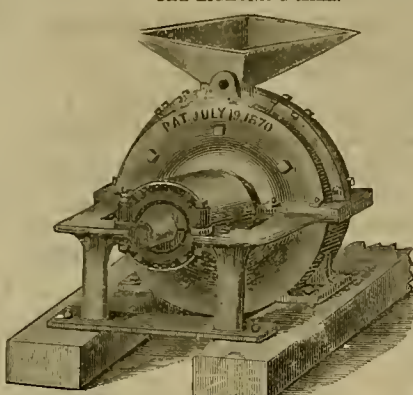
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E, pin or regulator, extending into rail; D, steel wire,
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Their construction is of the simplest kind, thus making
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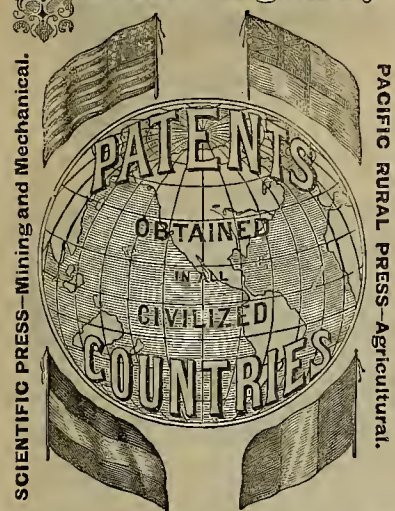
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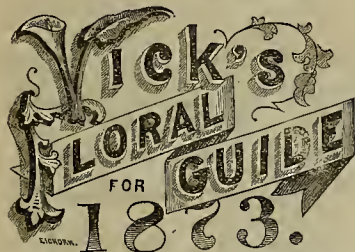
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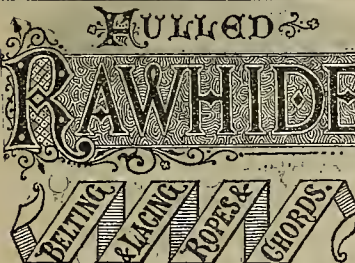
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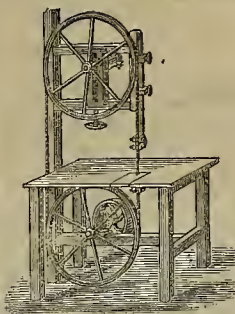
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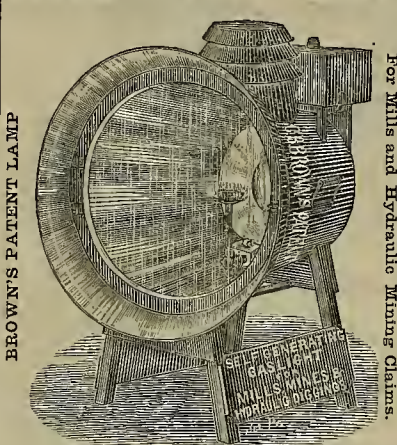
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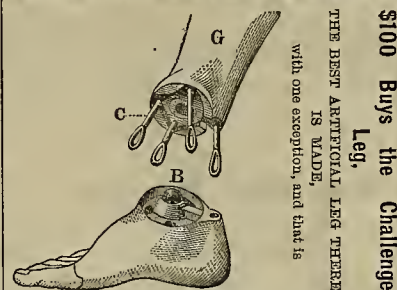
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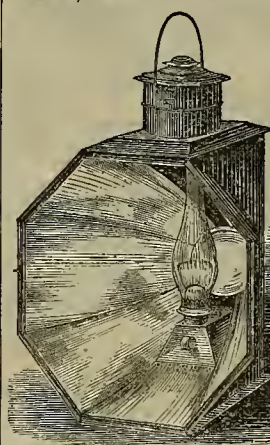
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IMPORTANT TO
Mining Companies, Civil Engineers, Contractors, Etc.

The system of transporting material, such as Ores, from the mine to the mill, Earths for embankments, Rock from quarries, etc., by means of steel wire rope, has been well tested and found more economical, advantageous and reliable than any other method of transportation; and to the annexed certificates in connection therewith I beg to call the attention of those interested:

EUREKA, Nevada, July 10, 1872.
T. M. MARTIN—My dear sir: On your leaving for San Francisco, it gives me great pleasure to hand you my written acceptance of the HALLIDIE TRAMWAY put up by you upon our mine in Freiberg.
It is a perfect success, discharging ten tons of ore per hour with two men's labor. It is perfectly simple in construction, and as far as I can judge, there is nothing about it to ever get out of order—nothing to wear out. While ore requires but about two thousand five hundred feet of wire rope, I can see no reason why the line could not be extended almost indefinitely with equally happy results. Again, the carrying capacity might be doubled or quadrupled if desired. After several weeks trial upon our mine, the unanimous verdict of all who have seen it is a complete, unquestioned success. If this can be of any service to you, use it in any way you think proper. Very respectfully, C. C. GOODWIN.

EMMA HILL CONSOLIDATED MINING CO.,
Little Cottonwood, Utah.
Superintendent's Office, Sept. 23, 1872.
T. M. MARTIN, Esq.—Sir: The Ropeway constructed by you (HALLIDIE'S PATENT) for the Emma Hill Consolidated Mining Company, has been built in a most substantial and workmanlike manner, and is at this time in splendid working condition. I most cheerfully accept the work for the Company, and recommend it to others wishing a sure and speedy transit for ores over places impracticable for wagon roads, etc. Respectfully,
L. W. COLBATH, Superintendent.

EMMA HILL CONSOLIDATED MINING CO.,
Superintendent's Office, Oct. 23, 1872.
T. M. MARTIN, Esq.—Sir: With pleasure I testify to the fact that the endless wire Ropeway (HALLIDIE'S PATENT) built by you for this Company, has been for a month or more in daily operation, and has been built in a most substantial and workmanlike manner, and is at this time in splendid working condition. I most cheerfully accept the work for the Company, and recommend it to others wishing a sure and speedy transit for ores over places impracticable for wagon roads, etc. Respectfully,
WM. O. CAMPBELL, Clerk of Co.

The Vallejo Ropeway.
The Vallejo Tunnel Company's Tramway in Little Cottonwood, built on the HALLIDIE PATENTED PLAN, is a complete success. It is between 2,300 and 2,400 feet in length, and is supported by three iron towers. The fall in this distance is about 60 feet, and the wire rope, which is three-fourths of an inch in diameter, will safely and easily deliver one hundred tons in six hours. The machinery is automatic, loading and unloading the sacks or barrels. About one ton and a half can be sent down at one time. The stations are about two hundred feet apart, and the entire apparatus is strong and safe. As the wire rope is elevated about forty feet above the surface of the hill, the Tramway can be worked all winter long, without the slightest trouble.—Utah Mining Journal, Salt Lake, Sept. 23, 1872.

Mining Companies and others desiring to negotiate for the erection of this system of Ropeway, can communicate with me personally, or through Postoffice Box 964.
A. S. HALLIDIE, Patentee,
112 and 114 California Street, San Francisco.
Wire Rope for hoisting from mines, transmitting power, ship rigging, etc., of all kinds and sizes, on hand and made to order.
Wire of all kinds and descriptions, furnished at lowest rates.
A. S. HALLIDIE, 112 and 114 California St.

MINING AND SCIENTIFIC PRESS.

An Illustrated Journal of Mining, Popular Science and Progressive Industry.

BY DEWEY & CO.,
Patent Solicitors.

SAN FRANCISCO, SATURDAY, FEBRUARY 15, 1873.

VOLUME XXVI.
Number 7

The Ewbank Ventilator.

(Written for the Press by A. BLATCHLEY.)

Our engraving represents the Ewbank ventilator applied to a mine, and an enlarged view on the left side of the engraving of the junction of the exhaust pipe of the steam engine and the upper end of the ventilating pipe. Unlike ordinary ventilators this one operates by suction, and is applicable only to mines which have a steam engine at the mouth of the shaft, or in its immediate vicinity.

This ventilator has no valves or wheels, and is simply a pipe extending from the point in the mine from which it is desirable to draw off the hot air to the mouth of the exhaust pipe of the steam engine, as shown in the cut. When the engine runs, the ventilator operates without any other power than what is otherwise lost in exhaust steam; when the engine is not running, of course the ventilator ceases acting. The pipe, which can be made of light sheet iron, or even of wood, if made air tight, should be as large as feasible—the larger the pipe the less the friction, and care should be taken to avoid sharp angles and to lay the pipe in a straight line as nearly as possible.

In placing this ventilator in a mine, the end of the pipe where the hot air enters, must be above or beyond where the workmen operate, as is shown at A, and H. A pipe placed, as shown in the cut, would cause a current of air to pass from the shaft along the drift and up the winze to H. If it could be laid along the dotted line H, H, it would work more efficiently, but it usually has to be applied as shown in the cut. If it is placed as shown at D, it will draw up all of the fresh air which comes from the shaft, and the hot air from the opening above, and make the drift hotter than it was before the ventilator was put in. By elevating the end of the pipe into the opening above, the current of fresh air from the shaft will be increased by the amount of hot air passing out of the ventilator.

This was tried in one of the hottest and deepest mines in Washoe where a large amount of old workings were connected with the place where the miners were at work; a Root blower was used to supply fresh air, and before the ventilator was put in, it served to cool the drift so that the miners could work; but after the ventilator was introduced, it drew up not only all of the fresh air from the blower, but drew the hot air from the old workings, so that in a half hour the miners had to quit the drift.

At A, A, is shown the upper end of the ventilating pipe with the exhaust pipe from the steam engine passing through it. According to Ewbank the enlargement and contractions of the pipe shown in the cut are essentially necessary to its successful working, especially the contraction at the mouth of the exhaust pipe. It is probable that for pipes of small size the cylindrical form is as good as any, but for pipes of more than one inch in diameter the effect would be greatly increased by flattening both pipes at the upper end of the exhaust pipe, as for instance, reducing a circular pipe of four inches in diameter to one inch in one direction and nearly sixteen in the other. This would increase its power as twelve is to thirty-four.

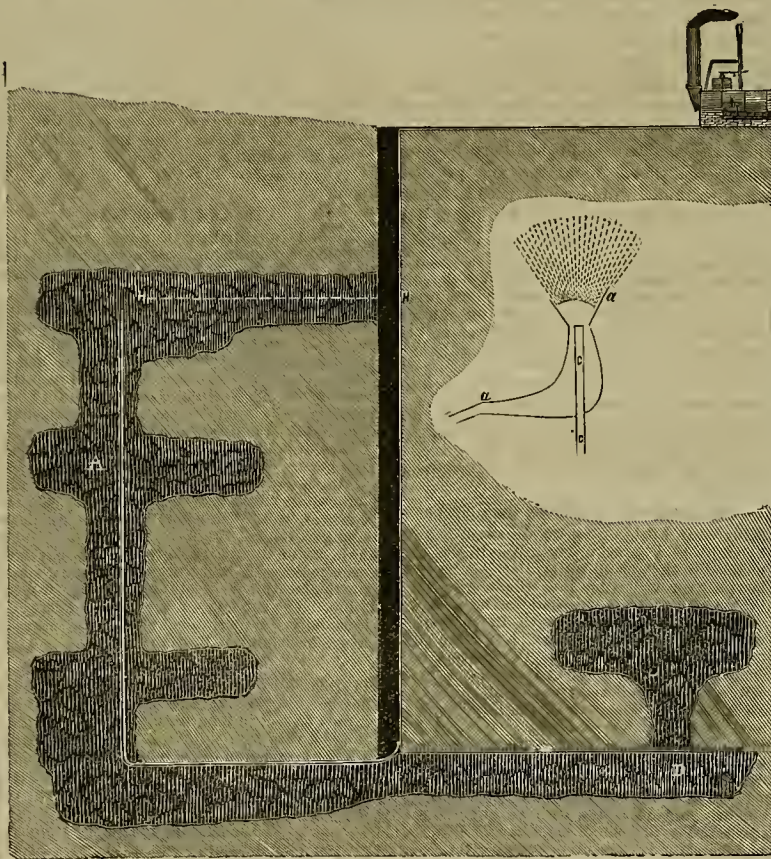
In a large exhaust pipe only the steam near the sides of the pipe produces any useful effect, while the great body of steam in the center of the pipe produces no effect.

As this ventilator is self-acting, or uses power that otherwise would be lost, and is so simple that any one can make and put it in a mine, and as it has an enormous capacity it ought to come into general use in all deep and extensive mines,

Foundry Work.

The Fulton Foundry of this city is at work on the iron work for the new building of the London and San Francisco bank, which will be erected on the corner of Leidesdorff and California streets. There are in this job about 275 tons of castings and the work is all to be finished like a piece of machinery. There are 70 odd columns which are to be turned in a lathe and when finished will not look at all like an ordinary house front. The building will probably be the finest one yet erected in San Francisco. There are to be three stories and a basement, and the portions which front on California and Leidesdorff streets will all be made of iron. The carving alone on the patterns will cost upward

At the Vulcan Foundry which is now well under way again, they are doing considerable repair and sawmill work. They are making a steam engine, shafting, gearing, etc., for the Golden Gate Flour Mill, and also casting two water gates for the San Mateo Water Works. A cylinder, piston, etc., 16 inches in diameter and 42-inch stroke is being made for an engine at the Gould & Curry mine; also a steam pumping engine 12x24 for a mine in Calaveras county. They are doing the iron work on two of Hays' patent fire escapes for the Kimball Carriage Manufacturing Company, one of which goes East and the other will be used here. A number of moulds are being made for the Selby lead works, at which place they have considerable refuse metal unfit for ordinary purposes,



EWBANK'S METHOD OF VENTILATING MINES.

of \$2,000. The entrance, judging from the plans, will be very handsome. There are two figures, 7 feet high, in the position in which we usually see Atlas depicted, except that instead of a World, they support heavy ornamental carved work of a fanciful character, which holds up the corner of the building. A pair of lions, between which is a shield, are placed over these, above which are heavy iron columns the length of each separate story. This turning off castings and finishing them up like machinery is a new wrinkle and one which everybody can not afford to indulge in. It will take about six months to finish the iron work.

At this foundry they are also making two Brodie Crushers to go to Mexico, and have just shipped to the same place, a 5-stamp mill all complete with three Varney pans and one settler. They are building an engine 16x36 for F. P. and J. A. Hooper at Trinidad, and making castings for settlers and drying kiln for the Monitor-Belmont Mining company.

which they intend making into sash weights. These five moulds will contain six weights at a time. Some car work and repairing is being done for the Central street railroad in this city.

NARROW-GAUGE.—A Portland (Oregon) dispatch says: Articles of incorporation have been filed by the Narrow-Gauge Railroad Company for the purpose of building a narrow-gauge railroad between Tillamook and some connecting point with the Oregon Central Railroad near the north end of Winter Lake.

Reliable information received in Elko confirms the report that 25 miles of iron has been purchased in New York for the Eastern Nevada narrow-gauge railroad to Pioche, a portion of which will arrive next week. The survey commences as soon as the weather will permit.

OREGON COAL.—The Seattle Coal Company's mine ship an average of 130 tons of coal per day. It is estimated that this year Bellingham Bay will ship 30,000 tons. We want all we can get.

Efflorescence of Silver.

The following interesting paper on the efflorescence of silver was recently read before the San Francisco Microscopical Society, by Guido Kustel, the well-known mining Engineer and Metallurgist. Mr. Kustel remarked: There is a peculiarity observable in some silver minerals, principally of sulphurets, when small particles are melted into a globule on charcoal before the blow-pipe. After being melted to a perfectly spherical form, the blowing is stopped, and the globule will appear coated with crystalline metallic silver on cooling. The minerals exhibiting the phenomenon are the following: silver glance, selenide of silver, enciarite, stephanite, brittle silver ore (melanglance) margyrite and rich fahlerz. The petzite (from Melone's mine), although amongst the silver minerals, emits only the pure gold in shape of microscopical globules before the mineral melts. Under the microscope the efflorescence of silver appears wonderfully beautiful, but the interesting part in it is, that different minerals show a different aggregation of silver particles on the surface of the globules; and so characteristic that in most instances there is no difficulty in recognizing the mineral from the specialty of the crystalline silver and color of the globule in a minute's time. Only minerals rich in silver emit it, generally over thirty per cent., but not all. Antimony prevents the appearance of silver. So, for instance, margyrite would not show any silver until the antimony was driven out by longer blowing. Rapid cooling, by touching the globule with a needle or some other metallic instrument, increases or creates the efflorescence.

The different appearances of the silver, as observed under the microscope, is about as follows: Silver glance shows isolated round flowers, like stars, often crowded together. Silver-copper glance (stephanite), if very rich (fifty per cent. silver), exhibits almost the same characteristics; poorer specimens emit the silver in a shape resembling fine moss. Both minerals give dark steel-blue globules. The last mineral, with copper largely prevalent, coats the globule with copper, which oxidizes on the surface, causing a dull, rough appearance. Melanglance gives a lead-grny, lustrous globule, showing, if cooled forcibly, from the touching point, long radial threads adhering to the surface of the globule. Selenide of silver makes long, beautiful crystalline leaves. Enciarite (selenide of silver and copper) emits the silver in isolated, thick, upright threads, like the natural silver threads. Margyrite, after the antimony is blown off, displays brilliant rainbow-colors during refrigeration; forcibly cooled, it throws out silver, resembling silver drops that fall in a melted condition on a floor, assuming a flat shape.

SAN FRANCISCO MICROSCOPICAL SOCIETY.—The annual meeting of this growing Society was held last week, when the annual election took place. Among the presentations was some infusorial earth containing rare forms of diatoms. The new seal of the Society was presented and adopted. A resolution was adopted increasing the limit of membership to fifty, on account of the number of applications. The following officers were unanimously elected for the ensuing year: Henry G. Hanks, President; Arthur B. Stout, M. D., Vice-President; C. Mason Kinne, Recording Secretary; Henry C. Hyde, Corresponding Secretary; D. P. Belknap, Treasurer.

A WOOLEN MILL is shortly to be erected at Windsor, Sonoma county, Cal.

Auriferous Gravel in Placer County.

Dr. J. M. Willey, at the last meeting of the California Academy of Sciences, read the following remarks on some points of interest in connection with the deposits of auriferous gravel in Placer county, Cal.:

Having had occasion in August last to visit the celebrated mining region, which centres in Forest Hill, I went with expectation of finding confirmation of the usual theory concerning the formation of this gravel deposit.

It is hardly necessary to say that the gravel beds of the central counties of California are supposed to present sufficient evidence of the existence of a system of large but extinct rivers, and that the course of these ancient rivers is believed to have been oblique, and often at right angles to that of the present streams, and to their tributaries flowing through the various cañons which have their sources on the western slopes of the Sierra Nevada range.

Although it is possible that such a mode of explanation may account for even so widely spread a deposit of gold-bearing gravel as exists in Placer and adjoining counties, I think there are certain features in this deposit difficult to reconcile with the theory of the ancient river system, and that a close study of the subject reveals a problem of a very complicated though interesting nature. The first thing which arrests the attention, after looking at the large excavations, which hydraulic power has worn in the gravel banks, in some places leaving precipices from one to two hundred feet deep, is the profusion of boulders of pure quartz which cover the worked out portions of the ground. These boulders lie on the bed-rock in some places many feet in depth.

At Forest Hill and Michigan Bluffs the eye is dazzled in the sunlight reflected from heaps of round quartz, some masses of which will measure several cubic yards.

The smaller boulders are in general washed away, but I looked with surprise at one portion of an unworked bank at Michigan Bluffs, observing that it was composed almost entirely of quartz fragments from pebble size upwards, all having the usual rounded or ovoid form.

There will be little doubt I think that we have here the origin of the gold, which occurs so plentifully in connection with the gravel of this section of country, but the question remains as to how the attrition has been performed which liberates it.

What tremendous powers have, in the first place, dislocated from their original casings the gold-bearing quartz ledges, and in the next, ground to so perfect a smoothness and rotundity the hardest specimens of white, blue and rose-colored quartz fragments?

Mere fluvial action, however violent, will not at all account for the first condition even if it does for the second. Granite, in the Placer county gravel beds, occurs only in boulders associated with the quartz and that sparingly, the bed-rock being universally a slate; and in this respect the difference between the placer diggings of Idaho Territory and those of central California is very remarkable. In Idaho the bed-rock is everywhere granite, and the ledges which have supplied the gold are often distinctly traceable, good diggings being found below them, as in Granite Gulch near Placerville, and none at all above.

To what then shall we refer the disruption in California of that primitive relationship of rocks which we find still remaining in Idaho?

Perhaps volcanic action may account for it, and in connection with this view I wish to present to the notice of the society a specimen of the peculiar substance called cement. This substance occurs very abundantly in distinct, and sometimes alternate, stratification with the gravel in most of the Placer County mines; in fact, in all of them which I had an opportunity of visiting. It does not, so far as I could see, mix with the gravel, but is often of such a depth and hardness as to seriously embarrass the operations of the miner. Being entirely barren it has sometimes to be blasted with powder or nitro-glycerine before the hydraulic stream will act upon it, and then adds greatly to the cost of hydraulic operations.

As will be observed it is a grayish white, and so homogeneous, apparently, in its nature, that the miners generally, though very ignorantly, call it pipeclay. Although this whitish color is the usual tint, I have observed it in some situations to be of various shades of brown.

Now, is this substance a volcanic ash, and if not, what is it?

I think the answer to this question carries with it a solution of much of the difficulty in accounting for the condition of things in central California. Admitting that this cement is a true product of volcanic eruption, the large extent of surface covered by it, and its frequent great depth would lead us to infer an enormous amount of volcanic activity, perhaps in connection with the elevation of the neighboring peaks of the Sierra Nevada range.

Mr. Hanks kindly afforded me a microscopic examination of the present specimen, and it appears to resolve itself into the three elements of granite,—quartz, mica, and feldspar. This is not an unusual condition of volcanic ash, and if my impression is correct, it is, with the addition of sulphur, exactly the analysis of the ash ejected in the recent eruption of Vesuvius.

But even considering it as settled that cement is a volcanic ash solidified by time and pressure, we have still two things to account for, one, the almost total disappearance of the granite, the other the levigation of the quartz.

After due consideration of the effects of pro-

longed action of the snrf on both salt and fresh water beaches, in the production of such gravel and boulders as we see in Placer county, I doubt whether the ancient river system can be taken into the question, or is so clearly unaceable. There is one other mode of explanation of most, if not all, the phenomena alluded to, which I think deserves attention. I refer to the grinding and comminuting power of glacial action.

Of all the forces of nature which effect transformation of the surface of the earth the progress of glaciers is among the most potent. Every year brings new proofs of the extent and importance of the changes effected by glacier movement, and perhaps investigation may show that there was a time in which, from the western slopes of the Sierra Nevada range proceeded icy masses, of a magnitude and weight sufficient to have crushed out and destroyed the original relationships of rock over which they travelled, and to have had much to do with, if they were not the principal cause of the disrupted and almost chaotic state of things in Placer county.

Resources of Utah.—Continued.

Some of the Principal Mines.

We continue these articles from the Salt Lake Tribune: The Wellington mine also in Little Cottonwood Cañon, is located one mile and a half southeast of Alta City, near the summit of the divide between Little Cottonwood and American Fork Cañons. The developments consist of an incline shaft two hundred feet in depth at an angle of about thirty-six degrees; also levels diverging from it approximating to eight hundred feet in length. A body of ore lately discovered is estimated to contain over 600 tons in sight, but of its ultimate extent no calculation has been yet made.

The character of ore is galena and carbonates, and its average assay value is \$90 in silver and fifty per cent. lead. The width of the vein proper is about thirty feet, having ore strata four feet thick following both foot and hanging walls, leaving twenty-two feet of crevice matter laying between those strata. The strata are composed of white spar interspersed with pockets and chambers of ore. The work of prospecting for the main body of ore has been remunerative, and paid all expenses up to the present time. About the first proximo a working tunnel will be commenced which is intended to strike the vein at a depth of 250 feet.

The object of the tunnel is to facilitate the working of the mine, and will be used for taking ore from the mine, instead of hoisting, and also for drainage purposes. The present ore body was discovered about one hundred feet from the surface. A lower level is being now run with a view of ascertaining the probable extent and value of the body. Connected with the mine is the Wellington furnace, which has a capacity of smelting twenty tons of ore per day. The property is owned by the Wellington Mining Company of San Francisco. Incorporated in January, 1872. W. N. Young is general Manager, and E. J. Field Superintendent.

The Davenport and Matilda Consolidation.

Situated in Little Cottonwood Cañon, is owned by John H. Ely and others. Work was commenced in the spring of 1871. This property has only recently come into the possession of the present owners, who paid a large sum of money for it, having full faith in its intrinsic value. The following work has been done towards development: On the Davenport a shaft and incline 280 feet in length, a tunnel 529 feet, two smaller shafts 65 feet, and 50 feet of drifts. Matilda shaft of the Davenport 110 feet, drifts 255 feet; making a total of 1,289 feet. The width of the vein of the Davenport is four and one-half feet, and that of the Matilda from four to twenty-three feet. The character of ore is free milling, composed of carbonates and chlorides, with an abundance of silver and a very small quantity of lead. Its average value is close upon \$150 per ton.

The capacity of the mine is from fifty to seventy-five tons per day.

The out-buildings, hoisting apparatus and appliances are very complete and substantial. A tramway 750 feet long connects the mines with the Grizzly Flat.

The Superintendent is Wm. B. Smith, Esq.

The Lexington Mine.

In Little Cottonwood Mining District, from which Lexington Hill takes its name, is one of the most promising veins in the District. It presents a vein of ore ten feet thick at a depth of ninety-five feet, assays from which show sixty ounces of silver and eight per cent. of lead. The ore is principally yellow carbonates. The mine has two shafts, one ninety-five feet and the other forty-five feet in depth. The claim contains in all 2,000 feet, and presents all the evidences of a true fissure vein. The ore is of a milling character. There are about 250 tons of ore on the dump. The property is owned by General P. E. Connor, Thomas Moore, George Pierson and others.

The El Dorado Mine

In Big Cottonwood Mining District, is located about one mile east of Fish Lake, on a line northeasterly from Emma Hill, and between it and the Uintah District. The mine is de-

veloped by a tunnel 175 feet in length, discovering a vein of ore twenty feet wide, composed of oxides and carbonates, and will yield twenty dollars to the ton of ore by milling process.

The Flagstaff Mine.

Situated in Uintah District, Parley's Park, is owned by the Park Silver Mining Company of San Francisco, organized in December, 1872; Capital stock \$500,000. The officers of the company are as follows: A. H. Morrison, President; F. A. Nims, Secretary; W. R. Morrison, Treasurer; W. H. Howland, Superintendent.

The mine was discovered by W. H. Howland on the 28th of May, 1871, and opened in the fall of the same year. A large amount of ore was taken from it, shipped to Salt Lake City, and sold to good advantage. The present assays show from \$75 to \$150 per ton of silver, and about sixty per cent. of lead.

In the early part of 1872 Dr. Vollum purchased of S. W. Howland and others an undivided four-fifth interest of the mine. Mr. Howland retained one-fifth interest. In the following December Dr. Vollum sold his interest to the present company, which is composed principally of residents of Michigan. From present indications this mine would appear to be one among the wealthiest in the Territory, it lies in close proximity to the following mines, which are all of them in good repute: The Ontario, McHenry, Pioneer, Walker and Webster. The location of the mine possesses many advantages; such, for instance, as an abundance of wood and water, the severity of winter will not interfere with or prevent its being successfully worked, and it is also in the immediate vicinity of a splendid agricultural district.

The Pioneer Mine.

In Uintah District, Parley's Park was discovered in October, 1871. The mine crosses the divide or ridge, which separates Parley's Park from Provo Valley, and is called Pioneer ridge after the mine. It lies at an altitude of over eight thousand feet above the level of the sea. The course of the lode crosses the backbone of the ridge at nearly a right angle. The location comprises fourteen hundred feet. A tunnel may be run entirely through the hill on the mine all the way; and both ends would still be above the bottom of the ravine. A line drawn from one entrance over the apex of the ridge down to the entrance of the tunnel on the other side would, with the tunnel for a base, form a perfect triangle. The lode on the summit is seven feet wide, and the ore ranges from sixty-seven to two hundred and twelve dollars per ton. The work so far consists of an open cut forty feet long and a shaft seventy feet deep. The property is owned by T. S. Moore and George Pierson.

The Last Chance Mine.

Situated in Bingham Canon, belongs to an English company and was incorporated in London with a capital of one hundred thousand pounds sterling.

The mine was only partially opened when the company took possession. Work was immediately afterwards commenced and developments continued. The mine is now well opened and shows a body of ore estimated at seven thousand tons. The ore in the upper level is free milling ore, giving assays of from sixty-five to one hundred and fifty ounces in silver and one ounce of gold to the ton. As the shaft was sunk, the nature of the ore changed to smelting ore, giving assays of from sixty-five to one hundred ounces in silver, and from thirty to sixty per cent. of lead, with some traces of gold. Six hundred tons of ore have been raised and are now on the dump. A furnace site has lately been purchased, and works will soon be erected for the treatment of all ore coming from the mine. The capacity of the mine is twenty-five tons daily. Superintendent, N. M. Maxwell, Esq.; Assistant, J. B. Stanford, Esq.

The Live Yankee Lode

Is situated in American Fork Cañon. This lode has been worked by a shaft 84 feet deep and a tunnel 55 feet in length. The development discloses a vein over 40 feet wide of vein matter, a large proportion of which is galena yielding \$90 in silver per ton and 58 per cent. of lead, with one ounce of gold. There is now a very large quantity of ore on the dump.

The Mary Ellen Lode

Is at the north end of the Live Yankee lode, the developments having been mostly done on the latter near the junction of the two lodes.

LETTER-BOXES IN STREET CARS.—A Chicagoan makes what appears to be a sensible and practical suggestion, in advising that a Government letter-box be placed on each street car in the city, in which letters may be deposited at any point along the line, the same being collected by a Postman at the end of the route, and dispatched to the Post Office. With the box so arranged as to receive the letters from the outside of the car, they may be deposited without stopping it for this purpose. The constant stoppages required in taking in and letting out passengers would afford sufficient opportunity for depositing letters.

By this method, letters could be sent to the Post Office from nearly all parts of the city much more frequently than now. It is not intended to supersede the present mode of collecting by the Postman, but only to add so much to the general convenience. By this arrangement, letters intended for city delivery would often reach their destination some hours earlier than by that at present in use. The plan strikes us as being entirely feasible, and there is little doubt that it would be found a great public convenience.

A Mining Marvel.

Our country is fast becoming famous for novelties in mining development, but the seam diggings of Greenwood and Georgetown; the rotten quartz of the Sliger croppings; the golden plates and threads of the Cederberg, and the auriferous porphyry of our own more immediate neighborhood are eclipsed as novelties by the inexplicable development in the Stuckshlager (better known as the Sam Sims) claim, near Uniontown. It has been and is yielding after the manner of "the good old days of '49." In one spot forty ounces was obtained from a single pan of the deposit, gathered up without selection from its native bed. A panful from another spot yielded five and a half pounds (1) of gold. Another panful scraped from the slanting bed-rock last Tuesday yielded over one hundred dollars, and it is a proverb in that vicinity that "Stuckshlager can take out all the gold he wants." The gold is of extra fine quality, has a rusty—sometimes quite black—appearance, and is found in a seam or small ledge of conglomerate material that has baffled the efforts of the sharpest experts to explain or understand. This pay streak of whatever it is crosses the point of a spur that makes out into Granite Creek from the main ridge. The rich seam varies from one and two inches up to a foot in thickness, running nearly parallel with the creek—and towards the main ridge in a westerly direction, we should think. The components of the pay streak are rotten quartz, ferruginous talc, a black substance resembling plumbago, and other indescribable substances, all of which, however, are equally and thickly charged with gold, bright, rusty or black, from the fineness of flour to the scraggy piece worth a dollar or more. On the clay incline which serves for foot-wall to this novel pay streak, and which has a slope of twenty-two to thirty degrees, we inspected a stripped surface of eighteen by forty feet last Tuesday, and there was hardly a space of six inches square upon which a liberal showing of gold was not visible, and in places there was almost as much of the precious metal as of baser substances. Here it was in quartz that clung like a coating of plaster to the bed-rock; in another place it flecked the soft plumbago-like stuff that we would dig out of the soft bed-rock. Everywhere and in all sorts of substances there was gold, gold, gold! The discovery of this deposit, like many other of the best mining discoveries in California, was partly accidental and quite interesting. Stuckshlager and others had worked in the bed and banks of Granite Creek, generally making good pay, until they reached a small ravine that makes down from the upper side of the spur above described. Above that in the creek there was little if any gold. But little by little the persevering Stuckshlager crept up the steep point, finding a patch of pay dirt here and another there, until the brow of the spur was reached and the wealth-bearing seam, the source of all his previous small findings, was struck. Now his process is to pick down and wash off in a sort of ground sluice the overhanging slate, thus laying bare the shallow but rich pay streak, sluicing down both sides of the point and obtaining rich pay in both directions. Discoveries that are believed to be extensions of this deposit, having every appearance of being rich, have been made in the main ridge to the north and across the ravine to the south, in both cases several hundred feet—that to the north being from a quarter to a half mile—from the present scene of Stuckshlager's operations. Those who are curious in such matters can, by calling at this office, have an opportunity to examine some of the specimens which we picked up at a recent visit, and which will give an idea of the peculiar substances in which these rich gold deposits are being found.—Placerville Democrat.

WOODEN RAILROADS.—Several of these, in operation near Quebec, have an aggregate length of one hundred miles. They have a gauge of four feet eight and one-half inches; the running time is sixteen miles an hour, but trains have run at double that speed. The rails are made of maple strips, four by seven inches in cross dimensions. They are set up edgewise, are notched into the cross ties four inches deep, and are held by two wedges driven into the notch, on the outside of the rail. The ties, eight inches thick, are laid twenty inches apart. The roads cost from \$4,000 to \$7,000 a mile, and the rails will last from two to four years, according to the quality of the timber and the amount of the traffic.

SUTTER CANAL AND MINING COMPANY.—Various claims against the estate of the Sutter Canal and Mining Company, in bankruptcy, as well as other matters, having been investigated by Register Clarke, the testimony has been finally submitted to Judge Hoffman, of the United States District Court, and a distribution of the proceeds of the property ordered. There are twelve claims on mortgages and liens and the order in which they are to be paid is set forth in the decision. The matter has now been referred to Register Clarke for liquidation.

IRON ORE IN 1872.—From the Lake Superior mines, the shipments of iron ore for the season of 1872 exceeded the shipments for 1871 by 138,176 tons, and the product of pig iron, without allowing for any made by the Grace furnace, which went into the blast, near the end of the year, is 11,970 tons in excess of 1871.

MECHANICAL PROGRESS.

New Use for the Steam Jet.

Mr. C. W. Siemens, F. R. S., who ranks among the foremost English electricians and mechanical engineers, has lately shown that the steam-jet hitherto used only to quicken the fire in a steam engine, is capable of improvement, and applicable to many useful purposes. The efficiency of the jet depends upon peculiarities in the construction of a tube which cannot be popularly described in a few words; suffice it, that the steam rushes forth as a ring enveloping a core of air, and this, with steam of only three atmospheres effective pressure, will exhaust air as thoroughly as an air-pump. The jet occupies but little space, and is moderate in cost, and therefore can be used in many places where an air-pump would be too bulky or too expensive. The Pneumatic Dispatch Tube, by which dispatches are sent underground from the city to Charing Cross, is, in the whole of its circuit, nearly four miles long. The engine and air-pump by which the tube was worked cost three thousand pounds; three of the steam-jets now do the same work, and maintain so good a vacuum that the "carriers" in which the dispatches are inclosed travel at the rate of nearly fifteen miles an hour.

By adapting the jet to a double chamber and exhausting the air, Mr. Siemens shows that water can be raised as readily as by pumping. The chambers are so constructed that as one empties the other fills, and so the flow of water is continuous. The contrivances made use of for economizing power and multiplying effect are singularly ingenious; and to prevent the noise that would be occasioned by the combined jet of steam and air rushing from the open top of the delivery funnel of the exhauster a "sound-killer" is placed on the top. This sound-killer is a cylindrical metal vessel, containing a series of perforated wooden diaphragms, and has the effect of deadening noise.

In any case where exhaustion is required, the jet may be employed with advantage, and already the manufacturers of sugar see that it will render them profitable service in evaporating cane-juice from the vacuum-pans. There can be no doubt that it will be largely made use of in the West Indies, where its simplicity will recommend it to a population unaccustomed to complicated machinery. It will also be used for separating the molasses from the sugar; and thus supersede the present expensive and troublesome process.

Another application of the jet is in the production of gas for heating purposes; the blast is admitted under the fire-place, and with such economy, that coal-dust of the most inferior quality can be used, while, all other things being equal, the production of gas is doubled, and its quality improved.—*Ex.*

Improvement in British Artillery.

The English are making extensive changes in their artillery material, having decided so to do from the results of various recent experiments. Among the novelties to be introduced into the service are the small Gabling guns of three cwt., with musket proof shields, the guns to be drawn by two horses. This gun is found to be a most effective weapon in defending villages, field intrenchments, for covering the approach to bridges, for defending a breach, and for employment in advanced trenches and fieldworks where economy of space is important. For naval purposes these machine guns are well adapted for use in the tops of vessels of war, for boat operations, service up close rivers, etc.

Experimental proofs of the special value of compressed gun cotton for demolishing stockades, bridges, etc., have also been obtained.

"Picric powder" is not unlikely to be used in the future. It is found to be remarkable for its safety as compared with other explosives.

Improved wads have also been suggested to prevent erosion in the bore of rifled guns. It is also reported that Mr. Scott Russell has in hand a gun on an entirely new principle with which he expects to astonish the world.

NEW PROCESS OF WOOD-ENGRAVING.—A new process of wood-engraving is called the "planotype." The design to be engraved is transferred to a block of lime-tree wood, which is then placed in a machine having somewhat the appearance of a carving-machine, the shape of which varies considerably according to the nature of the work, the graver being kept red hot by a gas-jet. By means of this appliance the design is gradually burnt into the wood. Figures or letters of reference are impressed by means of punches. The whole design having been burnt into the wood, a cast in type metal is taken direct from the block; and without any further preparation the cast may be used for printing from, like an ordinary stereotype plate. It is said that the wood does not suffer in the slightest degree from the heat of the molten metal, and that the finest details are faithfully reproduced. The process is carried out on a large scale, and is found to give most satisfactory results.

Origin and Progress of Hot Blast Furnaces.

From the earliest times, as among the native smiths of Africa to-day, the blast of a bellows has been used in working iron to increase the heat of the combustion by a more plentiful supply of oxygen. The blast furnace is supposed to have been first used in Belgium, and to have been introduced into England in 1558. Next came the use of bituminous coal, urged with a blast of cold air. But it was not until 1829 that Neilson, an Englishman, conceived the idea of heating the air of the blast, and carried it out at the Muirkirk furnaces. In that year he obtained a patent for his process, and found that he could from the same quantity of fuel make three times as much iron. His patent made him very rich; in one single case of infringement he received a check for £150,000. In his method, however, he used an extra fire for heating the air of his blast. In 1837 the idea of heating the air for the blast by the gases generated in the process was first practically introduced by M. Faber Dufour, at Wesseralingen, in the kingdom of Wurtemberg.

In this country, charcoal was at first used universally for smelting, anthracite coal being considered unfit for the purpose. In 1820 an unsuccessful attempt to use it was made at Mauch Chunk. In 1823, Frederick W. Geisenhainer, of Schuylkill, obtained a patent for the use of the hot blast with anthracite, and in 1835 produced the first iron made with this process. In 1841, C. E. Detmold adapted the consumption of gases produced by the smelting to the use of anthracite; and since then it has become quite general, and has caused an almost incalculable saving to the community in the price of iron.

THE INFLUENCE OF THE HOT BLAST.—Professor Akerman, of the Polytechnic Institution of Stockholm, and Professor Tunner, of the Mining school of Leoben, in Austria, have published their views on the influence of the hot blast in the furnace. Akerman contends that the great increase of temperature, and consequent economy of fuel, is chiefly attributable to the circumstance that the heat, which is carried by the blast into the furnace, as compared with that created by the combustion of the fuel, is introduced therein without increasing the volume of gases, as a greater bulk of expanded gases escaping at the furnace top will naturally carry a greater amount of heat with it. Seeing, however, that a hot blast of only 350° to 450° Fahr. will cause an economy of 25 percent. of fuel against a cold blast. Tunner asserts that beside the actual quantity of heat which the blast carries with it, its favorable influence must be looked for in the fact that it facilitates a rapid and complete combustion of the fuel, forming carbonic acid only, which again is not so easily to be reduced into carbonic oxide as Akerman and Bell seem to take for granted. While Akerman is of opinion that for producing white forge pig the temperature of the blast should not be raised over about 500° Fahr., it is claimed that in Styria white and mottled pig iron are constantly produced with hot blast of over 900° Fahr., when the burden is only fluxed with somewhat more lime, the pressure of the blast diminished and the crucible widened to some extent.

THE BESSEMER STATIONARY SHIP SALOON seems to have encountered an unexpected rival in a floating cabin devised by M. Alexandrovski, the inventor of the "under-water" vessel. The construction is very much the same as that of the Bessemer, but the cabin, instead of being attached to a pivot, literally floats in a kind of tank placed amidships between the engines. The invention has been tested by the Grand Duke Constantine in his capacity as head of the naval department, with a perfectly satisfactory result; all efforts to shake the cabin proving utterly unsuccessful, and the pitching, as well as the rolling motion of the vessel being completely counteracted. M. Alexandrovski has gone to England in order to patent his invention, intending to visit France also with the same object. It is expected that he will prove a formidable rival to Bessemer in this direction.

THE PNEUMATIC TUBE TO BE TESTED.—Congress, at its last session, appropriated \$15,000 as a fund for testing the practicability of the pneumatic tube for transmitting small packages. The experimental tube is to be put into operation between the Capitol at Washington and the Government printing office. Mr. Albert Brisbane, the inventor, claims that he can transmit packages from New York to San Francisco by this method. The inside diameter of the tube laid at Washington is thirty-one inches, and that of the sphere, which is to be propelled through it by atmospheric pressure, is thirty inches.

AMERICAN SHIPBUILDING.—The passage in the President's message, relating to the rise of the price of labor in Europe, and the consequent probability of a revival of American shipbuilding, seems to have been well-founded in fact; for the proprietors of a Chester, (Pa.) yard have actually underbitten the shipbuilders of the Clyde in a proposal of the Anglo-American steamship company to construct four iron steamers for them. There is good reason for believing that the offer of the Chester company will be accepted, and, if so, a powerful impetus will be given to the American maritime interest.

SCIENTIFIC PROGRESS.

Contortion of Rocks.

The phenomenon of a layer of limestone, slate, coal or other rock, bent even to a right angle, without utter fracture, is one which a sudden force could not produce, if the mass were solid; and the hypothesis that in such cases the strata were soft and plastic at the time of contortion, does not explain the circumstances, and is for some kinds of rock *a priori* difficult or impossible to admit. When it is once assumed, however, that the forces lifting and binding rocks, were and are mostly very slow and gradual in their action, the difficulty vanishes; for it is now demonstrable that solid and crystalline rocks can be permanently changed in form by such pressure.

Sir James Hall, by an experiment now familiar to geological students, showed upon a pile of cloth, representing a series of sedimentary rocks, the effect of horizontal, lateral pressure in causing curves and folds; but Mr. L. C. Miall, Orator to the Leeds Philosophical Society, has recently applied a similar apparatus to the actual flexure of thin layers of stone, and has found that they can, not only be bent within the limits of elasticity, but permanently "set" without fracture.

It is mentioned as a curious fact that a certain kind of stone found in Missouri, when subjected to heavy pressure, shows quite a degree of elasticity, so that it will contract or expand as the pressure is applied or removed. The statement does not tell us whether this experiment was tried with the stone set up on its edge, or whether it was placed with its plane horizontally as it came from the quarry. But the same fact has been noticed before, indeed, for ought we know forever. Certain qualities of stone, the sandstone, slate and soapstone, in which the body particles are atomized, are peculiarly sensitive to contraction and expansion, from pressure and other agencies, but, not to anything like the extent in a vertical as in a horizontal direction, when they are subjected to test in the same relative position which they occupied in their natural bed. Even granite and trap, and conglomerates generally, are to some extent of the same nature. This should be borne in mind, and when stone is used for construction, especially when put into important buildings or strong abutments, it should be laid just as it lay in the earth, and thus obviate the greatest tendency toward fracture or displacement by the inequalities following the contraction of one more than another, or the expansion or contraction of the whole mass.—*Ex.*

DETERMINATION OF MERCURY IN ITS ORES.—A. Eschka, in a recent German scientific paper, which we have before alluded to in the Press, gives the following method for the determination of the amount of mercury in any given ore: The pulverized ore, after weighing, is placed in a porcelain crucible, the edge of which has been ground. It is there mixed with about half its weight of pure iron filings, and the whole covered with a layer of the latter 0.5 to 1 cm. high. The crucible is then covered with a weighed concave lid of gold having an even edge, and the depression in the cover is filled with distilled water. The crucible is then heated for ten minutes in a flame which surrounds the lower portion of the crucible. At the end of this period which suffices to volatilize all the mercury, the gold lid which has amalgamated with the mercury is taken off, the water poured out, and the mirror of mercury on the convex side washed out with alcohol, dried on a water bath, and after cooling weighed. The increase in the weight of the gold cover corresponds to the amount of mercury in the ore. The author then proceeds to give details as to the precaution to be taken in the manipulation of this process.

ASTRONOMICAL PRIZE AWARD.—At the late meeting of the French Academy of Science, the Astronomical prize was awarded to Mr. Huggins, in consideration of some very important discoveries made by him through the aid of the spectroscopic, with regard to the composition of planets, stars, nebulae and comets. He has clearly shown that the constituents of all the celestial bodies are the same or similar to those of the earth. He has also shown that while the light emitted by the nucleus of comets is inherent in itself, that exhibited by the nebulous surrounding atmosphere and "tail" is merely reflected sunlight. A uniformity in chemical composition is thereby shown to exist throughout all the bodies of space.

SCIENTIFIC PRIZE AWARDS.—The French Academy of Sciences has awarded its prize in botany for 1872, to Professor Notaris, director of the Botanical Gardens of Genoa, for his remarkable studies on mosses. M. Duqueane, a French druggist, was also rewarded for his useful researches on the active principle of aconite. In zoology, M. Schotte, a professor at the University of Copenhagen, received a prize for his studies on the metamorphoses of coleoptera, etc., etc.

How far Can We See.

Herschell was of the opinion that, with the telescope he used in those researches in the heavens which immortalized his name in the annals of Science, he could penetrate 497 times farther than Sirius, assumed to be at least so far distant that the sun is near at hand in comparison. While exploring with that instrument, 116,000 stars dotted by the object glass in one quarter of an hour, and that subtended an angle of only 15°. So all the worlds are moving rapidly in space. Reckoning from the limited zone thus inspected, the whole celestial region could be examined by giving time enough to the enterprise; and judging from a few sections within the scope of assisted vision, more than five billions of fixed stars might be reasonably supposed to be recognizable, and could be seen with modern improved instruments. But more are beyond, vastly beyond, and we are hoping and expecting that, when Mr. Clark, the self-made astronomer of Cambridge, Mass., and the most progressive telescope manufacturer now known to scientists, has completed his great work, far more amazing discoveries will be made in the firmament. Surely, the mechanism of the heavens demonstrates the existence of an Intelligent First Cause, since such magnificent displays of unnumbered worlds, regulated by laws which secure order in the universe, could not have originated themselves. God surely reigns and directs.—*Scientific American.*

THE ANCIENT "ATLANTIS"—WHAT IT INCLUDES.—It is well known to readers of history that no less a person than Plato sent down to posterity a tradition of his day, that a great continent which occupied the place or area now covered by the Atlantic ocean, suddenly sank out of sight, into the unknown depths. He further says that it was an island called Atlantis; on it were kingdoms and organized governments, wealth, arts and civilization—all instantly lost to sight. It is now the opinion of some of the most learned geologists, who have given attention to this special subject, that the American continent appeared when the Atlantic waters rushed into the enormous cavity or depression on the earth's surface now filled by salt water. The Rocky Mountains, according to this theory, were then the rough bottom of an ocean, which rose with marine plants, shells, and other objects of an aquatic origin, that are abundantly strewn there, and in fact all over North and South America. Remnants of Atlantis, the submerged continent, are believed by some scientists, who have made the matter one of particular geological investigation, to be recognized in the Adirondacks, also in the mountain ranges in some parts of Maine.

THE OXY-HYDROGEN LIGHT.—Exhaustive experiments have recently been made in Paris to test the utility of the oxy-hydrogen light, and Mr. M. P. Thomas, acting under instructions from the Paris Society of Civil Engineers, has recently presented to that body a report upon the light. The conclusions arrived at are the following: (1) Theoretically, the combustion of oxygen does not increase the illuminating power of a given volume of gas. (2) Practically, however, it enables a burner to consume four times the quantity of gas that can be burned in air, without detriment to the utilization of the light which may be developed. In particular, it utilizes the entire luminous capacity of the gases, however rich, and in almost any quantity. Consequently, it would be disadvantageous to employ it for ordinary street-lighting, on account of the limited quantity of gas consumed by the burners, the only advantage being the beauty of the light provided the gas is very rich. But it is very disadvantageous for great centres of light (sunburners, etc.), where a large volume of gas is to be consumed without loss.

SCIENTIFIC EXPERIMENTS WITH IRON.—M. Caron has succeeded in putting iron into the condition called "burnt," by heating it in the open fire, in nitrogen gas, and in hydrogen gas; whence he concludes that this condition is not due to the absorption of any special gas, but to a modification in its molecular condition, caused by the heat. Caron also tested samples of iron at temperatures from 0 deg. to 18 deg., and concludes that iron does not become brittle by cold. He says, "Whenever, by a strain, a bar of iron breaks with a crystalline fracture, it is certain that this structure pre-existed; it may have originated in poor workmanship, but is not due either to the long use, nor to the cold which it has undergone."

NEW MIXTURE FOR CRUCIBLES.—A crucible for steel and the noble metals can be made from a mixture of broken porcelain ten parts, graphite ten parts, fine asbestos, three millimeters long, fifteen parts, not too finely pulverized quartz three parts, fire clay twenty-two parts. It is claimed that the asbestos prevents cracking and breaking, and thus provides against loss.

AIR WAS COMPRESSED by Professor Tyndall, by means of a column of water 260 feet high, to one-eighth of its original volume, (120 lbs. to the square inch) and then allowed to escape. As it rushed out, it expanded so violently and caused such an intense cold that the moisture in the room was congealed into a shower of snow, while the pipe from which the air issued became bearded with icicles.

[COLLATED WEEKLY FROM ALL NOTICES ADVERTISED IN S. F. JOURNALS.]

ASSESSMENTS.							
Name of Co.	Location.	Secretary.	S.F. Office.	Assem't.	Levied.	Delinq't.	Sale.
Adams Hill Ore. M. Co.	Eureka Dist.	W. W. Taylor.	414 California St.	25	Dec. 27	Jan. 24	Feb. 1
ADMIRAL NELSON T. & M. CO.	Ore. Co. Utah.	R. H. Simon. Room 10	141 Montgomery St.	10	Jan. 27	Mar. 8	Mar. 31
AMANO M. M. CO.	Ely District.	W. J. MacLennan.	609 1/2 Cal.	10	Jan. 27	Feb. 23	Feb. 14
Amelia S. M. Co.	Ely District.	L. Kaplan.	Merchants' Ex.	10	Jan. 27	Mar. 8	Mar. 2
Anthony G. M. Co.	Placer Co., Cal.	W. I. Kip Jr.	41 1/2 Cal. St.	25	Jan. 29	Mar. 4	Mar. 2
Arkansas M. Co.	Ely District.	J. H. Applegate.	729 Montgomery St.	50	Jan. 18	Feb. 26	Mar. 2
Arthur G. M. Co.	Cal. Co.	R. M. Scherer.	414 California St.	10	Jan. 18	Mar. 13	Apr. 2
Buckley & C. M. Co.	Washoe.	J. Maguire.	419 California St.	100	Jan. 21	Feb. 25	Mar. 2
Caaveras G. M. Co.	Cal.	T. B. Wingard.	318 California St.	25	Feb. 15	Mar. 18	Apr. 2
Caedonia S. M. Co.	Washoe.	R. Vegenier.	414 California St.	200	Feb. 15	Mar. 12	Apr. 2
Cedberg & P. J. St. John Ex. Co.	Cal.	506 Montgomery St.	506 Montgomery St.	10	Jan. 27	Mar. 17	Mar. 17
Cedberg First South Ex. M. Co.	Cal.	J. N. Webber.	506 Montgomery St.	5	Oct. 27	Feb. 23	Mar. 17
Cherokee Flat Blue Gravel M. Co.	Cal.	H. Pichoir.	43 Washington St.	100	Feb. 4	Mar. 10	Mar. 2
Chieft of the Hill M. Co.	Ely District.	S. S. Neal.	402 Montgomery Street.	100	Jan. 15	Feb. 20	Mar. 2
Constance M. M. Co.	White Pine.	R. M. Scherer.	392 Montgomery St.	25	Jan. 15	Mar. 15	Mar. 15
Diney G. & S. M. Co.	Nevada.	G. K. Spinney.	330 Cal. St.	25	Jan. 24	Mar. 2	Mar. 2
Dunham M. Co.	Buile Ore., Cal.	G. F. Halcom.	428 Montgomery St.	40	Jan. 8	Feb. 17	Mar. 2
EMERSON M. CO.	Santa Barbara Co.	Wm. H. Watson.	502 Montgomery St.	100	Jan. 18	Mar. 19	Mar. 24
Empire M. Co.	Idaho.	G. K. Spinney.	320 California St.	50	Jan. 8	Feb. 11	Mar. 2
Equivalent T. & M. Co.	Utah.	O. S. Healy.	Merchants' Exchange.	100	Jan. 22	Feb. 22	Mar. 1
Washoe M. M. Co.	Idaho.	Wm. E. Dean.	419 California St.	100	Jan. 7	Feb. 10	Mar. 2
Golden Chariot M. Co.	Idaho.	L. Kaplan.	Merchants' Exchange.	25	Jan. 20	Feb. 26	Mar. 2
GOLD RUN M. CO.	Nevada Co., Cal.	G. C. Palmer.	Market and Spear S. S.	10	Dec. 30	Feb. 4	Feb. 25
Graham & Curry S. M. Co.	Washoe.	A. K. Durbrow.	Merchants' Ex.	60	Jan. 17	Mar. 17	Apr. 1
Gravel Tunnel M. Co.	Cal. Co. Nevada.	W. J. MacLennan.	414 California St.	6	Jan. 17	Feb. 24	Mar. 2
Harver S. M. Co.	Ely District.	J. R. Wilde.	306 Montgomery St.	10	Jan. 29	Mar. 17	Mar. 17
Hayes G. & S. M. Co.	Nevada.	H. O. Howard.	323 Montgomery St.	100	Feb. 5	Mar. 18	Apr. 1
Hope Gravel M. Co.	Grass Valley.	L. Kaplan.	Merchants' Exchange.	50	Jan. 17	Mar. 20	Mar. 1
Idaho M. Co.	Idaho.	W. E. Dean.	419 California St.	100	Jan. 23	Feb. 24	Mar. 2
Imperial S. M. Co.	Washoe.	W. E. Dean.	419 California St.	100	Jan. 23	Feb. 27	Mar. 2
Jackman M. Co.	Eureka District.	H. C. Kibbe.	419 Cal. St.	10	Jun. 24	Feb. 26	Mar. 2
Juanita Ore. M. Co.	Esmeralda Co., Nev.	O. S. Neal.	402 Montgomery St.	65	Jan. 17	Feb. 24	Mar. 1
Kambeck M. Co.	Ely District.	J. Maguire.	415 Montgomery St.	50	Feb. 8	Mar. 15	Apr. 1
Kentucky G. & S. M. Co.	Ely District.	J. P. Cavallier.	509 Cal. St.	10	Jan. 11	Mar. 15	Apr. 1
Lady E. Ten T. & M. Co.	Utah.	O. S. Healy.	Merchants' Ex.	5	Jan. 13	Feb. 13	Mar. 2
Leix M. Co.	Ely District.	B. B. Minor.	41 1/2 California St.	10	Jan. 20	Feb. 28	Mar. 2
LEWIS M. M. & M. Co.	Cal.	505 Humboldt St.	505 Humboldt St.	10	Jan. 17	Mar. 18	Apr. 8
Lillian Hall M. Co.	Ely District.	T. D. Bagley.	419 Cal. St.	25	Jan. 23	Feb. 27	Mar. 2
McMahon M. Co.	Schler Ore.	G. K. Spinney.	320 California St.	25	Jan. 9	Feb. 13	Mar. 1
Mead W. Valley East Ex. M. Co.	Cal.	W. W. Connors.	419 California St.	10	Jan. 15	Feb. 25	Mar. 2
Mead M. M. Co.	Idaho.	T. E. Jewell.	507 Montgomery St.	10	Jan. 20	Feb. 20	Mar. 2
MOHAYE CON. G. & S. M. CO.	Ara.	T. E. Jewell.	507 Montgomery St.	10	Jan. 15	Feb. 13	Mar. 2
MIT JEFFERSON M. & M. CO.	Cal.	J. W. Clark.	418 California St.	15	Dec. 18	Jan. 27	Feb. 17
National M. Co.	Nye Co., Nev.	B. B. Minor.	41 1/2 California St.	50	Dec. 27	Jan. 31	Mar. 2
Nevada M. M. Co.	Ely District.	J. Maguire.	419 California St.	50	Jan. 27	Mar. 7	Mar. 7
Newton Booth Con. M. Co.	Ely District.	J. F. Stirling.	314 California St.	25	Dec. 10	Mar. 22	Apr. 1
Newt n Booth on M. Co.	Ely Dist.	O. S. Lamb.	314 California St.	25	Dec. 30	Feb. 1	Feb. 2
NOODNAY S. N. Co. White Pine Dist.	Idaho.	Joseph Masuire.	419 California St.	10	Jan. 14	Feb. 22	Mar. 17
Occidental M. S. M. Co.	Nevada.	C. S. Elliott.	419 California St.	65	Jan. 25	Feb. 25	Mar. 2
Occidental M. Co.	Storey's Nev.	C. S. Elliott.	419 California St.	75	Feb. 8	Mar. 17	Apr. 1
OHIO CON. G. & M. CO.	California.	W. A. Knapp.	432 Montgomery St.	10	Feb. 11	Mar. 15	Apr. 5
Oil Providence M. & M. Co.	California.	F. Swift.	415 Montgomery St.	10	Jan. 27	Feb. 12	Mar. 2
Ore. M. Co.	Washoe.	Merchants' Exchange.	Merchants' Exchange.	30	Dec. 10	Feb. 13	Mar. 2
OPHIR C. S. & G. M. CO.	Placer Co.	O. H. Pogart.	402 Montgomery St.	10	Dec. 10	Jan. 25	Feb. 17
Pacific Roax Co.	Esmeralda Nev.	O. Leuba.	507 Montgomery St.	25	Dec. 31	Jan. 30	Feb. 1
Page & Panaca S. M. Co.	Ely Dist.	L. Kaplan.	Merchants' Exchange.	60	Feb. 3	Mar. 11	Apr. 1
Pavine G. M. Co.	Ely District.	J. D. MacLennan.	419 California St.	60	Jan. 27	Mar. 28	Apr. 1
Phoenix S. M. Co.	Eureka District.	J. Maguire.	419 California St.	60	Jan. 7	Feb. 13	Mar. 1
PIERMONT M. & M. CO.	Oal.	J. W. Clark.	418 California St.	50	Jan. 25	Mar. 10	Mar. 31
Pioche Phoenix M. Co.	Ely District.	O. S. Elliott.	419 California St.	100	Feb. 1	Mar. 11	Apr. 1
Pioche West Ex. M. Co.	Ely District.	T. M. Gorman.	419 California St.	100	Jan. 27	Mar. 27	Apr. 1
Poreouts G. M. Co.	El Dorado Co.	D. A. Jennings.	401 California St.	50	Jan. 31	Mar. 7	Mar. 7
RAILROAD CON. M. CO.	Nevada.	Jos. P. Nourse.	328 Montgomery St.	15	Jan. 7	Feb. 13	Mar. 20
Rio's s ar	Idaho.	Wm. Willis.	412 California St.	10	Jan. 9	Feb. 15	Mar. 1
RIKERS-ONG M. Co.	Eureka Dist.	Wm. W. Burlington.	419 California St.	15	Jan. 15	Feb. 18	Mar. 2
San Jose Con. M. Co.	Ely District.	J. H. Applegate.	729 Montgomery St.	10	Feb. 6	Mar. 17	Apr. 1
Savage M. Co.	Washoe.	O. B. James.	401 California St.	100	Jan. 6	Feb. 10	Mar. 2
Santa Rosa Coal M. Co.	Cal.	W. A. Knapp.	525 Kearny St.	50	Feb. 15	Mar. 15	Apr. 1
S. ORIPSON S. M. CO.	Nevada.	Wm. H. Martin.	525 Kearny St.	50	Feb. 6	Mar. 12	Mar. 25
Sona or S. M. Co.	Washoe.	H. Boyle.	Stevensons' Build'g.	50	Feb. 11	Mar. 8	Mar. 2
Setting Sun G. M. Co.	Ely District.	Honry Boyle.	Stevensons' Build'g.	30	Jan. 29	Feb. 11	Mar. 2
Silver Hill & C. Co.	Idaho.	J. W. Dean.	418 California St.	20	Jan. 28	Mar. 14	Mar. 14
SILVER WAVE M. CO.	Nevada.	J. W. Clark.	418 California St.	60	Jan. 24	Mar. 14	Apr. 8
Spring Chariot M. Co.	Idaho.	J. L. King.	411 California St.	50	Nov. 27	Jan. 6	Jan. 2
SPRING MOUNT M. Co.	Nevada.	T. W. Gorman.	419 California St.	25	Jan. 15	Feb. 25	Mar. 2
SPRING MOUNT M. CO.	Nevada.	T. W. Gorman.	419 California St.	25	Jan. 15	Feb. 25	Mar. 2
STANFORDS M. CO.	Nevada.	Chas. H. Fish.	419 California St.	10	Jan. 3	Feb. 8	Mar. 3
STATE OF MAINE M. & M. CO.	Oal	H. B. Congdon.	306 Montgomery St.	5	Jan. 23	Feb. 24	Mar. 17
Starr King S. M. Co.	Elko, Nev.	L. Kaplan.	Merchants' Ex.	50	Dec. 26	Jan. 31	Mar. 2
State of Nevada M. Co.	Amador Co.	Wm. W. Connors.	734 Montgomery St.	10	Jan. 14	Mar. 14	Mar. 14
Table Mountain Blue G. & M. Co., Cal.	Cal.	W. L. Ueck.	435 California St.	25	Jan. 30	Mar. 4	Mar. 4
TABLE MOUNTAIN ALPHA M. Co.	Cal.	W. L. Ueck.	438 California St.	5	Feb. 3	Mar. 10	Mar. 10
Temenie S. M. Co.	Ely District.	S. Phillips.	415 Montgomery St.	10	Feb. 3	Mar. 10	Mar. 10
Tenney S. M. Co.	Idaho.	J. H. Applegate.	729 Montgomery St.	10	Feb. 3	Mar. 10	Mar. 10
Tone Mountain M. Co.	California.	D. F. Verdolan.	635 Clay St.	10	Jan. 2	Feb. 1	Feb. 1
Union Gravel M. Co.	Cal.	T. Derby.	328 Sanso o St.	150	Dec. 7	Jan. 25	Feb. 1
Washington & Crede M. Co.	Ely Dist.	E. D. Cleary.	419 California St.	50	Jan. 22	Mar. 6	Mar. 6
Washoe & Nye M. Co.	Cal.	H. B. Congdon.	305 Montgomery St.	10	Jan. 24	Mar. 24	Mar. 24
Yellow Jacket M. Co.	Washoe.	G. W. Hopkins.	Gold Hill.	50	Jan. 4	Feb. 4	Mar. 4

[S. F. Stock and Exchange Board.]

THURSDAY EVENING, Feb. 13, 1873

SURRO TUNNEL.—In shaft No. 4, a diamond drill has been started. Eight holes will be drilled in the shaft 50 feet deep; when the drill is removed the holes will

MINING SUMMARY.

California

out and crushed, and when that fact is considered but few mines show a better quality of ore. The ore is also rich in sulphurets that assay as high as \$225 per ton. The battery is to

that new and extensive hoisting works are to be erected in the spring, the old works being insufficient to cope with the increased body of water.

EL DORADO.

several dollars in silver mixed with a trace of copper. This ledge is said to be as wide as the renowned Big Blue of Kernville. There is said to be enough ore in sight to drive a 20 stamp mill a year. The size of the ledge being so

with green, its owners have in accordance with

these evidences of its character named it the Green Gold Monster.

SALE.—Feb. 1: Mr. J. J. Murphy, our leading merchant, has just purchased of Mr. Hugh McKendancy a one half interest of all the mines belonging to that gentleman. The purchase is an extensive one; conveying some seven or eight mines, prominent among which are the Delphi and Connets of Tyrol. The price paid for these valuable mines is only \$20,000.

NEVADA COUNTY.

FRENCH COBAL.—Cor. Marysville Appeal, Feb. 8: The famous mines near this town are being worked. This quaint old town has taken a new lease of life and is fast resuming the activity and bustling energy of the long ago. Miners are busy, water is being brought in, claims are being opened and some are worked, giving employment at good wages to all who seek a living by labor.

PROVINCIA.—Nevada Transcript, Feb. 11: This mine on Deer Creek, which has been for some time past worked by enterprising gentlemen who took hold of it under most discouraging circumstances, is looking and paying first rate. The ledge is 8 ft. thick, and the rock is richly studded with sulphurets. The returns are most encouraging, and the mine as a paying institution will soon take rank among the first mines of the county.

Feb. 12: The vast body of "hill diggings" near this place were worked in 1854 by G. W. Gloister. The ravine leading to the channel, and down which the tailings from the claims are poured, was worked in 1850 and paid immensely. About \$3,000,000 was taken from this little stream, and in following it to the hill the "pitch" of the bed rock gave evidence of the channel beyond. About the time others opened claims on the north side of the present town. The gold in the claims, as well as that found in the ravine, was fine, the largest pieces rarely being worth more than fifty cents. The Milton Mining & Ditch Co's ditch has been enlarged to a carrying capacity of 5,000 inches. This Company has made arrangements by which they will be supplied with water the year round until their new ditch shall have been completed; when completed, it will furnish 10,000 additional inches. The first tunnel was operated in 1860, the cost of its construction being \$10,000.

PLACER COUNTY.

THE SALSIO.—Placer Herald, Feb. 8: This mine, which paid so flatteringly for the first 100 ft., is again at 150 ft. deep showing a fine, rich ledge. From about 110 to 140 ft. the ledge seemed broken and badly defined, but when the shaft reached near 150 ft. it came into the shaft, the same old golden, familiar, fat rock, finely defined, and promising to hold out for any depth.

The new rich strike, spoken of last week, was made near Temperance Flat, 3 miles northwest of here, in the Lone Star District. The ledge is 2 ft. thick, and many extensions have been taken up.

GREAT BLUE GRAVEL.—The Superintendent of this mine, has sent us a box of specimens of the washed rock, gravel and cement from this mine, located near Todd's Valley, taken from a point 230 ft. below the hoisting works and 350 ft. deep from the surface, and evidently from near the bottom of the channel. These specimens carry mineral and show beyond cavil that they came from an old river channel.

RISING SUN.—Placer Argus, Feb. 8: We were on Tuesday last, shown some rock taken from the mine at Colfax, which was literally interspersed with gold. It has been worked continuously for about 6 years, the main shaft is down 400 ft. and they have drifted about 400 ft. on the ledge. All of the rock taken from the ledge has been worked and yielded on an average \$28 per ton. The specimens shown us were taken out between the 300 and 400 ft. levels and some of them were found over 200 ft. apart. The company have a 5-stamp mill in operation. They cleaned up for the month of January over \$1,800.

SAN DIEGO COUNTY.

BANNER DISTRICT.—Cor. San Diego Union, Jan. 30: George V. King has sold his one-fourth interest in the Golden Chariot to his partners, for the sum of \$25,000. The main shaft is now 90 feet deep, showing a better prospect than ever before. Levels will be started at the depth of 125 ft. The ledge in the 50-ft. level is about 3 ft. wide and very rich. The new whim works like a clock and sinking is much easier than was expected. In fact, the prospects of the Company were never as good as at present, with a fine large ledge in sight, and about 400 tons of rich rock on the dumps.

SONOMA COUNTY.

MINING EXCITEMENT.—Cloverdale Bee, Feb. 8: There is some excitement here at present relative to quartz, and men from town have been prospecting in the neighboring hills and ravines the past week or two. Some persons report that they have found good prospects, both of gold and silver. Specimens of the rock have been sent to San Francisco for assay.

TUOLUMNE COUNTY.

SPRING GULCH.—Sonoma Democrat, Feb. 8: The ore crushed at this mine, during the month of January, yielded \$2,300 over and above expenses for the month. The ore worked, came out where the vein is 22 ft. in width and 140 ft. below the surface.

MASTON.—Sonoma Independent, Feb. 8: We were shown this week by the Smith Brothers, a \$500 chunk of gold from the crucible; the product of about 30 tons of rock. At least 15 tons of the rock crushed was far below the average grade. Their shaft is 90 ft. and shows a vein 20 ft. wide.

SAN BERNARDINO COUNTY.

HYDRAULIC MINING AT LITTLE CREEK.—San Bernardino Guardian, Feb. 1:—The Lytle Creek panners, first organized in 1862, after being worked by a company for several years, have passed under control of the Messrs. Abadie, who have been very successfully developing them for several years. More than 3 miles of ditch, with convenient bulkheads, flumes, and other appliances, have been constructed. The gravel-gold-bearing alluvium—is subjected to so powerful a force by means of water that banks melt and hills crumble in a manner truly wonderful. As the deposit is almost inexhaustible, these works are likely to constitute for years to come, a prominent feature of mining industry in this part of the State. The gold saved is mostly coarse, in many instances the pieces ranging from \$15 and \$20 to \$40 and \$50 in value, together with a large yield of scale gold. The Abadie claim is some 12 miles from town, and lies near the mouth of the cañon.

LIZZIE BELLOCK.—San Bernardino Argus, Feb. 6: Probably a majority of the people of the State are unaware of the vastness and richness of the mines in our immediate vicinity. Some statistics are here presented: The Lizzie Bellock shipped from Sept. 7 to Nov. 1, 310 sacks of ore, weighing 29,703 lbs., and netting \$14,460.46.

McFARLAN.—Shipped during 1872, 1,116 sacks of ore, weighing 89,219 pounds, and netting \$29,267.66.

HOLCOMBE VALLEY.—This very important mine, distant 40 miles, was recently sold to an English Co. for \$120,000. The new company propose to run a tunnel a distance of 2½ miles after striking the bed rock. The present owners have sent their own assayer from London, who says that they propose to expend \$150,000 in prospecting during the present year.

Nevada.

REESE RIVER.

RICH STRIKE OF COPPER ORE.—Reese River Recorder, Feb. 7: We have been shown a number of specimens of copper ore which are richer in that metal than any we have ever seen; it assays 75 per cent. in copper. These specimens were taken from the "Columbus" mine situated in Bolivar District, 75 miles west of Austin and 35 miles from Oresma Station, on the Central Pacific Railroad; the ledge is reported to be 4 ft. thick and the stratum where these specimens were taken from is 12 inches in thickness, of solid metal.

WASHOE.

LEO.—Gold Hill News, Feb. 8: This is one of the old Gold Canon locations. In 1860 a tunnel was run into the hill a distance of 280 ft. following the ledge, which is about 25 ft. wide, and good pay ore was developed. In the general decline of mining interests the work was suspended. The tunnel is cleaned out and at a favorable point 16 ft. in from the mouth, an incline is being sunk in the ledge which is now down 40 ft. The pay ore, mostly of the gold character, lies in two strata, one on each side of the ledge.

HALE & NORCROSS.—Daily yield, 180 tons of ore, worth \$36 per ton, showing an increase in the daily yield of 30 tons of ore per day. The ore breaks between the 8th and 9th and 10th stations are opening out finely, slaking in the ledge which is now down 40 ft. The pay ore, mostly of the gold character, lies in two strata, one on each side of the ledge.

VIRGINIA CONS.—The shaft is down 661 ft. The sinking is making excellent progress. The main north drift on the 1,167-ft. level of the Gould & Curry shaft is still pushed with all the vigor possible in a direct line, to connect with the shaft, without regard to ledge developments for the present.

LEO.—The main east drift on the 1,500-ft. level has made slow progress during the week, on account of the steady flow of water and the extreme heaviness of the ground. The main south drift on the 1,600-ft. level, to connect with the north drift from the Savage, is making good progress.

KNOX BROOKER.—During the week the main west drift at the 400-ft. level, based through 12 ft. of a clay wall and struck quartz of a good character, but a strong flow of water was also tapped, so that the workmen were obliged to secure the drift as well as possible and go to hoisting water.

CALIFORNIA.—The main north drift at the 400-ft. level of the new shaft has made the connection with the north winze from the level above, giving a good circulation of air and greatly facilitating the work in that part of the mine.

WOODVILLE.—The ledge opens out finely at the lowest level, 320 ft. from the surface. It is being drifted upon from that point, both north and south. The north drift shows a very fine body of rich ore, which widens out as further developed. The south drift also shows splendidly the ledge holding its width. Both drifts are yielding large quantities of high grade ore.

SIERRA NEVADA.—Daily yield 65 tons of ore, keeping the mill steadily running.

ARIZONA AND UTAH.—The water has been drained from the shaft and sinking resumed.

BELCHER.—Daily yield, 370 tons. The mine never looked so well as now at all points, and the lowest, or 1,200-ft. is opening out much better than was expected. The ore is being breasted out at that point 6 sets of timbers in width, and assays run high throughout. The face of the south drift is in porphyry, and quartz with a streak of ore.

CROWN POINT.—Daily yield about 500 tons, a large portion of which is from the 1,300-ft. level. The ore body is opening out at this point better even than was expected by the most sanguine, the ore being of extra fine character.

YELLOW JACKET.—The 1,600-ft. level main drift east is being driven ahead and has, it is estimated, about 50 ft. to go in order to reach the ledge.

SILVER CLOUD.—he slopes and face of the upper and lower drifts are looking and yielding splendidly; 20 tons daily of high grade ore, is being shipped to mills, and the Superintendent estimates that there is fully 200 tons of ore in sight, which can be extracted at very small cost and excellent profit.

BONNY.—This mine is situated in Spring Valley, Devil's Gate District. A shaft has been sunk to the depth of 10 ft. on the ledge, which at that depth shows a fine vein of good ore 2½ ft. in width. A quantity of ore taken from Quinn, an adjoining claim on the same ledge, yielded \$74 per ton.

BALTIMORE CO.—Shaft down 443 ft. with the bottom in very hard blasting rock at present. The drift west at the 250-ft. level is in 301 ft. with the face in porphyry and quartz, some of which gives low assays.

CHOLLAR POTORI.—Daily yield 80 tons, the assay value of which is \$33 per ton, showing a decrease in the daily yield of 40 tons of ore from the week. The prospecting drifts on both the 750 and 950-ft. levels are pushed with all the vigor possible.

ALAMO.—The labor of hoisting by hand from the shaft being too great for the men to endure, preparation is being made to erect machinery with which to do the hoisting.

STUCKER.—The main drift from the shaft in the canon has cut a vein of ore 2½ ft. in width, and the course of the drift was then changed so as to follow and prospect the vein.

JUSTICE.—Work is resumed in this mine, under the most favorable auspices.

GLOBE.—The drift to connect with the shaft is in 43 ft. The raise from the main tunnel is up 60 ft., the face showing some excellent indications of good ore.

OVERMAN.—The pump continues to handle the flow of water with ease, and is gradually draining the supply. The main west drift is still driven ahead.

KENTUCK.—The only operations at present are in the old workings about the 400 and 500-ft. levels, which continue to yield considerable good ore yet.

SAND DESERT.—The main east drift is 3,357 ft. Face in good working ground with no water.

JULIA.—The main east drift at the 800-ft. level is making good progress, with very little water in the face.

ELY DISTRICT.

RAYMOND & ELY.—Pioche Record, Feb. 2: Between 80 and 90 tons of first-class ore are raised daily, and about 30 tons of third-class—the medium or second-class grade being assorted into first and third-classes before shipment to the mill. About 150 tons are being sent to the mills daily, the Co's 2 mills being constantly engaged in reducing, and the Magnet mill a portion of the time. The production of bullion is enormous.

NEWARK.—The ledge cut in the south drift the past week, on its 500-ft. level, is now being worked, and looks favorable. The vein varies from 2 to 8 inches in extent, and the ore assays over \$200, being high grade. Work has been suspended in the main shaft to timber up, but will soon again be resumed. The shaft is now over 600 ft. deep, being next to the deepest in Southwest Nevada.

LOUISE.—There is now considerable rich chloride ore on the dump, which was extracted from a depth of 200 ft.

HURN & HURN.—A large amount of ore has been delivered at the new Florist mill during the week, much of it first-class, and there is no intermission in the hauling, about 28 tons a day being delivered. All this is from the back ledge. Every drift and way stop is of good size and the ore is very rich.

NEW YORK TUNNEL CO.—This is a location recently made under the new Mining Law. The float and top rock from several ledges found assay from \$50 to \$700 per ton. The tunnel site is a few miles west of Pioche, and work has already been commenced. It is the intention to run the tunnel 500 or 600 ft.

UTAH DRIFT.—The ledge cut in the main shaft of a new lode, which was located some time last week. It is not far from town. After prospecting unavailingly for two months last Monday a body of very rich ore was struck. A sample is lying before us, and is apparently very rich.

PORTLAND.—The winze is now down 85 ft., showing a vein 3½ ft. wide of splendid ore, the average assay being \$102.

PI-CHE PHENIX.—The new shaft is down 270 ft. The rock has been very hard the past week, but is again becoming soft. In the old works drifts are being run for ore connections. Satisfactory results so far.

MAZEPPA.—A winze is being sunk on the main vein of ore. From 20 to 30 tons of ore have been raised during the past week. The ledge is looking finely in all its drifts and stopes, and gives renewed promise of soon producing bullion in large quantities.

ALRE.—The dump is full of good ore, and about 7 tons a day are being shipped to the mill. Milling will soon be begun. The main shaft is now 300 ft. in depth, from which point the ledge will be drifted for this week.

SILVER BEAR.—During the week the incline has been sunk about 15 ft. depth. A certificate of assay of two classes of rock from the bottom of the Silver Peak incline gives as follows: "Grey, per ton, \$169.64; light, \$150.77." The vein is about 6 inches in width. Work is progressing on the tunnel below finely.

STANDARD.—The average assay of the ore on the dump is \$192. Two shifts are engaged.

MARION.—Still sinking on the ledge. Shaft down 250 ft. The ledge is very large, and runs very regularly.

WASHINGTON AND IDAHO.—The ledge has been improving lately, beyond doubt. A new contract has just been let to sink the incline 100 ft. deeper.

PROCHE.—During the month of January 155 tons of ore have been shipped from the mine to the Magnet mill; and from this amount well on to \$15,000 worth of bullion have been returned. The ore breaks as is favorable as ever in extent and quality, and the usual amount of ore continues to be hoisted daily.

CHIEF EAST EX.—Sinking the winze below the 90-ft. level; now down 95 ft. The ledge is from 12 to 15 inches wide, and mixed with some fine ore; improves as drifting east continues.

Arizona.

WALLAPAI DISTRICT.—Prescott Miner, Jan. 25: A citizen of Corbat contributes the following to the Los Angeles Express:

Allow me to premise, after 23 years experience on the Pacific Coast, that I have never found a chain of mountains so richly endowed with mineral wealth, as this district—every day new ledges are struck, and the assays are wonderful.

In a short letter it is impossible to speak of the multitude of rich mines, but I must say that as a big thing, the Ida mine is simply tremendous; it is down 25 or 30 ft., and of more than 30 assays made, the ore averaged over \$1,000 per ton. Our only cry is for more mills to work our rich ore; as it is at present, we have to pay one hundred dollars for the purpose of working the ore in San Francisco.

ITEMS.—Nearly \$1,000 in gold dust was brought here this week by placer miners of Lynx and Hassayampa creeks.

No ore is being worked in Bradshaw mountains, but a great deal of ore is being taken out.

A Mexican gentleman writing to the San Diego World, gives glowing accounts of the silver mines on the line between Sonora, Mexico, and our Territory, ore from which has yielded at the rate of \$1,500 per ton. He says that his government is anxious to forego it to go there and work.

Lower California.

SAN RAFAEL COPPER AND SILVER MINING CO.—San Diego Union, Jan. 28: Among the passengers of the "Pacific" which arrived here on Sunday afternoon was Mr. C. F. Robinson of San Rafael. Mr. Robinson is interested in important mining enterprises in the vicinity of San Rafael, Lower California. His recent visit to San Francisco was for the purpose of organizing a company for the development of his mine, which we learn he was successful in doing. The company has been incorporated as the San Rafael Copper and Silver Mining Company, with a capital stock of \$3,000,000, in 30,000 shares of \$100 each. The Trustees are S. A. Raymond, J. A. Albertson and Thomas Rogers. The object of the Company is mining for copper and silver in the San Rafael Mining District, Lower California; to erect mills and smelting works; to purchase and sell mining and other stock and property.

Mr. Robinson has brought with him from San Francisco all the necessary tools for mining, hoisting machinery, and ample supplies of provisions for those employed in the Co's service. The ledge upon which the operations are going to be commenced is situated 20 miles from San Rafael. It is well defined, and about 6½ ft. in width. The vein matter assays from 40 to 41 per cent. copper, and native party ore—and contains a small percentage of silver besides.

Montana.

LEGAL TENDER.—Helena Herald, Jan. 28: On last Sabbath afternoon, at the depth of 16 ft. they unexpectedly came upon a vein of solid ore 10 inches in width, and the average assay is \$2,800 in silver per ton of 2,000 pounds, of which the poorest of the vein went \$2,100 and fancy samples, \$17,300. The crevice matter is 27 inches wide. This is considered by the most experienced miners to be the greatest strike ever made in the Territory, and excels anything known in any mines on the continent. The ore is galena with sulphate, ruby and native silver.

UNION LODGE.—During the last half of the year 1872, 3,208 tons of rock were crushed giving a gold yield of \$143,975.

GOLD PRODUCT.—Helena Gazette, Jan. 30: An estimate made by J. J. Valentine of W. F. & Co., puts the total bullion product of Montana, at \$1,000,000. The universal testimony of business men, bankers and miners from all parts of the Territory, as figured up by one of our close calculators in a banking house of this city, places the yield at \$8,000,000.

MIN SHOWING.—Messrs. Keating & Blacker are reported to have a larger quantity of gold-bearing quartz mined and worked than they can crush during the year. The ore is of high grade, and will average more to the ton than that of any other year's working.

ITEMS.—Deer Lodge Independent, Feb. 1: There are but two men working in Hope Gulch at present, who are making fair wages. The water they use in sluicing is supplied by springs near by, that never freeze over. At Dog Creek, Butler & Co. are engaged in making the necessary preparations for early spring work. At Meadow Creek, or Little Blackfoot, McGuire & Ward are doing the required preliminary work on their claim, looking to an early start in the spring.

Hohart & Barton are busily engaged in taking out coal from their mine. Having completed their incline down to the water level, they are now hoisting the coal up the incline by pulley power. The mine will produce about 100 tons on the dump. Their mine improves in appearance, and the coal in quality, as they go down.

Oregon.

THE MINES.—Le Grande Sentinel, Feb. 1: Packwood & Stewart are now engaged with their quartz mill on a run of 200 tons of rock, having crushed about one-half of it. Great are the expectations as to the result, and when it is considered that the Summit Ledge, the rock of which constitutes the run above referred to, there is every reason to believe that a heavy clean-up will be made. The Conner Creek ledge (in Baker county) is richly and beautifully. The claim of Matcock & Palmer is thoroughly prospected, and is now yielding \$5 to the bucket-full of rock. In the placer mines the Eagle Creek country miners are now at work with rockers, using heated water, and are realizing from \$5 to \$7 per day.

ELDONADO MINES.—We learn that every indication exists for a heavy yield the present season. The ditch is a work of great magnitude, and will furnish water the entire season. The mines are good, not exceedingly rich in spots—and all that is wanted is water to make them yield the precious metal.

PRESERVED FLOWERS.—We saw this week a beautiful wreath of preserved natural flowers, enclosed in a handsome frame, which looked as natural and fresh as when culled from the parent stem. The wreath is made up of camelias, heliotropes, hlaes, geraniums, verbenas, orange blossoms, etc., all perfectly tautious and showing no liability to fall apart. Camellias, we think, have never before been preserved, but the operation has been performed so successfully in this instance that they will hereafter, no doubt, have a conspicuous place in preserved bouquets and wreaths. We have in California many beautiful wildflowers, which for richness of coloring and delicacy of tint, are unsurpassed, but unfortunately they wither quickly when plucked, so unless one sees them "on their native heath," their brilliancy is much impaired. By the chemical process by which the wreath mentioned was preserved, these flowers could be seen in all their native glory by preparing them immediately on the spot, and we are surprised that attempts have not been made in that direction. The wreath spoken of was made by Mrs. A. O. Cook, in April, 1872, and will shortly be placed on exhibition at Woodward's Gardens, where all such curiosities of merit readily find an appropriate nook.

SUIT AGAINST THE BORAX COMPANY.—Henry N. Wymann has commenced suit against the Pacific Borax Company and Michael Kane, Edmond Luba, Adam Merle, Justinian Caire and Joseph Mosheimer, Trustees of the corporation. The complaint states that the company commenced working in July, 1872, and since then the price of borax has been, in San Francisco, 28 cents per pound, and in New York from 30 to 36 cents per pound, and if the business was carefully managed it would prove lucrative; that the defendants (the Trustees), upon his information and belief, are colluding together to advance their own interests, that the affairs of the company have not been properly or honestly conducted by the Trustees, but that they have produced great profits to themselves, and rendered the stock almost worthless to the stockholders; that on the 15th of September, the Trustees sold to the defendant Merle, 75 tons of borax at \$100 per ton and \$100 freight, when, at the time of sale, the said borax was worth \$500 per ton. The Trustees appointed Mosheimer, Superintendent of the works, at a salary of \$500 per month, a large sum of which, \$1,500, remains unpaid. On the 6th of December, 1872, the Board sold to Merle, 75 tons of borax at \$135 per ton with freight, when it was worth \$500 per ton. That on the 26th of December, 1872, the Board appointed the defendant Caire, agent for five years for the sale of borax, paying him ten per cent. commission.

The complaint also alleges that assessments to the amount of \$36,000 have been levied; of which \$20,000 has been paid in, but if the business of the corporation were diligently managed no assessments would be necessary; that on the 31st of December, 1872, the Board levied an assessment of twenty-five cents per share, which will be delinquent on the 15th of February, 1873. The plaintiff prays for an injunction against the sale of the stock for the non-payment of the assessment; that the defendant (trustees) may be removed from office, and such as may be found guilty of gross negligence be decreed to reimburse the corporation, and that the contracts made by the trustees be declared null and void.

PRESENT PRICES. DURING 1872.

Do Pencing.....	25	@	—	Glendale St.....	17	@	—
Do Portland.....	25	@	60	Kingsford St.....	17	@	—
East'n Lumber 75	@	—	—	Corn.....	12	@	13
Do Oak, Hickory	—	—	—	Durayes.....	10	@	13
and Ash.....	150	@	350	Pearl.....	3	@	—
Shingles, Red, 3 25	@	—	—				
Laths, Califor, 3 50	@	—	—				
M. CARONI.							
No. 1, extra, per	—	—	—				
box.....	2 75	@	—				
No. 2, fine.....	1 75	@	—				
No. 3.....	1 75	@	—				
MATCHES—Jobbing.							
Parlor.....	—	—	3 25				
California.....	—	—	2				
Do.....	—	—	2				
Less usual discount to trade	—	—	—				
MALT LIQUORS.							
Jobbing.....	—	—	—				
ENGLISH BOTTLED BEER.							
Tennent's Ale, qts and pts, 3	—	@	—				
Shepherd Malt	—	—	—				
Co., Ltd., Brew-	—	—	—				
ery, bottld by	—	—	—				
Moire Co	—	—	3 25	@	—	—	—
Do Grand	—	—	—				
J. W. Bridges &	—	—	—				
Sons Stout	—	—	—				
Do.....	—	—	3 30	@	—	—	—
Do.....	—	—	3 30	@	—	—	—
Guinness' St, 3 25	@	—	—				
Blood, Wolfe &	—	—	—				
Co., Port, Ale	—	—	—				
Byass' Porter	—	—	—				
guards.....	3	@	—				
Hibbert's Porter	—	—	3 35	@	—	—	—
Port, qts & pts, 3 36	@	3 62	—				
Worthington's	—	—	3 75	@	—	—	—
Do.....	—	—	3 50	@	—	—	—
Younger's Ale, 3 50	@	3 75	—				
ENGLISH CASK BEER.							
Bars' Ale.....	42 50	@	—				
Do.....	3 50	@	—				
Tennent's do, 50	—	@	52 50	—			
Do Stout.....	40	@	—				
Marrin's Bulk	—	—	50	@	—	—	—
Do.....	—	—	50	@	—	—	—
Allsopp's Ale, 47	—	@	—				
Younger's Ale, 45 50	@	45	—				
BRANDY—Cognac.							
Sazerac.....	5 50	@	15	—			
Vineyard Pro-	—	—	15	@	—	—	—
duce, 5 15	@	—	—				
J. Hennessy, 5 40	@	10	—				
A. G. Godard &	—	—	5 50	@	8	—	—
Do.....	—	—	5 50	@	8	—	—
Clard, D. & C., 37 1/2	@	—	—				
Marcell.....	4	@	—				
Gautier Freres 5	—	@	12	—			
Do.....	—	—	12	@	—	—	—
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Marque.....	5 50	@	7 50	—			
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J. Faure & Co, 4 50	@	6	—				
J. Bellot & Co, 4 50	@	6	—				
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R. Lazard, 5 75	@	7 75	—				
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USEFUL INFORMATION.

Mysterious Fires.

The secret destructive fires, and their not-unfrequently mysterious occurrences, has lately attracted much attention to the subject of the origin of conflagrations. It appears that the Fire Marshal of New York has recently been holding steam responsible for some of the mysterious fires in that city. In reference to this surmise a cotemporary asks and answers as follows:

Can Buildings be Set on Fire by Steam-pipes?

As steam may be considered to be the most safe, healthy and economical of all modes of heating buildings, such a suspicion is to be deplored, as it is apt to raise a prejudice against it; but hot-air furnaces may be considered dangerous, as proved by the well-established evidences of the fire records, but not so with the steam heating. In fact, there is not any well-authenticated case on record wherein pipes, through which steam passes, have actually set fire to woodwork, and no one experimenter has yet succeeded in igniting wood with such pipes. We maintain that any man of science who has studied the subject of steam, or any practical engineer of common sense, knows that all that steam can do, even when superheated, is to make the woodwork hot and dry, and to pre-dispose it to catch fire. The spark must be supplied from another source; the steam tubes can never attain, outside the heating apparatus, the high temperature of 900° or 1,000° Fah. required for the red heat which is necessary to set woodwork on fire.

In this city many of the steam heating apparatuses are worked on a pressure not above 10 lbs. per square inch, in excess of atmospheric pressure, which gives a heat of 241° F. for the water in the boiler, and a somewhat less heat, of course, for the steam which circulates through the pipes. In the majority of buildings heated by steam, a common boiler is used, from which steam-pipes are carried through the premises, and an ordinary pressure for each boiler is 40 lbs. per inch, which gives a heat of 259° F. At a pressure of 120 lbs. above the atmospheric pressure, we have a heat of 355°. It will thus be seen that at pressures far above any that are used for heating purposes the heat circulated in the steam-pipes is much below that required for the ignition of wood.

That steam-pipes predispose woodwork to combustion, and even may assist the spontaneous combustion which is apt to commence in rags soaked with any animal or vegetable oil, cannot be denied; but then any heating apparatus will do the same, and steam is in this respect not so dangerous as a draft of hot air proceeding from a furnace, in which a leak may carry a spark upward, while a leak from a steam tube is utterly harmless. In regard to spontaneous combustion, any danger of that, from oil, may be avoided by using for lubrication the heavy lubricating petroleum. This material is not apt to oxidation or spontaneous heating, as one of our esteemed correspondents discovered and published in our paper several years ago; which valuable property is now also being publicly recognized in Europe.

The subjoined is a not uncommon instance of spontaneous combustion; but the conditions are such as are quite too little heeded:

Several weeks ago the new stable of S. S. Metzger took fire and burned to the ground in the midst of a drenching rain; no fire had been used about the building, and there was no way of accounting for the origin of the fire but by attributing it to an incendiary or to spontaneous combustion. The men engaged in painting and finishing Metzger's new house had been graining shutters for the house in the stable during the day before the fire, but it was scarcely thought possible that the fire could have originated from that source. The stable having been burned, the painters next day transferred their graining to the cellar of the house. That evening the inmates of the house discovered a smoke and a smell of burning cotton or paper issuing from the cellar. An examination disclosed the fact that the oiled rags used by the painters in graining had been thrown together in a corner and had ignited by spontaneous combustion, and were just burning into a flame. This timely discovery saved the house and settled the question as to the origin of the fire in the stable. Next day a nail keg was partly filled with the oily rags cast away by the painters and set in the sunshine in the yard. In a few hours the rags and keg were found to be on fire. Very few people are aware of the dangers arising from such a source.—Bedford (Pa.) Enquirer.

COAL IGNITING BY PRESSURE(?)—We often hear of coal, highly charged with sulphur and iron, taking fire from the addition of a small amount of moisture, kept short of the point of saturation; but we infer that the coal heap referred to below was not subjected to such conditions.

A Chicago paper of recent date says that the Chicago Gas Light and Coke Company received, during the summer, 10,000 tons of Pittsburgh coal, which was stored in an immense shed at the works, near Division street bridge. On Friday morning of last week flames issued from the heap, and it was soon apparent that the lower stratum was on fire, caused, it is supposed, by the great pressure producing spontaneous combustion.

The Retention and Coloring of Eggs and the Mimicry of Sounds by Birds.

A correspondent of *Nature* forwards the following interesting facts observed in New Zealand: Regarding the length of time during which a bird can retain its egg, the case is mentioned of a kingfisher that began six nests, abandoning all in turn and depositing her egg in the seventh, after working for six weeks in a condition analogous to pregnancy. The labor was incessant, three of the homes that were excavated in a turf chimney and abandoned being so far finished that a deposit of eggs must have been imminent on three occasions during the above period.

In answer to the question: Can a bird influence the color of its eggs protectively? the writer says that a female bittern, when kept in a grassy enclosure, laid an egg of a pale bluish green color, precisely like that of a heron. The egg of the bittern naturally is of an oliveaceous buff tint, which harmonizes well with the half-dead leaves of aquatic plants, of which the nest is often built. It is, doubtless, probable that the egg thus became tinged to secure for it the protection of the verdure of the grass in which it was deposited. Another and more curious instance is that of the whistler, or small cuckoo placing his egg in the nest of the blight bird. The latter is a bird foreign to New Zealand and builds a suspended nest; the eggs are clear-blue green in color. The egg of the cuckoo is greenish-dun, but in order to place it in the hanging nest, where it will be free from reptilian invaders, the writer has found cases where it has manifestly changed the color to one closely resembling that of the eggs of its dupe, so that the latter would fail to distinguish the addition to its deposit.

Referring to the mimicry of sounds, it is stated that, in camping for some days on a river-bed, the author frequently heard what he took to be one of the notes of the *hamatopus*, but that wader was nowhere to be seen; at length he traced the call to the pipio, a bird with feeble powers of flight, yet one that delights in the open glades of river beds. The mimic cry was always given when near to a stream, just where the redbill (*hamatopus*) would be likely to be found. A pair of redbills can drive away a hawk; now a hawk, "from his place on high," perceiving something near the water, might forego its swoop on hearing the mimicked note of the wary yet bold redbill. The common gray warbler, it is also stated, gives an exact imitation of the cry of the common tern, one of the boldest birds in defence of its young.

Spontaneous Combustion.

With many of the various ways by which spontaneous combustion may be effected, the public are already familiar; but late observations have developed some comparatively new sources of danger in this direction, which may be instanced in the following paragraph which we have clipped within a few days from our exchanges:

A NOVEL CASE OF INCENDIARISM, AND SOMETHING NEW IN OPTICS.—The *Industrial Monthly* says that "A mysterious fire, which twice in one day came near burning up a house in Guilford Conn., was finally traced to some tin pans, from which the rays of the sun had refracted with sufficient intensity to start a blaze at a focus some distance off." This was certainly a new way of setting a house on fire; and if, as our cotemporary states, the rays were refracted by the tin pans, it was an optical anomaly of which we wonder that he did not suggest some explanation.

OSCILLATION has a wonderful effect upon even powerful bodies if not frequently broken in the vibration. We have frequently seen notices placed at the ends of large suspension bridges, that processions must break step in crossing; this has to be done to ensure safety.

It is stated in illustration of the effect of the phenomenon in question, that when the first suspension bridge was building in England, a fiddler offered to fiddle it away. Striking one note after another, he eventually hit its vibrating note, or fundamental tone, and threw it into such extraordinary vibrations that the bridge builders had to beg him to desist. Only recently a bridge went down under the tread of infantry in France who had not broken step, and three hundred persons were drowned. The experiment is well known of a tumbler or small glass vessel being broken by the frequent repetition of some particular note of the human voice.

TO BLACKEN BRASS.—Warm the brass over the flame of a Bunsen burner or a spirit lamp, and plunge it while hot into nitric acid for two or three seconds. Then return it to the flame, and heat it till it blackens, brush off blisters, and lacquer. Another way is to use a liquid containing two parts of arsenious acid, four parts of hydrochloric acid, and one part of sulphuric acid, in eighty parts of water.

Zinc may also be given a fine black color by cleaning the surface with sand and sulphuric acid, and immersing for an instant in a solution composed of four parts of sulphate of nickel and ammonia in forty of water, acidulated with one part of sulphuric acid, washing and drying. The black coating adheres firmly, and takes a bronze color under the burnisher.

GOOD HEALTH.

The Blood-Circulation and Heart Disease.

Dr. Black, in the *Popular Science Monthly*, explains very clearly the nature and causes of heart-diseases, and refers it largely to the breathing of vitiated air. What he says about the relation between the blood and the diseases of the heart is worth special attention.

The third great vital function which influences the degenerative tendency of the heart is that of the circulation of the blood. To preserve the health of the tissues, the blood must not only be pure and rich in the materials of growth, but it must flow with a certain speed through all the blood-vessels. If the speed with which the blood moves is on the side of either *plus* or *minus* of the standard of health, disease will shortly arise. If it is on the side of *plus*, active disease of the heart, where that organ is the one to suffer, will follow. If on the side of *minus*, tissue degeneration will ensue. Active diseases will be the consequence before middle age; degeneration after that period.

These facts teach that all violent and long-continued efforts of the body should be avoided. They hurry the heart's action to an inordinate degree; they cause it to throw the blood with great force into the extreme vessels; and, as there is almost always one organ of the body weaker than the others, the vessels of this organ become distended, and, remaining distended, the organ itself becomes diseased. Running, rowing, wrestling severe horse-exercise, cricket, foot-ball, are fruitful causes of heart diseases. Those which require the breath to be suspended during their accomplishment are more fruitful causes in this respect than those, which require no such suspension of breathing. Rowing, lifting heavy weights, wrestling and jumping do this; and of these, rowing is the most powerful for evil. At every effort made with the hands and feet, the muscles are strained to their utmost; the chest is violently fixed; no air is admitted into the lungs; blood is thrown by the goaded heart with great force into the pulmonary vessels; they become distended; they at length cannot find space for more blood; the onward current is now driven back upon the right heart; its cavities and the blood-vessels of its walls become in like manner distended; the foundation of disease is laid. Hypertrophy, hemoptysis, inflammatory affections of the heart and lungs, are the consequences in the young; valvular incompetency, rupture of the valves or of the muscular fibers of the heart, pulmonary apoplexy, and cerebral hemorrhage, are too frequently the immediate consequences in those of more mature years.

Removing Pimples from the Face.

First, be assured what will not "remove pimples from the face." No drug, either administered to the stomach or locally applied, will do it. Neither will any mere local means whatever have the desired effect. The only course which promises success is purely hygienic, and has reference to the general health with the view of improving the face indirectly. Give every attention to pure air, plenty of sunshine, proper food, due exercise and thorough cleanliness. Two things are particularly important: 1. The skin must be made to do extra duty, and to this end bathe it quickly all over every morning in a little cold water, rubbing it until quite red. Two or three times in the week use soap freely. Not one person in a hundred, even of those who pretend to bathe often and much, keeps himself decent under the armpits, over and between the shoulder-blades and down the back. Think, therefore, especially to bathe and scrub and rub the parts you are most likely to neglect from their being difficult to reach. 2. Eat one-third less at each meal than you have been accustomed to eat—that is, as little as you can get along with, without actual suffering from the seeming need of food. Food should be plain and nourishing—no pastry, no nuts, no grease in any form, unless sweet butter in very moderate quantity. Avoid salt, except what comes cooked in the food, and avoid for the most part acids which will preclude the use of all fruits, except as they are cooked. The paramount points may be stated in a line when we say: Bathe much; breathe much; eat little and well; avoid pastry, grease, nuts, salt, and largely acids.—*Dio Lewis*.

WOMAN'S DRUDGERY.—The hygienic system is pre-eminently the cause of woman—both as respects the preservation of health and the treatment of disease. A simple and wholesome plan of cooking would relieve her of one-half of her present hard toil and drudgery, while it would promote the health of every member of her household. At least four-fifths of all the money expended for medicines and medical advice, are paid because of the diseases of women and children. And, nine-tenths of all the care, nursing, night-watching, and privation of sleep and rest because of sick children, are performed and suffered by women. The Medical Society in New York, which, on one of its occasions toasted woman in the following words, had truth if not poetry as the basis of the sentiment.

"Woman—God's best gift to man, and the chief support of the doctor."—*Science of Health*.

Kerosene Oil in Chronic Rheumatism.

Dr. Kemp, of Wellington, New Zealand, relates several cases that have lately come under his notice, in which the internal administration of kerosene oil has had the most marked effect on chronic rheumatism. The following is one of his cases:—J. H., aged forty-six, a sailor, had suffered from chronic rheumatism for twenty years. He never had an acute attack. He used to have agonizing twinges in his feet and legs; he compared the pain to that which would be produced by the skin being seized by a pair of tweezers and forcibly pulled. The attacks would come on about every ten minutes, and often for every three or four days and nights. He had been under medical treatment for many months, but never had more than temporary relief. He began to feel the intervals between the attacks lengthen in six weeks after commencing kerosene, and in less than three months the pains had entirely left him. After discontinuing it for some time, the pain slightly returned, but was always cured by taking two or three doses. A teaspoonful was taken in a wine-glass of water every other night. The kerosene produced no unpleasant symptoms, no loss of appetite, no effect upon the bowels or kidneys. Dr. Kemp observes, that although kerosene cannot be called a specific for rheumatism, he thinks that the cases he cites are quite sufficient to induce medical men to give it a fair trial. He is unable to find any unpleasant symptom caused by taking kerosene. The great objection with many people to taking it is the unpleasant taste and smell. Some have taken it in water or milk, but he had heard a patient say he could take it best with salt; a pinch of salt being put in the month and allowed to dissolve, and the oil then swallowed, mixed with about its bulk of water. Dr. Kemp is not aware of the remedy having ever been used internally, but he hopes some medical man will be found who will give it a trial, and record the results of their cases. Externally, it is of great use in cases of burns, whether severe or slight; it seems to relieve pain more than any other application, especially if resorted to as soon as the injury is received. Cases of severe burns have been known to heal up rapidly under its use alone.—*British Medical Journal*.

Wholesomeness of Food.

The wholesome or unwholesome character of any aliment depends, in a great measure, on the state of the digestive organs in any given case. Sometimes, a particular kind of food is called wholesome because it produces a beneficial effect of a particular character on the system of an individual. In this case, however, it is to be considered as a medicine, and can be called wholesome only for those whose systems are in the same condition. Very often a simple aliment is made indigestible by artificial cookery. Aliments abounding in fat are unwholesome, because fat resists the operation of the gastric juice. The addition of too much spice makes many an innocent aliment injurious, because spices resist the action of the digestive organs, and produce an irritation of particular parts of the system.

In any given case, the digestive power of the individual is to be considered, in order to determine whether a particular aliment is wholesome or not. In general, we can only say, that aliment is healthy which is easily soluble, and is suited to the power of digestion of the individual; and in order to render the aliment perfect, the nutritious parts must be mixed up with a certain quantity of innocent substance affording no nourishment, to fill the stomach; because there is no doubt many persons injure their health by taking too much nutritious food. In this case, the nutritious parts, which can not be dissolved, act precisely like food, which is, in itself, indigestible.

It is a very mistaken idea that the nourishment in food is according to the quantity; a person may eat a great deal of some article, and receive very little nourishment from them. The quantity of nourishment depends greatly on the aromatic flavor contained in food and whatever is insipid to the taste is of little service to the stomach. Now, the difference between good cookery and bad cookery lies principally in the development of the flavor of our food; articles properly cooked yield the whole of it; by good cookery we make the most of everything—by bad cookery, the least.—*American Rural Home*.

FATAL FLY BITES.—Deaths very frequently occur from slight punctures made by flies in warm climates. Occasionally such cases occur in temperate zones, but the cause of such a melancholy result from a slight wound in the skin does not seem sufficient to produce excessive swelling, pain, discoloration and other extraordinary appearances which are quickly exhibited. It is, therefore, possible that the insect which makes the tiny wound has its proboscis charged with an active poison from some source where it had recently been foraging, which introduced into a bleeding wound and rapidly carried by the absorbents into the system, is followed by death.

Observation on those forms of ophthalmia so common in Egypt, ending in blindness of one if not both eyes, leads to the opinion that the dreadful malady is propagated by flies, carrying on their feet and feeding tubes, purulent matter from diseased organs whence they are kept away with difficulty, to sound ones, where they are attracted by moisture on the margin of the lids.—*Ec.*

MINING & SCIENTIFIC PRESS

B. EWER,.....SENIOR EDITOR

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San Francisco:

Saturday Morning, Feb. 15, 1873.

Legal Tender Rates.—S. F., Thurs., Feb. 13.—buying 88½; selling 88¾.

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PRACTICAL CHEMISTRY.—The fifth of the Polytechnic course of lectures was delivered on the 6th inst., by Lonie Falkenau, State Assayer, on "Chemistry in the Arts." We regret that want of space forbids our publishing even an abstract of his remarks.

PROSPECTORS.—Numbers of miners are leaving Ely District daily for Death Valley and for Sacramento District, Arizona, on prospecting expeditions. With a few thousand more brave and hardy miners in Arizona, the Apaches will have to leave the more thickly settled portions of the Territory and take to the mountains.

WM. M. LENT, who went East some time since to catch Arnold, the Arizona diamond sharp, has returned to this city after an unsuccessful hunt. Mr. Lent persistently refuses to be interviewed, so the details of his trip are unknown to the public.

MINT APPROPRIATIONS.—The appropriation for the Carson Mint as fixed by the Senate amounts to \$138,000 which is yet to be occurred in by the House. The appropriation agreed upon for the San Francisco Branch Mint by both House and Senate is \$290,045.

MINING SALE.—A half interest in the St. Lawrence mine, El Dorado county, has been sold to an English company; reported consideration, \$800,000.

CHARACTERISTIC REWARDS OF MERIT.—Miniature silver bricks are said to be presented to the school children at Virginia City, for excellence in deportment, etc.

THE GOULD & CURRY MINING COMPANY are going to burn coal at their hoisting works, owing to the scarcity and high price of fuel.

THE LOS ANGELES PLACER MINES, in the San Gabriel, will do better since the late rains.

ON FILE.—Letter from Forest City.

Progress at the Rolling Mills.

The Pacific Rolling Mills, of this city, are the only works of that character on the coast and as such represent a very important branch of industry. They manufacture railroad and merchant iron, steamboat shafts, cranks, pistons, connecting rods, car and locomotive axles and frames, and hammered iron of every description. They have lately been making considerable additions to their machinery, etc., in order to keep up with their orders. The mill is now quite busy, running nine furnaces on iron besides those on holts, spikes, etc. They have three trains of rolls, two 18-inch and one 8-inch train, driven by an engine of 200-horse power. Since our last visit they have added a new rivet machine and one large punch, capable of punching a nut for a 1½ inch rod, cold. Also two small punches for washers and small nuts. This makes altogether seven punches on the latter class of work. An axle turning lathe and an axle centering lathe for cutting off any shafting cold, have been added, made at Bement & Dougherty's Industrial Works at Philadelphia. A new bolt header, that will make a bolt from ¾ of an inch to 1½ inches, is running, and four machines for cutting holts have lately been added, making altogether in the holt shop nine machines. They employ boys altogether in this department, there being, with those in the mill, 25 employed. They have just built a new machine for cutting threads in nuts that allows one boy to run 12 taps.

Three large warehouses were built last fall in which surplus stock is stored. They are conveniently situated, having a water frontage so that material can be taken into schooners or barges. The company are continually making additions to the works and are now able to turn out all railroad iron needed for the many narrow gauge railroads projected on this coast, so incorporators will please bear this fact in mind and not send East for it, but patronize home manufacturers. They have just finished a piston rod, 11 inches in diameter, for the cylinder of the steamer "Arizona," the nut on which weighed 1,200 pounds. Narrow gauge iron from 16 to 20 pounds to the yard, is being made and stacked for future emergencies. The rails for the Seattle Coal Mining Company's road, 16 miles long, were made at this mill. The rails weighed 16 pounds to the yard over which they run a seven-ton locomotive. They also made 20 miles of rail for the Nevada Central, or as it is better known, the Pioche and Bullionville railroad. These were 20 pounds to the yard; gauge 3 feet. There were about 600 tons altogether. The Black Diamond Coal Company also use this 20-pound rail on their road. The popular size for mining purposes is 16-pound, and most of the mining companies use it.

They make a specialty of stamp stems for quartz batteries which are made of three sizes, 2½, 3 and 3½ inch iron. This is kept on hand cut in lengths. The iron is made particularly for that purpose. They are now turning out nearly 40 tons per day of bar iron, and are working night and day shifts. Nine furnaces are running with four on bolts, railroad spikes, etc. About 70 boxes of railroad spikes, 30 boxes of rivets and 50 boxes of fish-joint bolts per day are turned out, the latter finished with thread and nut. In the machine holt line they can turn out 4,000 bolts per day with nut and dressed head. There are now on the dock upwards of 150 tons of fish plates and bolts for the Central Pacific railroad. Wrought iron drawheads, or humpers, are being made for the cars on the heavy grades of the Virginia and Truckee railroad; also nuts, holts, washers, flat and round iron, etc. The shoe shapes are made of the best imported Norway iron.

About 35 tons of coal per day are used at the works, all of which comes from Australia in vessels and is unloaded at the dock in front of the mills. There are five steam hammers and five engines in the mills and 11 boilers; one new boiler is now being made. Steam is made in most of them from the fire in the furnaces at no additional cost. About 250 men are at work at present in all the departments, including the bolt, forge, blacksmith, carpenter shop, etc. Rails were made at these mills for the California Pacific, Stockton and Copperopolis, North Pacific, and Oregon and California railroads. A 11-ton shaft for the steamer "Orizaba" was recently forged here which was finished up at the Risdon Iron Works.

The mills of the company are situated on the

Portrero where they have spacious grounds and a fine water frontage. They are under the superintendence of Mr. B. P. Bruner, and L. B. Benchley is business manager. The amount of business done has increased very materially within the past few years and with it the facilities for turning out a variety of work have been proportionately increased. The mills now present a very busy appearance and are well worth a visit. The forbidding notice at the entrance of "no admittance without permission from the office," has reference only to constitutional idlers, but either of the young gentlemen in "the office," Messrs. Keeney, Noble or Dana, will readily allow the curious to visit the works.

Craig and Craig vs. Fisher—Hydraulic Nozzles.

Peculiar complications frequently result where several independent inventors are seeking to supply a decided want, which has been developed in some trade or profession. The improver of a prior patent must, according to law, obtain the right to use the arrangement covered by the original patent, and as it often happens that the improvement is just as necessary to the original machine as the original machine is to the improvement, a game of "freeze out" or rather "law out" is commenced in which the longest purse wins the race. In this "game" the original patentee has the advantage, because he is supposed to be the originator or "father" of the idea, and although the improvement shows just as much originality and intrinsic value as the original invention, it must be laid upon the shelf unless the original patentee is gracious enough to yield a point *pro bono publico*. This "freeze out" game has been exemplified in the cases Craig and Craig vs. Thom and Allen, and Craig and Craig vs. Fisher, which have been assuming all the various phases of infringement suits, injunctions, cross-suits, contempt cases, etc., for the past two years.

The latest phase of this long-winded case is the incarceration of Mr. F. H. Fisher, the inventor of the Hydraulic Chief Nozzle, in the Santa Clara county jail, and a fine of \$500 for an alleged contempt of Court, in disobeying an injunction restraining him from manufacturing Hydraulic Nozzles having internal radial plates for straightening the stream of water. It was shown that Mr. Fisher purchased old nozzles upon which the royalty had once been paid to the patentee, and after removing the radial plates placed them in his new nozzle pipes, and sold them with his new machines. This Judge Sawyer declared to be an infringement of the rights of the patentee, and a violation of the injunction, hence the sentence. We are sorry to see a fellow citizen immured in jail for a minor offence, which might be just as well punished by a simple fine, but the very severity of the sentence will perhaps serve as a warning to others who might be liable to labor under a similar misunderstanding of the law. If Judge Sawyer had not interpreted the law for us and given us this example we confess that if circumstances had ever placed us in Fisher's condition we would most likely have had to suffer the same punishment, for we would not have hesitated to do as he did under the impression that we were doing nothing wrong; and we would have based our opinion upon the Law of Patents, which declares that when a machine or product which is made under a patent has once paid the patentee his royalty, it becomes an article of commerce and trade, and is liable to no further taxation in favor of the patentee. We are glad to know, however, that this clause of the law is interpreted to mean that a patentee can arrest and punish any one he finds remodelling, repairing or altering his machines, even if the royalty upon it has once been paid.

We do not take issue with Judge Sawyer in his interpretation of the law, on the contrary, we are bound to take his opinion as the proper one until it is reversed by the decision of a higher tribunal. We understand that Fisher's attorney intends to appeal the case of Craig & Craig vs. Fisher to the Supreme Court, but this will not affect the fine and imprisonment for contempt. We shall watch with interest the future developments of this case, as it promises to be both instructive and interesting.

UTAH RAILROAD AND MINING COMPANY.—A dispatch from Washington states that a bill has been introduced in the House to incorporate the Utah Railroad and Mining Company, with a capital stock of \$5,000,000, divided into shares of \$100 each. The object of the company is to develop the mining resources of Utah by constructing narrow-gauge tramways and telegraph lines so as to connect the mining districts of Stockton, Rush Valley, Ophir and Camp Floyd with a convenient point of the Utah Southern Railroad at or near Lehigh. The company is to have the right of way across the public lands of the United States not exceeding two hundred feet in width.

Changes Under the New (Cal.) Code Affecting Business Transactions.

Aware that important changes have been made in the laws of California, under the New Code, taking effect January 1st, 1873, we have requested our confidential attorneys (Messrs. Gray & Haven), to furnish us hints sufficient to warn business men from many difficulties they might likely incur without such knowledge. They have given us the following to commence with:

How the New Code Affects Business Matters.

It is impossible to state, in one article, the changes made by the new Code, for they are numerous, and extend to every branch of the unwritten law. We propose to refer briefly to some of the more prominent provisions in the new Code, which affect business transactions. Some of these are simply declaratory of the unwritten law, and some are radical changes. All distinctions between sealed and unsealed instruments are abolished.

A contract is to be interpreted according to the law and usage of the place where it is performed; or, if it does not indicate a place of performance, according to the law and use of the place where it is made.

If the terms of a promise are in any respect ambiguous or uncertain, it must be interpreted in the sense in which the promisor believed, at the time of making it, that the promisee understood it.

Time is never considered as of the essence of a contract, unless by its terms expressly so provided.

Every contract by which one is restrained from exercising a lawful profession, trade or business of any kind, is void, except in two cases, viz.: 1st. One who sells the good will of a business, may restrain himself from carrying on a similar business within a specified city or county as long as the buyer or any person deriving title from him, carries on a like business therein.

2d. Partners, may upon, or in anticipation of, a dissolution of partnership, agree that none of them will carry on a similar business within the same city or town where the partnership business has been transacted.

Personal property sold is deliverable at the place where it is at the time of the sale, or agreement to sell, or if it is not then in existence, it is deliverable at the place where it is produced.

One who sells personal property must bring it to his own door, or other convenient place, for the acceptance of the buyer, but further transportation is at the risk and expense of the buyer.

One who sells personal property knowing that the buyer relies upon his advice or judgment, thereby warrants to the buyer that neither the seller, or any agent employed by him in the transaction, knows the existence of any fact concerning the thing sold which would, to his knowledge, destroy the buyer's inducement to buy.

One who sells any article to which there is affixed a trade mark, thereby warrants that mark to be genuine and lawfully used.

One who makes a business of selling provision for domestic use warrants by a sale thereof, to one who buys for actual consumption, that they are sound and wholesome.

One who sells the good will of a business thereby warrants that he will not endeavor to draw off any of the customers.

Days of grace on negotiable instruments are abolished, and the apparent maturity of any negotiable instrument, payable at a particular time, is the day on which, by its terms, it becomes due, or when that is a holiday, the next business day.

A bill of exchange, payable at a certain time after sight, which is not accepted within ten days after its date, in addition to the time which would suffice with ordinary diligence, to forward it for acceptance, is presumed to have been dishonored.

The apparent maturity of a promissory note or bill of exchange payable at sight or on demand, is one year after its date, if it bears interest. A promissory note, payable at sight, or on demand, which does not bear interest, matures six months after its date. From the date of apparent maturity the Statute of Limitations commences to run against these instruments.

The indorsement of a promissory note payable on demand or sight without interest, is exonerated, if the note is not duly presented for payment within six months from its date, unless such presentment is excused.

SUTRO TUNNEL.—The Committee on Mines and Mining in Congress have reported in favor of the Government siding the Sutro Tunnel by a loan of \$2,000,000. A minority report was submitted by Mr. Sargent claiming that the bill proposed giving money to private mining enterprises and would destroy property of others amounting to over \$12,000,000. This meant probably the fears of the growth of a new town at the mouth of the tunnel which would depreciate the value of property in Gold Hill and Virginia. Mr. Sutro is at last successful in a measure at least, since the Committee have reported favorably on the bill, and his indefatigable energy will doubtless assist in pushing it through.

Geology as a Branch of Education.

Without underrating in the least the value of mental and moral science, we propose to speak of Geology as an instrument of education. We believe it has a fitness in this respect not possessed by any other single science. Astronomy may have a more majestic sweep, but geology dives deeper and brings up this key to God's older revelation. It is a great feat to measure a planet, but to tell its genesis and genealogy is a greater. "Geology, in its highest sense, is not so much one science, as the application of all the natural sciences to the examination and description of the creation and structure of the earth. It is not a geographical mineralogy, for paleontology is its most interesting feature. It does not consist in the mere collection of fossils for show or classic haphazard; it has a far higher mission than to label phenomena. It is no more a 'heap of facts' than literature is a heap of words; it is an intelligible sentence. Nor does its importance rest upon its practicality. It does indeed unlock the treasures of the mineral kingdom. It is the farmers' and miners' and builders' best friend. It has to do as much with dollars and dimes as the calculation of the banker. Never was anything more clearly made than the intimate relation between the lowest province of political economy and the loftiest reach of scientific investigation. "How effectual and sublime the education of such a science, when the very stones are gifted with a power of exhaustless meaning, and call into action our highest and holiest energies! Not only does geology yield directly a rich harvest of wonderful truth; it also disciplines the mind in a new and living way. He who will follow out the logos of the earth in all its hearings, will reach the full strength and stature of an intellectual man. Who has not felt that the humblest flower asked him questions he could not answer. A host of questions still flock around us as we turn over the rocky leaves of the book of Nature, and put our finger on the very print of that hand that laid the foundations of the earth. Nor does the stream of knowledge stop here; it swells till it spreads itself into heaven. Like the rill which by and by becomes a brook, a river, a gulf, an ocean,—so every attainment promises more. The only positive apology for the man who derides geology as a study is, that he has never taken the first lesson. We repeat the charge that it is a visionary pursuit. Like every other truth—like the sun itself—it did rise amid the mists of the morning; but now it shines unclouded from the zenith. Geology, said Hugh Miller, no longer journeys amid the waste of chaos; it has got firm footing on the continent of fact. It is a philosophy of ascertained laws. Types, classes, orders, families, genera and species, are not mere artificial devices to facilitate study; they are founded in Nature. It is an unfinished science, but for that very reason it is admirably adapted to rouse the whole energy of the student. It presents the finished outline of a landscape of untold wealth.

We ask for geology a prominent place in the curriculum of our colleges and schools. How woefully ignorant of nature are many of our graduated men. Nature—the very book whose letters are largest and the only gospel now preached to every creature, is the one in which the mass of mankind read not a lesson, and see not a line. Like Hamlet's ghost, they have "no speculation in their eyes." The sun, coming forth from his chambers and fulfilling his circuit, excites no feeling but that of warmth and convenience. A fossil—the symbol of a divine thought—the sepulchre of a creature that was over the lord of creation—is tossed into a stone-wall without the slightest notice. And yet this lack of observation and reflection is not owing to any deficiency of intellect or taste, but to a neglect or perversion of their powers. The native tendency of the mind is strangled at its birth; the greenness of the Spirit is dried up in the hot race for riches or rank.

A FIRST-CLASS MAGAZINE.—The last two numbers of *Scribner's Monthly* surpass any yet issued in the variety and excellence of the illustrations. The cuts with "New Ways in the Old Dominion" are beautifully executed, as in fact are all that appear in this magazine. The publishers announce a forthcoming series of illustrated papers on "The Great South," by Mr. Edward King. "Arthur Bounicastle," Dr. Holland's story, will be continued through the year. The publishers furnish for \$4 a year a work which contains not only an immense amount of information and pleasant reading, but descriptive illustrations, which gives the general reader a better idea of localities or occurrences than any writing can do.

LECTURE TO LADIES.—Mrs. Dr. E. P. Stone is delivering a series of interesting lectures to the ladies of Oakland on the subject of Physiology. The lectures are plain common sense explanations of anatomy with as few technicalities as possible. Mrs. Stone has a life-size model of a human being which can be taken apart in such a manner as to present to view the structure of the human body in a manner to be understood.

Smith's Fire Kindler.

Everybody knows what a nuisance it is to make a fire early on a cold morning. Something which tries a man's patience more than anything we can think of. You get your hands dirty, perhaps cut your fingers in whittling up shavings to start it, and after all it may go out and have to be made all over again. When people try to start one quickly by pouring coal oil upon it they frequently furnish an "accident" item for the papers, and put their relations to the expense of a funeral. This course is not only inexpedient but expensive. Coal oil starts a fire beautifully, but handled as it usually is, it is extremely dangerous even in the hands of a careful person. But now comes a good Samaritan bearing the somewhat common name of Smith, who invents a little device of practical utility by which coal oil can be used for lighting fires without being in the least degree dangerous.

This invention is represented in the accompanying cut from which its nature can be seen at a glance. A, represents a can for the purpose of holding the coal oil, which is usually kept about half full. B, is a fire-proof porous



substance, which when not in use is immersed in the oil in the can A. C, is a cork, on the other end of the wire holding the substance, B, which prevents the oil from evaporating, or being spilled. The ball, B, becoming saturated with the oil by being kept in it will readily burn with a hot flame when lighted, and it is only necessary to place it under the wood or coal in the stove to light the fire. When the oil is all burned out it can be placed in the can for future use. This little device is one which will be found useful in every family in the land, as it will kindle wood or coal, either coarse or fine in an incredibly short space of time, and one Kindler will last a life-time. The porous substance being fire-proof is indestructible, so all that is consumed is the coal oil. Weister & Co., No. 17 New Montgomery street, are agents for this Coast, and the implement can be examined at their office.

A VEIN OF LIME FOUND IN NEBRASKA.—The Lincoln, Nebraska, *State Journal* says that there has been discovered in Seward county, that State, a vein of lime, seventeen feet thick, which is so free from carbon and other foreign substances that it can be used for plastering without burning, it only being necessary to slack with water and mix with the ordinary quantity of sand. Adjoining the quarries where this discovery was made a town has been laid out, which is called Pittsburgh, and a number of houses erected, all of which are plastered with the lime from the vein near by. In the same quarries a stratum of silicate of magnesia was found, which is pronounced by experts to be equal, if not superior, to the silicates of New Jersey, which are used extensively in the manufacture of glass and for glazing pottery. Careful analyses are being made of these and other substances found in the vicinity.

As lime in the condition above referred to will slack on the application of water, we suppose we are to accept as a consequence of its existence there the fact that "Seward County," Nebraska, is never blessed with rains, and that the soil there is always as "dry as a limekiln." These conditions being admitted, we are willing to receive as truth the above assertion, without the further evidence of the "careful analyses" alluded to as "being made."

NEW FLUME.—A flume will be built next spring from Lake Tahoe to Truckee, following the course of the river; length, fifteen miles. The flume will be built for the purpose of floating lumber, railroad ties, mining timber, wood and shingle blocks.

EXPLOSION.—Last week the cupola of the melting furnace at Taylor's foundry, at Grass Valley, was blown off. Bricks, etc., were hurled a distance of 300 yards, and several parties slightly but not seriously hurt.

A NUGGET, worth \$450, was picked up last week in Wyman's Ravine, on the Garden Ranch. It was found in tailings thrown out by Chinamen, who paid \$2,500 for a claim of two acres.

The "Creeping" of Rails.

A correspondent of the *Railroad Gazette* notes the following curious facts, for which he asks an explanation: Four hundred and fifteen miles of track, on a road running north and south, were laid, between 1850 and 1861, with the fish-bar joint fastening, similar to that now in general use. The differences in the elevations of the north and south ends of the track does not exceed 150 feet—the southern end being the lowest—and the grades undulate; but at no point is a greater elevation attained than 200 feet above or 125 below the southern end. On about one-half of the distance the track was laid with both rail joints on the same cross tie, and the balance with "broken joints." The rails were not "slotted," neither were any "stop chairs" used to prevent the track from "creeping." The track has been in use from 11 to 20 years, and the creeping of both rails has been southward, and the western has crept much faster than the eastern. In places where the grade does not exceed 5 to 8 feet per mile, for 20 to 30 miles, the joints of the western are now opposite to the center of the eastern rails, while the latter have also moved southward. On the heaviest grades descending northward, there is little or no tendency to move down hill or northward. Perhaps some of your readers can explain why the western rails creep faster than the eastern.

Having seen the above paragraph copied into several of our technical journals without any answer to the query propounded, we will venture the application to the "creeping" of rails on roads running north and south, the same theory that is given as a cause for the more rapid wearing away of the western banks of rivers, which run south or north, viz:—the rotation of the earth on its axis. This movement, being from west to east, has a tendency to throw the waters of rivers running parallel with the earth's axis against their western banks; and hence the more rapid wearing away on that side.

So of a railroad train, the eastward motion of the earth, in its daily revolution, presses the flanges of the wheel against the west rail, and causes it to move either north or south, according as the excess of transportation is in the one direction or the other, or as the north or south end of the road is more or less elevated than the opposite extreme. In the case cited, the southern end of the road being some 150 ft. lower than the northern the rails very naturally move down hill. The fact that this motion in railroads, can be accurately determined, may be considered not only as positive proof of the supposed action of the water upon river banks; but also of the truth of the theory generally accepted as its cause.

Mineral vs. Town Sites.

The following letter was recently received at the United States Land Office in reply to a letter addressed to the Commissioner of the General Land Office.

DEPARTMENT OF THE INTERIOR,

GENERAL LAND OFFICE,

WASHINGTON (D. C.) January 21, 1873.

Register and Receiver, Sacramento, Cal.—GENTLEMEN: In your letter of the 7th of September last, you state that on the 10th of October, 1871, Charles Nagler et al. filed in your office an application for patent for a Placer claim, situated in section 13, township 12 north, range 9 east, and section 18, township 12 north, range 9 east, Mount Diablo meridian, and that on the 13th of the same month Charles F. Irwin, County Judge of El Dorado county, Cal., filed with you his declaratory statement No 3,173, claiming certain lands as a town site, in trust for the inhabitants of the town of Greenwood, about thirteen acres of which is embraced by the said application of Nagler et al.

In view of these facts you ask if said applicants will be allowed to make entry of their said mining claim.

The town site Act of March 2, 1867, expressly declares "that no title shall be acquired under the provisions of this Act to any mine of gold, silver, cinnabar or copper," and the Act of June 8, 1868, declares that "no title under said Act of March 2, 1867, shall be acquired to any valid mining claim or possession held under the existing laws."

If, therefore, Nagler et al. have a bona fide mining claim, which they held by virtue of compliance with the local laws and regulations and the congressional enactments, situated within the exterior boundaries of the premises embraced by said town-site application, they will be allowed to enter the same upon full compliance with the law and instructions.

You will inform all persons in interest and acknowledge the receipt hereof.

Very respectfully, your obedient servant,
WILLIS DRUMMOND, Commissioner.

THE MINING LAW.—A bill has been reported in the Senate of the United States by Mr. Hamlin, from the Committee on Mines and Mining, providing that the fifth section of the mining act of May, 1872, in relation to the expenditure of labor and improvements on claims located prior to that act, shall be so amended as to extend the time for the first annual expenditure on such claims until December 1st, 1873.

PATENTS & INVENTIONS.

Telegraphic List of U. S. Patents Issued to Pacific Coast Inventors.

[REPORTED OFFICIALLY FOR THE MINING AND SCIENTIFIC PRESS, DEWEY & CO., PUBLISHERS AND U. S. AND FOREIGN PATENT AGENTS.]

By Special Dispatch, Dated Washington, D. C., Feb. 11th, 1873.

FOR WEEK ENDING JANUARY 28th, 1873.

FILTER.—Prosper Huerns, S. F., Cal.
CULTIVATOR.—Amos B. Colver and John Priest, Albany, Oregon.

"The patents are not ready for delivery by the Patent Office until some 14 days after the date of issue. NOTE.—Copies of U. S. and Foreign Patents furnished by DEWEY & CO., in the shortest time possible (by telegraph or otherwise) at the lowest rates. All patent business for Pacific coast inventors transacted with greater security and in much less time than by any other agency."

Hydes' Steam Plows.

Mr. Oliver Hyde of this city, inventor of Hyde's patent steam plows has completed this week a very large plow, which is to be tested on the tule lands of the San Joaquin. One of them has been used this season on Putah Creek, Solano county, in ordinary ground, and performed its work satisfactorily, but was compelled to stop since the roads became so bad they were unable to haul fuel for the engine. The new plow is the largest yet built, being 40-horse power. The machine is about 20 feet long by 8 feet wide, and from the ground to the top of the smoke-stack is 12 feet. The front wheels are 6 feet in diameter and 24 inches wide. The hind wheels are 6 feet in diameter by 30 inches wide. These wheels are made after Mr. Hyde's patent, and have rubber rolls, on top of which are secured blocks of wood so that when the weight of the plow is upon them they flatten down considerably and thereby give more surface on the ground than would be the case with a rigid tire in a wheel of equal dimensions. They are made of wrought iron, the spokes being of gas pipe, thus ensuring strength and lightness at the same time. The boiler is five feet in diameter and six feet in height, containing 204 tubes. It has patent circulating tubes, consisting of one tube within another, which are also the invention of Mr. Hyde. This is the first application which has been made of this method and the results will be interesting.

The machine is to be sent to Venice Island on the San Joaquin river and will be employed in plowing tule land. The island belongs to J. Mora Moss, Mr. Nicholson and others. Mr. Hyde is certain that it will be able to perform its work as successfully on tule as on ordinary land. The soil at the place where it will be set at work has never been touched. The machine will cut a furrow 9 feet 4 inches in width. The one used on Putah creek was only 25-horse power and cut 7 feet wide. There are two engines on this one, each with a 10 inch cylinder and 12 inch stroke. It has eight plows 22 inches in diameter. On the other one there were only five plows, but they were 30 inches in diameter. These machines are made by the California Steam Plow Company, who operate with Mr. Hyde's patents. The whole thing is made up of a number of California inventions and is particularly applicable for our large ranches. Mr. Hyde will go with this plow to its destination and run it for awhile himself. He is deserving of great credit for the pertinacity he has shown in overcoming the difficulties in bringing the different parts of the plow to perfection, which is evident from a glance at the mechanism of the machine. We hope that it will prove successful in its work for it will undoubtedly be of great benefit to this State.

New Incorporations.

STEVENS' PACIFIC SMOELTING AND M. Co.—Object, to bring into general use and sell Levi Stevens' patents. Capital stock, \$1,000,000. Trustees—L. Ireland, R. M. Shackelford, James Waters, S. C. Abbott and A. Craig. **WATCOBIA M. AND SMOELTING CO.**—Dec. 11. Location: Inyo Co., Cal. Capital stock, \$2,000,000 in shares of \$100 dollars each. Trustees—James Brady, of Inyo, Harry L. Haskell, Camp Independence, Harry C. Egbert, Camp Independence, Wm. Alvord, Nathan Porter, Albert Bierstadt, and John Hewston, Jr., of San Francisco.

PAGE TUNNEL CO.—Dec. 11. Location: Big Cottonwood District, Utah Territory. Capital stock, \$5,000,000 in shares of \$100 each. Trustees—N. Page, L. J. Lewis, George Middlemass, Edward McLean and Stephen W. Howland.

A dispatch from Pioche, Feb. 9th, says: The South Side Mining Co., to operate in Ely District, Nevada, was incorporated here yesterday. Capital, \$3,000,000; Trustees—E. T. Brown, D. C. Clark, Wm. H. Atkinson, Gibson Clark, E. T. Badgley.

INCREASE OF CAPITAL STOCK.—"420" M. Co.—Capital stock increased from \$1,680,000 in 30,000 shares, to \$3,000,000 in 30,000 shares.

ELECTION.—BLOSSOM ROCK M. Co.—Feb. 12: Trustees—A. C. Bassett (President), Peter Short (Treasurer), J. J. Whitney, W. S. Papp, James Wheeler and L. R. Spaulding, Secretary, R. Stevenson.

MINING SUIT.—A suit has been instituted by Michael McCoughlan against the Ophir Mining Company for \$20,000 damages for injuries sustained while coming out of the mine in a cage:

THE largest saw-mill in the world is in Saginaw Bay, opposite Bay City. It has cut 370,797 feet of lumber in a day, and employs 300 men. Since 1865 it has turned out 180,153,917 feet.

DEWEY & CO.,
American & Foreign Patent Agents,

OFFICE, 238 MONTGOMERY STREET, S. F.
The best, speediest, and surest method for you to obtain patents, file caveats, or transact any other important business with the Patent Office at Washington, or with foreign countries, is through the agency of DEWEY & CO., PUBLISHERS OF THE MINING AND SCIENTIFIC PRESS, SAN FRANCISCO, an able, responsible, and long-established firm, and the principal agents on this side of the continent. They refer to the thousands of inventors who have patronized them, and to all prominent business men of the Pacific Coast, who are more or less familiar with their reputation as straightforward journalists and patent solicitors and counselors. We not only more readily apprehend the points and secure much more fully and quickly the patents for our home inventors, but with the influence of our carefully read and extensively circulated journals, we are enabled to illustrate the intrinsic merits of their patents, and secure a due reward to the inventor, besides serving the public who are more ready to give a fair trial, and adopt a good thing, upon the recommendation of honest and intelligent publishers.

To Obtain a Patent,
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These Machines Stand Unrivaled.
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They are constructed so as to apply steam directly into the pulp, or with steam bottoms, as desired.
This Amalgamator Operates as Follows:
The pan being filled, the motion of the miller forces the pulp to the center, where it is drawn down through the aperture and between the grinding surfaces. Thence it is thrown to the periphery into the quicksilver. The curved plates again draw it to the center, where it passes down, and to the circumference as before. Thus it is constantly passing a regular flow between the grinding surfaces and into the quicksilver, until the ore is reduced to an impalpable powder, and the metal amalgamated.
Settlers made on the same principle excel all others. They bring the pulp so constantly and perfectly in contact with quicksilver, that the particles are rapidly and completely absorbed.
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ment shall remain unpaid on the 25th day of February, 1873, shall be deemed delinquent, and will be duly advertised

for sale at public auction, and unless payment shall be made before, will be sold on Friday, the 21st day of March, 1873, to pay the delinquent assessment, together with costs of advertising and expenses of sale. By order of the Board of Directors.

T. W. COLBURN, Secretary.

Office, Room 3, 419 California street, San Francisco, California.

The Metropolitan Gas Company—Location

of works, San Francisco, in the County of San Francisco, State of California.

Notice is hereby given that at a meeting of the Board of Directors of said Company, held on the 15th day of January, 1873, an assessment of Five (5) Dollars per share, in gold coin, was levied upon the capital stock of said Company, payable on or before the 1st day of February, 1873, to the Secretary of said Company, at the office of said Company, No. 304 Pine street, San Francisco, Cal. Any stock upon which said assessment shall remain unpaid on the said 1st day of February, 1873, shall be deemed delinquent, and will be duly advertised for sale at public auction, and unless payment shall be made before, will be sold on Saturday, the 15th day of March, 1873, to pay the delinquent assessment, together with costs of advertising and expenses of sale.

A. B. HICK, Secretary.

Office, No. 304 Pine street, San Francisco, Cal. j25-4t

Mount Jefferson Milling and Mining Company—Location

of works, First Carotte, Tuolumne County, California.

Notice—There are delinquent upon the following described stock, on account of assessment levied on the eighteenth (18th) day of December, 1872, the several amounts set opposite the names of the respective shareholders as follows:

Names.	No. Certificate.	No. Shares.	Amount.
Bowwell, S. B., Trustee....	47	1000	\$150 00
Deane, Coll....	95	50	7 50
Galloway, W. T., Trustee....	61	150	22 50
Lewis, L. J....	5	500	75 00
Lewis, L. J....	6	500	75 00
Lewis, L. J., Trustee....	48	100	15 00
Lewis, L. J., Trustee....	54	50	7 50
Lewis, L. J., Trustee....	66	100	15 00
Lewis, L. J., Trustee....	90	100	15 00
Lewis, L. J., Trustee....	110	100	15 00
Richardson, E. A., Trustee....	17	1380	207 00
Richardson, E. A., Trustee....	31	200	30 00
Richardson, E. A., Trustee....	32	100	15 00
Richardson, E. A., Trustee....	33	100	15 00
Richardson, E. A., Trustee....	37	100	15 00
Richardson, E. A., Trustee....	71	100	15 00
Richardson, E. A., Trustee....	73	100	15 00
Richardson, E. A., Trustee....	77	100	15 00
Richardson, E. A., Trustee....	81	200	30 00
Richardson, E. A., Trustee....	84	200	30 00
Richardson, E. A., Trustee....	90	200	30 00
Richardson, E. A., Trustee....	107	200	30 00
Richardson, E. A., Trustee....	112	100	15 00
Richardson, E. A., Trustee....	113	100	15 00
Simmons, Wm....	100	100	25 50
Simmons, Wm....	101	10	1 50
White, U. H., Trustee....	111	100	15 00
White, U. H., Trustee....	114	100	15 00
White, U. H., Trustee....	115	100	15 00

And in accordance with law, and an order of the Board of Directors, made on the 18th day of December, 1872, so many shares of each parcel of said stock as may be necessary, will be sold at public auction, at the office of the Company, No. 419 California street, San Francisco, Cal., on the 17th day of February, 1873, at the hour of 1 o'clock P. M., of said day, to pay the delinquent assessment thereon, together with costs of advertising and expenses of sale.

J. W. CLARK, Secretary.

Mohave Consolidated Gold and Silver Mining Company—Location

of works, Mohave County, Arizona Territory. Location of principal place of business, No. 507 Montgomery street, San Francisco, Cal.

Notice—There are delinquent upon the following described stock, on account of assessment levied on the 7th day of January, 1873, the several amounts set opposite the names of the respective shareholders as follows:

Names.	No. Certificate.	No. Shares.	Amount.
Jno M Murphy....	2	100	\$10 00
Jno M Murphy....	4	100	10 00
Jno M Murphy....	3	100	10 00
Jno M Murphy....	11	100	10 00
Jno M Murphy....	12	100	10 00
Jno M Murphy....	14	100	10 00
Jno M Murphy....	15	100	10 00
Jno M Murphy....	20	150	15 00
Jno M Murphy....	22	100	10 00
Jno M Murphy....	24	100	10 00
Jno M Murphy....	46	400	40 00
Jno M Murphy....	48	400	40 00
Jno M Murphy....	51	200	20 00
Jno M Murphy....	53	200	20 00
Jno M Murphy....	57	100	10 00
Jno M Murphy....	63	10	1 00
Jno M Murphy....	122	500	50 00
Jno M Murphy....	120	200	20 00
Jno M Murphy....	135	50	5 00
Jno M Murphy....	137	20	2 00
Geo Daly....	17	50	5 00
Dwight German....	27	200	20 00
William Jones....	30	500	50 00
Mary A Fletcher....	65	80	8 00
William Jones....	65	20	2 00
Chas E St wart....	67	100	10 00
Jarvis Jewett....	68	10	1 00
Francesque Mondell....	72	150	15 00
Geo Reiter....	82	100	10 00
Geo Reiter....	83	100	10 00
Richard Wheeler....	90	500	50 00
Chas Spencer....	107	100	10 00
Chas Spencer....	108	100	10 00
Chas Spencer....	111	200	20 00
Chas Spencer....	112	200	20 00
T G Berry....	114	500	50 00

And in accordance with law, and an order of the Board of Directors, made on the 7th day of January, 1873, so many shares of each parcel of said stock as may be necessary will be sold at public auction, at the office of the Company, on the 3d day of March, 1873, at the hour of one o'clock P. M., of said day, to pay the delinquent assessment thereon, together with costs of advertising and expenses of sale.

T. E. JEWELL, Secretary.

Office, 507 Montgomery street, San Francisco, California. feb15

Noonday Silver Mining Company—Location

of works, White Pine District, Nevada.

Notice is hereby given that at a meeting of the Board of Directors of said Company, held on the 14th day of January, 1873, an assessment (No. 13) of Twenty Cents per share was levied upon the capital stock of said Company, payable immediately, in United States gold coin, to the Secretary, at the office of the Company, No. 28 Hayward's Building, California street, San Francisco, California. Any stock upon which said assessment shall remain unpaid on Saturday, February 22d, 1873, shall be deemed delinquent and will be duly advertised for sale at public auction, and unless payment shall be made before, will be sold on Monday, the 17th day of March, 1873, at 1 o'clock P. M., to pay the delinquent assessment, together with costs of advertising and expenses of sale. By order of the Board of Directors.

JOSEPH P. NOURSE, Secretary.

Office, Room No. 26, Hayward's Building, 419 California street, San Francisco, California. feb15

Ohio Consolidated Gold Mining Company.

Location of Works, West Point, Calaveras County, California. Principal place of business, San Francisco, California.

Notice is hereby given that at a meeting of the Board of Directors of said Company, held on the 11th day of February, 1873, an assessment of ten cents per share was levied upon the capital stock of the corporation, payable immediately in United States gold coin, to the Secretary, at the

office of the company, No. 422 Montgomery street, San Francisco, California.

Any stock upon which said assessment shall remain unpaid on the fifteenth day of March, 1873, will be delinquent, and advertised for sale at public auction, and unless payment shall be made before, will be sold on Saturday, the 15th day of April, 1873, to pay the delinquent assessment, together with costs of advertising and expenses of sale. By order of the Board of Directors.

W. A. KNAPE, Secretary.

Office, 422 Montgomery Street, over Donahue & Kelly's Bank, San Francisco, California.

Ophir Copper, Silver and Gold Mining Company—Location

of works, Ophir, Placer County, California.

Notice—There are delinquent upon the following described stock, on account of assessment levied on the 19th day of December, 1872, the several amounts set opposite the names of the respective shareholders as follows:

Names.	No. Certificate.	No. Shares.	Amount.
Mrs E Brandt....	315	50	\$ 15 00
Wm J Speyer....	309	24 3/4	7 35
H C Swain....	318	50	15 00

NEW STOCK.

Names.	No. Certificate.	No. Shares.	Amount.
W J Kip, Jr....	8	500	50 00
W J Kip, Jr....	9	500	50 00
W J Kip, Jr....	10	500	50 00
Geo P Rogers....	12	75	7 50
Chas F Brown....	21	600	60 00
James H Garas, Trustee....	25	300	30 00
R G Brush....	27	1000	100 00
Wallace Everson, Trustee....	29	600	60 00
H C Swain, Trustee....	31	500	50 00
H C Swain, Trustee....	32	500	50 00
H C Swain, Trustee....	33	302	30 20
Mrs Emma Brandt....	34	150	15 00
Mrs Emma Brandt....	35	300	30 00

And in accordance with law and an order of the Board of Directors, made on the 19th day of December, 1872, so many shares of each parcel of said stock as may be necessary, will be sold at public auction at the office of the Company, room 2, Express Building, 402 Montgomery street, San Francisco, California, on the 17th day of February, 1873, at the hour of one o'clock P. M., of said day, to pay the delinquent assessment thereon, together with costs of advertising and expenses of sale.

O. H. BOGART, Secretary.

Office, room 2, Express Building, 402 Montgomery street, San Francisco, California. feb1

Rail Road Consolidated Mining Company—

Location of principal place of business, Room 10, No. 328 Montgomery street, San Francisco, California.

Location of Works, Railroad District, Elko County, State of Nevada.

Notice—There are delinquent upon the following described stock, on account of assessment, No. 1, levied on the seventh day of January, 1873, the several amounts set opposite the names of the respective shareholders, as follows:

Names.	No. Certificate.	No. Shares.	Amount.
Burkes, S. S....	40	100	\$ 15 00
Burkes, S. S....	92	200	30 00
Burkes, S. S....	93	25	3 75
Burkes, S. S., Trustee....	unlimited	1500	225 00
Burkes, S. S., Trustee....	39	600	90 00
Brewster, George P., Trustee....	45	25	3 75
Brewster, George P., Trustee....	46	25	3 75
Brewster, George P., Trustee....	47	25	3 75
Brewster, George P., Trustee....	48	25	3 75
Brewster, George P., Trustee....	49	25	3 75
Brewster, George P., Trustee....	50	25	3 75
Brewster, George P., Trustee....	51	25	3 75
Brewster, George P., Trustee....	52	25	3 75
Brewster, George P., Trustee....	53	25	3 75
Brewster, George P., Trustee....	54	25	3 75
Brewster, George P., Trustee....	55	25	3 75
Brewster, George P., Trustee....	56	25	3 75
Cullen, Robert....	3	200	30 00
Cullen, Robert....	21	90	13 50
Cullen, Robert....	22	150	22 50
Cullen, Robert....	23	150	22 50
Cullen, Robert....	24	90	13 50
Cullen, Robert....	25	60	9 00
Cullen, Robert....	26	60	9 00
Cullen, Robert....	27	100	15 00
Cullen, Robert....	28	100	15 00
Cullen, Robert....	29	100	15 00
Cullen, Robert....	30	100	15 00
Cullen, Robert....	31	50	7 50
Cullen, Robert....	32	50	7 50
Cullen, Robert....	33	50	7 50
Cullen, Robert....	34	50	7 50
Cullen, Robert....	35	30	4 50
Cullen, Robert....	36	100	15 00
Cullen, Robert....	37	150	22 50
Cullen, Robert....	38	150	22 50
Cullen, Robert....	39	50	7 50
Cullen, Robert....	40	50	7 50
Cullen, Robert....	41	50	7 50
Cullen, Robert....	42	50	7 50
Cullen, Robert....	43	50	7 50
Cullen, Robert....	44	25	3 75
Cullen, Robert....	45	500	75 00
Cullen, Robert....	46	500	75 00
Cullen, Robert....	47	500	75 00
Cullen, Robert....	48	500	75 00
Cullen, Robert....	49	100	15 00
Cullen, Robert....	50	100	15 00
Cullen, Robert....	51	100	15 00
Cullen, Robert....	52	100	15 00
Cullen, Robert....	53	100	15 00
Cullen, Robert....	54	100	15 00
Cullen, Robert....	55	100	15 00
Cullen, Robert....	56	100	15 00
Cullen, Robert....	57	100	15 00
Cullen, Robert....	58	100	15 00
Cullen, Robert....	59	100	15 00
Cullen, Robert....	60	100	15 00
Cullen, Robert....	61	50	7 50
Cullen, Robert....	62	50	7 50
Cullen, Robert....	63	50	7 50
Cullen, Robert....	64	25	3 75
Cullen, Robert....	65	500	75 00
Cullen, Robert....	66	500	75 00
Cullen, Robert....	67	500	75 00
Cullen, Robert....	68	500	75 00
Cullen, Robert....	69	100	15 00
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Cullen, Robert....	129	15	2 25
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Cullen, Robert....	142	15	2 25
Cullen, Robert....	143	15	2 25
Cullen, Robert....	144	15	2 25
Cullen, Robert....	145	15	2 25
Cullen, Robert....	146	15	2 25
Cullen, Robert....	147	15	2 25

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Iron and Locomotive Works.

INCORPORATED.....APRIL 30, 1863.
CAPITAL.....\$1,000,000.

LOCATION OF WORKS:

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Manufacturers of Steam Engines, Quartz and Flour Mill Machinery, Steam Boilers (Marine, Locomotive and Stationary), Marine Engines (High and Low Pressure). All kinds of light and heavy Castings at lowest prices. Cams and Tappets, with chilled faces, guaranteed 40 per cent. more durable than ordinary iron.

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LIGHT AND HEAVY CASTINGS,

of every description, manufactured. 24v16qr

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Machinery and Castings of all kinds.

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IRON CASTINGS of all descriptions at short notice. All orders punctually executed in time agreed on. Particular attention paid to making superior Shoes and Dies. Among the special castings of this Foundry are the well known CALLAHAN GRATE BAR, of superior merit for burning screenings—all size Bars. STRATTON'S JACK SCREWS, all sizes. Superior, compact and effective Horse Powers, Pumps, Agricultural Castings, Ingot Moulds, Assaying and Refining Retorts and Kettles, and a great variety of other and special castings.

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Steiger & Boland are the sole Manufacturers of the Improved Hepburn Roller Pan. The patterns having all the improvements to those Pans, are at the Occidental Foundry, enabling the Establishment to deliver all pans and parts thereof with uniformity, finished in the best style, and at the lowest possible price. Pan Castings furnished the trade, with liberal facilities for erection, etc. All persons are cautioned against making, selling or using these Pans, except through the authorized agents and manufacturers, viz., Steiger & Boland, of the Occidental Foundry, S. F.

22v25-3m

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PRICES MODERATE.
J. H. WEED V. KINGWELL

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Office, 315 California street. A. J. SEVERANCE,
CHAS. W. RANDALL,
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THEODORE KALLENBERG,

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and Maker of Models for Inventors. All kinds of Dies
Stamps and Punches made. Also, all kinds of
Small Gears Cut.

Repairing done on very Reasonable Terms and in the
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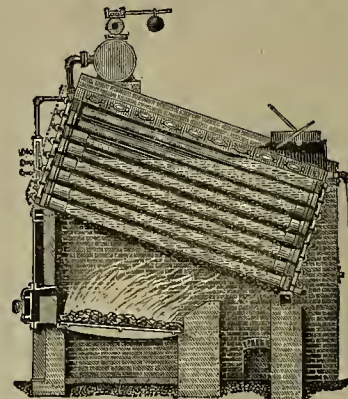
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GENERAL MACHINISTS.

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NOTICE.—Special attention called to our new STEAM
PUNCHING PRESS, which we have on hand for use of
customers. Capacity, 1800 per hour. All kinds of Dies
and Punches made to order. 23v25-3m

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IMPROVED AND PERFECTED

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FIVE YEARS' EXPERIENCE,

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For all manner of uses.

Send for Circular, and for further information address

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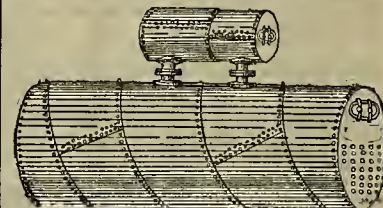
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San Francisco Boiler Works,

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High and Low Pressure Boilers of all
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SOLE MANUFACTURERS OF THE CELEBRATED
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SHEET IRON WORK of every description done
at the Shortest Notice.

All kinds of JOBBING and REPAIRING promptly
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OF ALL KINDS,

Built according to Drawings or Specifications, and
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Repairing promptly attended to, and at reasonable
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Steam Boiler Manufactory

— OF —

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(Successor to D. McDonald.)

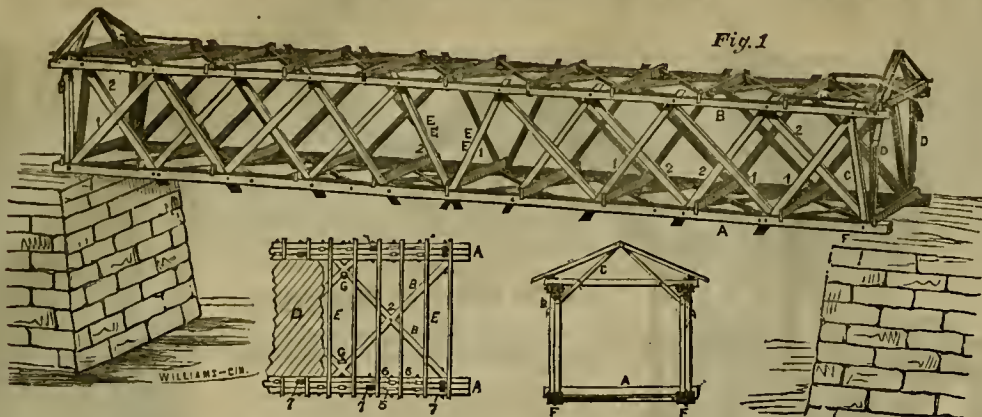
Oregon street, below Front.....SAN FRANCISCO.

ALL SORTS OF STEAM BOILERS

Made to order and repaired.

Also all kinds of Sheet Iron Work done promptly,
and at prices to suit the times. 25v25-3m

PACIFIC BRIDGE COMPANY.



WORKS NEAR SOUTH POINT MILL, BERRY STREET, SAN FRANCISCO, CAL.

Are Prepared, with Superior Machinery, to Manufacture and Build all kinds of Bridges on Smith's, Howe's, and other Improved Plans. Framing of all kinds done by Machinery.

The Smith Bridges have been thoroughly tested in the East for Three Years, and wherever tried have proved superior to any other Bridge in the following points:
Being built of wood entirely, they are not affected by change of temperature.
The timber used is placed so directly in the line of strain, that less material is required to support the same load.
It is not perceptibly affected by shrinkage. It is the most Economical Bridge built. It is adapted to any practicable LENGTH OF SPAN.
Plans, Specifications and Terms will be sent to any County, Township or Person wishing to build a Bridge, and no charge made unless the Plan is used. For all Public Bridges the Plan will always be open to competition.
Smith's celebrated CAST IRON PIER, economical, and adapted to heavy currents, built at low rates.
C. H. GORRILL, Secretary. W. H. GORRILL, President.

From the Mining Summary in the Gold Hill News of December 28th,
The New Root Boiler
IS A PERFECT SUCCESS.
The saving in the amount of fuel consumed, alone amounting to 30 per cent. less than the cost of running the same machinery with the old style of Boilers.
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Manufacturers and have constantly on hand
SPORTING,
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POWDER,
OF SUPERIOR QUALITY, FRESH FROM THE MILLS. It being constantly received and transported into the interior, is delivered to the consumer within a few days of the time of its manufacture, and is in every way superior to any other Powder in Market.
We have been awarded successively

Three Gold Medals
By the MECHANICS' INSTITUTE and the STATE AGRICULTURAL SOCIETY for the superiority of our products over all others.
We also call attention to our

HERCULES POWDER.
Which combines all the force of other strong explosive now in use, and the lifting force of the best blasting powder, thus making it vastly superior to any other compound now in use.
A circular containing a full description of this Powder can be obtained on application to our Office,
16v20-3m JOHN F. LOHSE, Secretary.

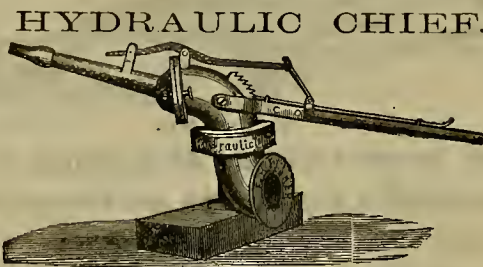
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ALL KINDS Hydraulic ELEVATORS, REVERSIBLE Hoisting Engines, STEAM AND HYDRAULIC ENGINES
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IS THE Cheapest and Best Hydraulic Machine in use.
The only reliable party in the Hydraulic business who protects his patrons.
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For Pulverizing Quartz,
"Charleston Rock," and all Native Phosphates, Flint, Feldspar, Iron Ore, Manganese, Antimony, Carbon, Corundum, Old Crucibles, Barytes, Brinstones, Slate, Soapstone, Graphites, Glass, Marble, Plaster, Anthracite and Bituminous Coals, etc.
WM. STEWART'S
Patent Bone Mills and Crushers.
For Grinding Bones, Rock, Quartz, and all hard substances; also, Corn, Wheat, Oats, Barley, Coffee, Spices, etc.

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REAPER AND MOWER SECTIONS, BARS AND KNIVES COMPLETE,
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Wagon Maker and Blacksmith,
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Wagons, Trucks and Carts of every description manufactured to order on the shortest notice. Repairing of all kinds promptly attended to and all work guaranteed to give satisfaction. 4v16-3m

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PATENT APPLIED FOR.
The Great Labor Saver of the Household.
ECONOMY, CONVENIENCE AND SAFETY COMBINED.
JUST THINK OF IT—No Wood, no Coal, no Gas, no Stove Pipe, no Chimney, no Smoke, no Ashes, no Dirt, no Wood Boxes, no Coal Scuttles, no Kindling Wood, but a Friction Match, and the Fire in Full Blast in Half a Minute!
OVEN HOT IN TWO MINUTES.
Steak broiled in seven minutes! Baked Beans in thirty minutes! The fire is extinguished in a moment! And the house unheated! It has no rival in all kinds of Cooking and Flat Iron Heating, and combines Economy, Convenience, Neatness, Safety and Durability! The Ladies Welcome it; a little CHILD can operate it, and
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Prices from \$6 to \$25, according to size.
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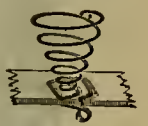


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Manufacturers of Files of every Description
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MILL SAW FILES A SPECIALTY.
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THE
Risdon Iron and Locomotive Works
Corner Howard and Beale Streets,

Are prepared to make **SHEET IRON AND ASPHALTUM PIPE**, of any size and for any pressure, and contract to lay the same where wanted, guaranteeing a perfect working pipe with the least amount of material.
Standard sizes of railroad Car Wheels, with special patterns for Mining Cars. These small wheels are made of the best Car Wheel Iron, properly chilled, and can be fitted up with the improved axle and box—introduced by this company, and guaranteed to outlast any other wheels made in this State.
All kinds of Machinery made and repaired.
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WARNER & SILSBY
Manufacture all sizes of
Bed and Sofa Springs,
Which they offer to the trade at reduced prices; also the celebrated **Obermann Self-Fastening Bed Spring.**



Any man can make his own Spring Bed with them by attaching them to the slats of any bedstead.
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OKAYE'S WELLINGTON KNIFE POLISH. Packets, 3d. each; tins, 6d., 1s., 2s., 6d., and 4s. each.
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The Zine Collar Pad is guaranteed to cure the worst cases of raw and inflamed sore neck in Ten Days, and work the horse every day, or money refunded; and will not chafe or wear the mane off of the neck. For sale by Saddlery, Hardware, Stationers and Harness Makers. Manufactured by the Zine Collar Pad Co., Buchanan, Mich. feb-17

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APPLY TO
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Corner Sansome and Halleck streets, SAN FRANCISCO. feb-1m

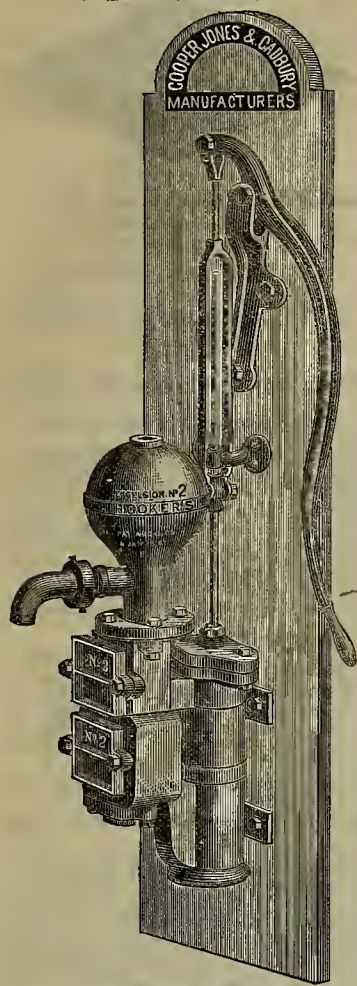
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PATTERNS AND MODELS,
(Over W. T. Garratt's Brass Foundry).
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JOS. THORNHILL, 1612 Mason Street, near Green. C. W. WHITE, 47 Clay Street.
OS. THORNHILL,
Bricklayer and Contractor
Particular attention paid to all kinds of FIRE WORK, such as **BOILERS, FURNACES, OVENS, GRATES, RANGES, etc.**

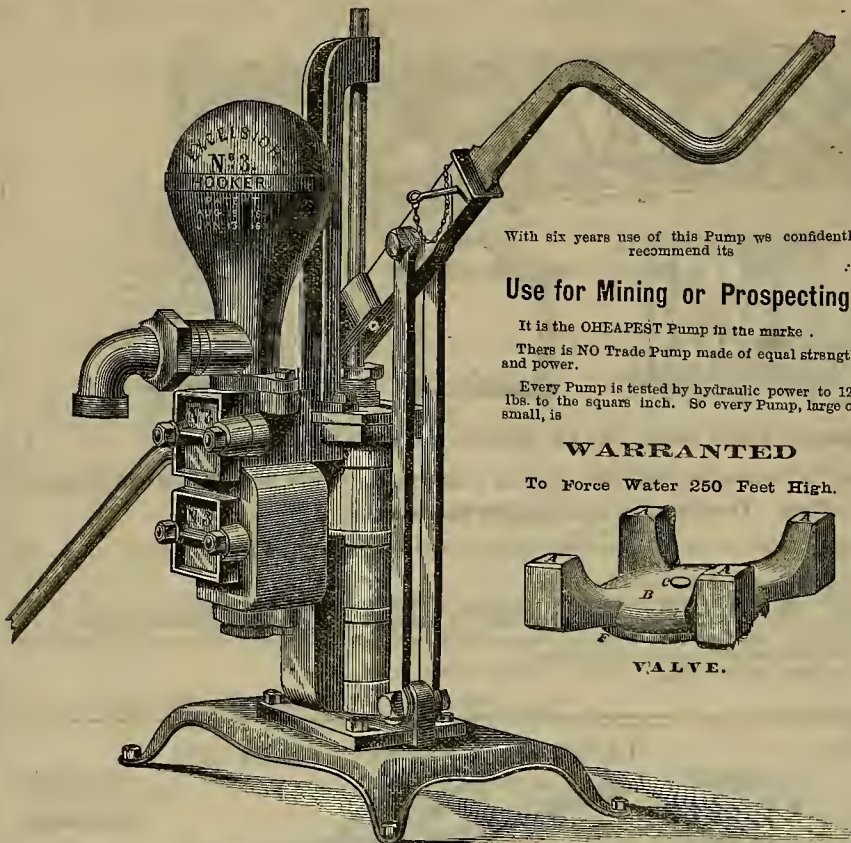
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The public are respectfully cautioned that BETTS'S Patent Capsules are being in ringleading Merchants at home and abroad, and he is the ONLY INVENTOR and SOLE MAKER in the United Kingdom.
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Underground Treasures—How and Where to Find Them,
A KEY FOR THE READY DETERMINATION
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BY JAMES ORTON, A. M.
A work of rare value to every person, and worth ten times its cost. Price only \$1.50.
Send for full descriptive circular to
F. DEWING & CO.,
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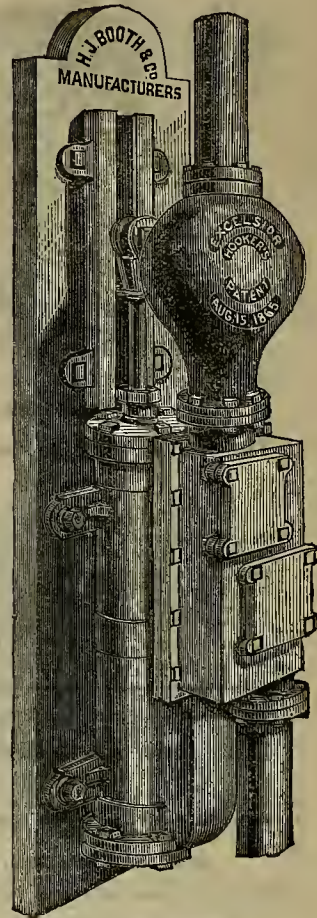
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NO. 3-SHIP.



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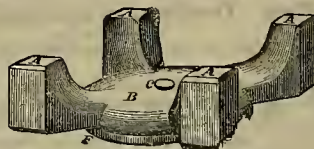
With six years use of this Pump we confidently recommend its

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It is the CHEAPEST Pump in the market.
There is NO Trade Pump made of equal strength and power.
Every Pump is tested by hydraulic power to 126 lbs. to the square inch. So every Pump, large or small, is

WARRANTED

To Force Water 250 Feet High.



VALVE.

ALL PUMPS WARRANTED. All Expense of Transportation Refunded if the Pumps are Proved Defective.

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HALLIDIE'S Patent Endless Wire Ropeway. Covered by Numerous U. S. Patents.

IMPORTANT TO
Mining Companies, Civil Engineers, Contractors, Etc.

The system of transporting material, such as Ores, from the mine to the mill, Earths for embankments, Rock from quarries, etc., by means of steel wire rope, has been well tested and found more economical, advantageous and reliable than any other method of transportation; and to the annexed certificates in connection therewith I beg to call the attention of those interested:

EUREKA, Nevada, July 10, 1872.
T. M. MARTIN—My dear sir: On your leaving for San Francisco, it gives me great pleasure to hand you my written acceptance of the HALLIDIE TRAMWAY put up by you upon our mine in Freiburg.

It is a perfect success, discharging ten tons of ore per hour with two men's labor. It is perfectly simple in construction, and, as far as I can judge, there is nothing about it to ever get out of order—nothing to wear out. While ours requires but about two thousand five hundred feet of wire rope, I can see no reason why the line could not be extended almost indefinitely with equally happy results. Again, the carrying capacity might be doubled or quadrupled if desired. After several weeks trial upon our mine, the unanimous verdict of all who have seen it is a complete, unquestioned success. If this can be of any service to you, use it in any way you think proper. Very respectfully, C. C. GOODWIN, Superintendent, Office, Sept. 23, 1872.

T. M. MARTIN, Esq.—Sir: The Ropeway came erected by you (HALLIDIE'S PATENT) for the Emma Hill Consolidated Mining Company, has been built in a most substantial and workmanlike manner, and is at this time in splendid working condition. I most cheerfully accept the work for the Company, and I recommend it to others wishing a cure and speedy transit for ores over places impracticable for wagon roads, etc. Respectfully, L. W. COLBATH, Superintendent, Emma Hill Consolidated Mining Co., Little Cottonwood, Utah, Superintendent's Office, Oct. 23, 1872.

T. M. MARTIN, Esq.—Sir: With pleasure I testify to the fact that the endless wire Ropeway (HALLIDIE'S PATENT) built by you for this Company, has been for a month or more in daily operation, and that it answers admirably the purpose of its construction. The structure is put up in a workmanlike manner, the machinery works smoothly and the cable is completely under the control of the brakes, man. In fine, the work in its operations is a success. Respectfully yours, WM. C. CAMPBELL, Clerk of Co. (Signed)

The Vallejo Ropeway.
The Vallejo Tunnel Company's Tramway in Little Cottonwood, built on the HALLIDIE PATENTED PLAN, is a complete success. It is between 2,300 and 2,500 feet in length, and is supported by thirteen stations. The fall in the distance is about 600 feet, and the wire rope, which is three-fourths of an inch in diameter, will easily and easily deliver one hundred tons in six hours. The machinery is automatic, loading and unloading the sacks or buckets. About one t n and a half can be sent down at one time. The stations are about two hundred feet apart, and the entire apparatus is strong and safe. As the wire rope is elevated about forty feet above the surface of the hill, the Tramway can be worked all winter long, without the slightest trouble.—*Utah Mining Journal, Salt Lake, Sept. 23, 1872.*
Mining Companies and others desiring to negotiate for the erection of this system of Ropeway, can communicate with me personally, or through Postoffice Box 964.

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MINING AND SCIENTIFIC PRESS

An Illustrated Journal of Mining, Popular Science and Progressive Industry.

BY DEWEY & CO., Patent Solicitors. SAN FRANCISCO, SATURDAY, FEBRUARY 22, 1873. VOLUME XXVI. Number 8.

Improved Automatic Safety Cage.

[Written for the SCIENTIFIC PRESS by A. BLATCHLY.]

The Comstock lode has been worked on a more extensive scale and to a greater depth in a shorter time than any mine known in the records of mining. It has been systematically worked only about twelve years, and already the greater amount of ore taken from it comes from over one thousand feet from the surface. If the present efficient system is continued, and even if the Sastro Tunnel should prove of no benefit, in fifty years it will have been worked to the depth of four thousand feet. No mine is worked to that depth at the present time and it is doubtful if but few will ever pay to work so deep, but judging from past developments the Comstock will pay to work to that or even greater depth.

In the future history of mining with the use of modern improvements and those which will be invented, no mine of the precious metals will last a thousand years, like some European mines, unless they are too poor to pay for the application of the most efficient means for operating deep mines. In the Comstock the ore being rich and in large masses it is a desideratum to extract it as speedily as possible. No expense has been spared to obtain the most perfect machinery known to modern mining engineering. Though the pumps are not as large as those required in mines containing more water, still they are made from the best patterns and in the most desirable style of workmanship. The steam engines both for hoisting and pumping are first-class; the blowers for ventilating are those which experience has shown to be the best, the Root having the preference, since being a pressure blower, is better adapted to deep mines than fan blowers.

The safety cages have also received a due share of attention. Every hoisting shaft is provided with guides, on which the cages traverse, and by an arrangement of springs or eccentrics the hoisting-rope is so secured to the cage that if the rope breaks the guides are clutched by the teeth of the eccentric, and the descent of the cage is instantly arrested. Few or no accidents have occurred in the use of this style of cage, unless the brakeman neglected his duty, and the ascending cage, not being stopped at the proper time, ran with great force against the sheave over which the rope runs, breaking the safety arrangement and precipitating the cage to the bottom of the shaft. Several accidents of this kind have occurred, and a number of lives have been lost by them.

The object of the device shown in the cut is to make the action of the engine and brake automatic, after the cage rises to a certain height and the brakeman does not perform his duty.

Our cut represents the mouth of a hoisting-shaft. A is the sheave over which the hoisting-rope runs. B B are levers regulating the action of the hoisting-engine and the brake. D is a weight attached to one end of the double rope X, which passes over the pulleys, c, c, c, the other ends of which are attached to the levers, B B. This rope passes over the shaft at such a height that when the levers B B are operated properly, the top of the cage does not touch it, but if the levers are not operated the cage passes up until it comes in contact with the rope X, which immediately moves the levers and stops the cage, before it rises so high as to do any harm.

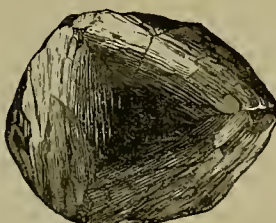
The weight D should be of such size as will

give sufficient force to the action of the levers, but no more.

This arrangement is self-working and convenient. Every hoisting-shaft should be provided with one of these automatic Brake Operators, as they are cheap and efficient, and any man with ordinary skill can apply it.

A Munificent Donation to the Cause of Science.

The members of the California Academy of Sciences were pleasantly surprised at the last meeting by being made the recipients of a deed for a piece of land for building purposes, which is valued at about \$150,000. The donor is Mr. James Lick, who recently made the California Pioneers a similar gift. The lot given to the Academy fronts 80 feet on Market street, and is 275 feet deep on one side and 195 on the other. It begins on the southeasterly line of Market street, 195 feet southwest from the southwest corner of Market and Fourth streets, and runs thence eastwardly and parallel with Fourth street 195 feet; thence southwest at



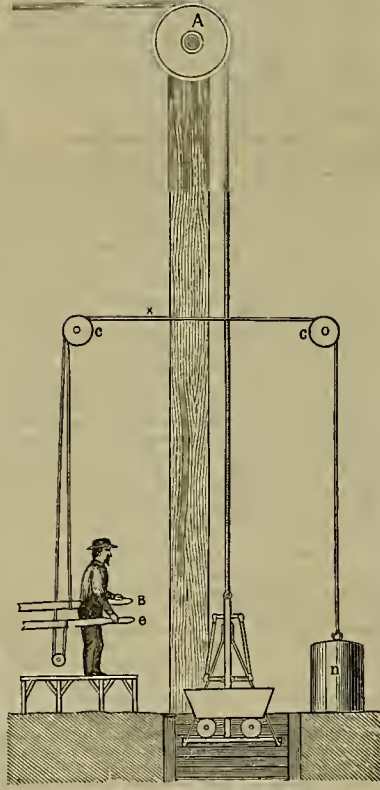
THE \$2,000,000 DIAMOND.

an angle of 45 degrees to a point 275 feet from the southwest line of Market street, which last mentioned point constitutes the southwest corner of the 100-vara lot; thence northwest and parallel with Fourth street 275 feet to the southeasterly line of Market street; thence northeast and along the line of Market street to the point of commencement. This constitutes 100-vara lot, number 126, of the city of San Francisco.

Mr. Lick states that he makes this gift to the Academy of Sciences in consideration of the desire he has to promote the diffusion of science and the prosperity and perpetuity of the Academy. The conditions under which the land presented is to be accepted are somewhat strict, taking into consideration the chronic impecuniosity of scientific associations, and the California Academy in particular. The premises must be used and devoted exclusively for scientific purposes and none other, nor shall they ever be encumbered in any manner. They must not be sold during the life time of any existing members of the association, nor must any part of the building be leased or rented for any purpose foreign to the institution. They must erect and forever maintain on the premises an edifice that shall cover nearly all the premises except enough to afford light and ventilation. The building must, in the terms of the deed, cover a space of 80 by 225 feet, be three stories in height, built of brick with granite front, faced with appropriate scientific emblem, with a classic design such as will readily distinguish it from buildings need for business or commercial purposes. The necessary funds to commence and complete this structure must be secured within two years from the date of the deed, and it must be finished with reasonable dispatch. Three rooms only are specified, one for a library, another for a museum, and

another to be suitably constructed for a hall for lectures.

Notwithstanding the restrictions laid down by the donor, the academy think they can raise the necessary funds to comply with its obligations within the stated time, and therefore accept the present. As such a building as the one described will not cost less than \$100,000, some other of San Francisco's wealthy citizens must also aid the cause of science by contributing the means to erect it. The members of this association have been struggling along for twenty years in a set of dingy apartments, while their more fortunate brethren in the Eastern States and Europe have had fine build-



AUTOMATIC BRAKE OPERATOR.

ings, abundance of means and everything necessary for collecting a museum and displaying it to advantage. This is the first instance on this coast where a donation of any kind whatever has been made to the cause of science, and the first present the Academy ever received, with the exception of cabinet donations. Should the moneyed men of San Francisco aid the scientific men, the purposes of the gift will be carried out, and we trust that they will not let it go by default when the two years are up for want of means. Let a few of our California street millionaires reserve some of their large profits from mining operations and donate them to the Academy. It is doing much good in the community, and achieving practical results. Mining in particular owes much to science, as in fact does every department of human industry. It investigates and elucidates principles which eventually lead to beneficial results to the public in general, and by its observations of detail furnishes facts which the inventor or mechanic apply to the concerns of every day life.

Mr. Lick deserves the hearty thanks not only of our own community, but those of the workers in the cause of science all over the

world, since he stands alone among the many rich men of our Golden State, as the only one who has opened his purse spontaneously and given any aid to the cause of science. The location of the property is in a growing part of the city and on a street where it is probably as valuable per front foot as any in town. It only remains now for the wealthy men to assist in erecting a building which will be not only an ornament to our city, but a monument to perpetuate their names as its founders.

A Valuable Diamond.

The accompanying cut is a representation of the exact natural size of a large diamond found at Waldek's Plant, Vaal river, South Africa, November 6th, 1872, by Robert Spaulding's party. An old citizen of this place has written to General A. M. Winn, of this city, and enclosed a photograph of this gem, which we have copied. It is irregular in shape, and about an inch and one-eighth in diameter. The diamond is one of the first water, and weighs 288 1/4 carats. Its value is said to be fully \$2,000,000. It may be mentioned for the benefit of excitable readers that such "finds" as this do not occur every day, nor every month, and even if they did, the gem would materially decrease in value. It is hardly probable that Mr. Arnold, of "diamond field" fame will purchase this one, although he might have told the man to "throw it in with the others" if it had been in the store where he procured his miscellaneous "calt" for the Arizona Fields. Some of our mining friends can, however, by seeing a cut of this precious stone, realize what "might have been" had the bogue fields only proven genuine.

AN INVENTION WANTED.—Some sort of an appliance is sadly wanted by means of which a telegraphic operator can communicate with, or signal a train at any place on the route. If an invention filling this requirement were made it would be of great benefit to the public as well as to the inventor. If it had been possible to signal the train as it passed along the road beside the telegraph wires, the recent accident on the Central Pacific railroad would have been avoided, since the fact of two trains being on the track, and running towards each other, was known at Elko before the collision occurred.

Cannot some of our ingenious inventors set their brains at work and overcome this difficulty. Electricity has almost been made to speak and has been turned to so many uses that it is highly probable some system might be devised whereby an electric signal would warn an engineer to slow up his train to avoid impending danger. Whatever the system it must be made to operate cheaply and be constructed in such a manner that a train may be signalled at any point on the line of road. Let us hear from some one on the subject.

ENGLISH AND AMERICAN COAL MINES.—English coal veins are usually from 2 ft. 4 in. to 2 ft. 10 in. thick, while the American bituminous coal veins are usually from 4 to 8 ft. thick, and the anthracite veins from 20 to even 50 ft. thick. This great disparity in the thickness of the veins is the reason why coal cutting machinery has never been introduced into the American mines. There is little economy in employing cutting machinery in a six-foot vein, while it greatly adds to the economical working of a 2 or 2 1/4 ft. vein.

THE WINNEMUCCA mine in Bingham Cañon, Utah, netted its owners over \$600,000 during the past year.

CORRESPONDENCE.

Placer Mines Near Forrest City.

[Written for the MINING AND SCIENTIFIC PRESS.]

Pioneer Days and Operations.

Forrest City has experienced its full share of the vicissitudes common to most early mining camps in California. The ravines in the neighborhood, enriched by the Blue Lead, which crosses the country here, paid when first worked most liberal wages. With the partial exhaustion of these deposits the more exposed and easily reached portions of the main lead were attacked through drifts and shafts, and for a number of years some twenty or thirty companies, employing several hundred men, did well at this business. Meantime, a good many tunnels were started for those sections of the old river channel that were more deeply buried or supposed to lie further back. Then came

The Era of Stampedes.

When the California miners, eager to exchange these impoverished diggings for virgin placers, and ignorant of the buried wealth they were really abandoning, hurried off to distant fields of labor, leaving their claims and often also the costly improvements made upon them; most of which afterwards fell into a state of irreparable decay. Neglected so long the tunnels caved in or swelled shut and the shafts were filled up; and when these men came back, as many of them did, it was to find their grounds very often in the possession of others, and the works that had cost them so many hard days' labor well-nigh useless.

During this period of absenteeism two or three companies kept work going on their claims, the principal of these being

The Live Yankee.

Who owned a tract having a frontage of 360 by a depth of 2,600 feet on the Blue Lead south of the town. This was opened by a long and costly tunnel, commenced now nearly 20 years ago, and which was afterwards maintained in a state of repair at considerable expense. From '54 to '63 inclusive, this company took out \$713,777, of which nearly one-half was paid out in dividends. After this the net earnings fell off materially, the dividends amounting to only about \$10,000 per year. The richer portion of the gravel being washed out nothing has for some time past been done on this claim; though it is possible it may yet be worked by hydraulics or portions of it be reopened for drifting purposes.

The Highland and Masonic Claim.

Another of those that were worked for a long time without intermission, lies near the town, and has had a very chequered history. It was first opened by means of a shaft and supplied with costly hoisting and pumping works, which were afterwards burnt. The yield was large but owing to the original outlay and heavy current expenses, not much profit accrued, and the claim was finally sold for debt. It was afterwards opened by a long bed-rock tunnel and for a time turned out as much as \$100,000 per month, after which it again fell off and finally dwindled away to almost nothing. The water in this claim, notwithstanding the quantity is considerable, is so acidulous that sheets of zinc exposed to its action are soon eaten up entirely, and shovels left in it for a short time are so eroded as to be unfit for further use.

The North Fork

Is another of these old companies, that with some intervals, have kept work in progress about Forrest City. They own a very extensive and valuable section of the Blue Lead adjoining the Bald Mountain ground on the northwest, and which they are now opening with a bed-rock tunnel, already in over 2,000 feet, with about 1,000 more to run before reaching the channel. They have been at work on this tunnel several years, and it will probably require another year to complete it, much better progress being made now since the single hand drill and giant powder were introduced.

The only largely productive claim, however, in the immediate vicinity of Forrest City, and that which now imports more life and business to the place than any other, is that of

The Bald Mountain Company.

Situate close to and a little north of the town. The members of this Company, 20 in number, are mostly working miners, who deserve great credit for the industry and perseverance as well as the good judgment shown in opening their ground, which covers a broad space on the main blue lead. The tunnel nearly 2,400 feet long is a well constructed and costly work, the most of it performed by their own labor. They are meeting with a merited success, which, besides enriching themselves, is likely to prove of great benefit in encouraging other parties owning grounds here to go ahead and open them up. This plan of practical miners uniting their claims, or securing enough of others to make up a good extent of ground, and then associating their labor for driving a tunnel, is one that

should be more generally adopted, now that this business is attended with so much less hazard and requires so much less time and money than formerly.

The experience of this Company is of value also in showing that parties going after these old channels should not be discouraged, even if the first gravel reached fails to come up to their hopes, or if they meet with other disheartening circumstances in the exploitation of deposits so unique in themselves and marked often by great eccentricities. When 500 feet in, some auriferous gravel was found on top of the bed-rock, but it was of very low grade. A thousand feet in, another streak was encountered of somewhat better character, but, still not rich enough to warrant removal. At 1,300 feet a shaft was raised 12 feet above the tunnel when a three-foot stratum of gravel, blue and compact, was broken into, which on being prospected, paid at the rate of \$3.19 per car-load. To most men this would have been entirely satisfactory; but it was not exactly the material our young friends were after—did not quite come up to the standard of the genuine Blue Lead gravel about Forrest City, so they pushed ahead another hundred feet, when, raising up again, they broke into a thin layer of dark blue gravel, exceedingly hard and well stocked with gold, showing that they were in the rich pay streak of the main lead.

Obstacles and Discouragements.

For the first 250 feet in, the tunnel of this company was run on a low grade. At this point the bed-rock was encountered, indicating the necessity of a raise; 500 feet in, the grade was made still steeper—1 foot in 12, which was maintained for some distance. The bed-rock, composed here partly of serpentine but mostly of talcose slate, rises and falls at certain places in a manner to greatly perplex the miner, tempting him sometimes to raise his tunnel only to find, after proceeding a short distance, that he has been betrayed into a mistake.

Finding the inner extremity of their main tunnel too high, this Company have obviated this trouble by two branches, the one starting out to the left 1,200 feet in, and the other to the right 1,400 feet in, and which, after making a slight elbow turn and run nearly parallel with the main tunnel, but on a lower level. Through these side tunnels the gravel is now brought out; 1,800 feet in, a turn-out, 100 feet in length has been constructed, where the cars pass each other.

The Stratum of Pay Gravel Here

Varies from 2 to 4 feet in thickness; but the most of it is so very hard that only about one foot, and often not more than 6 inches of the richest portion is removed; and in breaking out this, the gad, and sometimes also blasting, has to be employed. After removal, much of it has to be crushed with a sledge hammer before the gold can be extracted from it by washing. Scarcely more than two-thirds of the gold-bearing gravel is taken out, the balance being left with a view to its being hereafter extracted and crushed with stamps. Although the Company have over a mile of sluices set along Oregon Creek much gold is necessarily left in the tailings, which will also at some future time be worked over. To make room for the drifters, the top of the bed-rock, here much decomposed, is removed for two or three feet. Though so friable it carries no gold to a greater depth than two or three inches, nor is any found in the crevices and pot-holes, the latter being filled with bits of wood, leaves and sand.

Modes of Working, Yield, Value, Etc.

Although several hundred feet of fine gravel had before been penetrated, no main gangways were run until 1,800 feet in from the mouth of the tunnel. They are 300 feet apart, the sub-gangways being 65; the latter, where the gravel is extremely hard, being sometimes wider, as it is found cheaper to shovel the dirt a greater distance than to cut numerous gangways.

A great economy has been effected here in substituting giant powder, and the single hand-drill for the old style of explosive and mode of drilling; the men, all of them old California miners, preferring the former, as they allege, on the score of both health and comfort.

It was only during the past summer that the Bald Mountain Company got their dump-yard, sluices and other outside works in shape, and commenced running out gravel. They have since extracted some 20,000 car-loads, which will average very nearly \$10 each—their estimate being half an ounce to the car-load, and this gold being worth \$18.30 per ounce. It is mostly coarse and easily saved when once freed from its containing cement and gravel.

Prior to December last, 45 men were employed in this mine. At that time the dump yard being full, without water for washing, the number was reduced to 30. Now, that there will be no further trouble about the water supply, the force will be increased as speedily as possible, it being the intention of the company to employ 100 hands as fast as suitable men offer, they having a preference for whites and old Californians. They pay \$3 per day in gold—board and lodging at the hotels in the town \$7 per week. This company have ground sufficient to last them for a great many years, indeed so long that this feature is not much consulted in estimating the value of their mine.

To Mr. H. Wallis, Superintendent, and to Messrs. Clough, McGregor and Gilson, the latter, Secretary, and all members of the company, I am indebted for the foregoing information, and also for the courtesy of being shown through the underground works of this interesting, valuable and well conducted property.

H. D.

Forrest City, Sierra county, Feb 3d, 1873.

California at the Vienna Exposition.

EDITORS PACIFIC RURAL PRESS:—The question is now being agitated both in the Eastern States and in California, what shall we send to the Vienna exhibition? In the East they have many sources to draw from to make a great exhibition; but here our resources are but limited. We cannot show what would be our greatest pride to show, the great productiveness of our soil, or the beauty of our climate. Our fruits and vegetables cannot go there only in a preserved state, and would lose much of their good effects. But I would like to suggest that if it is a possible thing that we send a section of our big trees, say a cross section sawed from some of the largest trees to be found with the bark on, and from twelve to eighteen inches thick; it would probably be a difficult job to get, and would cost much money, but I think there would be plenty to take the job if well paid.

Only imagine a wheel cut from the end of a tree thirty-three or thirty-four feet in diameter. Would all the other products of the State we could exhibit there, create half the wonder and astonishment that would. That would bring facts to them that they could not deny. The wonderful size of California fruits, vegetables and other productions have been beralded to all parts of Europe, but by most people they are looked upon as California yarns and passed over without thought, but those that hear it from parties they fully credit and believe, do not realize their immense size.

Suppose we take thirty feet in length and saw out a plank, you could cut and cover the whole gable end of a two story house thirty feet wide, with a base four feet, first story twelve feet high, second story ten feet and the gable seven; the width of the plank would reach to the ridge of the house; by comparison with some familiar object like the house, one will realize the size better than by telling the number of feet.

The good from such an exhibition would not end with the exhibition at Vienna, but could be then exhibited through all the large cities of Europe, and if desirable could even be made to pay all expenses in a short time. If you think the thing practicable you can use this as a starter.

PIONEER.

Sacramento, Feb. 1873.

STILL ANOTHER SAFETY CAGE.—A new safety cage is to be seen at the Belcher works, Gold Hill, in which is displayed some very fine work in the way of iron forging. The builder, William Bray, proposes to show his confidence in the safety arrangement by standing on the cage and allowing the cable by which it is suspended to be cut, when he will either fall about three inches or go clean to the bottom of the shaft. By many it is pronounced the best safety cage yet introduced, and it may be that it is; but we are of the opinion that it would be better with wrought iron or steel eccentric clutches than with the present ones of cast iron. However, we are not to stand on the cage when the rope is cut, so we will withdraw our one objection. We once saw Captain Sam Curtis, now Superintendent of the Virginia Consolidated, and another man, whose name we do not now remember, stand on a safety cage at the old Savage works and allow the cable to be cut above their heads, with about a thousand of open shaft under their feet. They fell about an inch, which was no further than our hair raised, and not as far as two inches as that on the heads of the men on the cage, was elevated. That fall of one inch must have seemed at least 100 feet to them. We want to see no more such experiments—once is a dose for all time.—*Virginia Enterprise*.

PROF. SHEAFER lately delivered an address before the Scientific Department of Lafayette College upon coal, reviewing its importance as a fuel, and the effect it will have upon the strength and power of nations. He said: "Practical as well as analytical tests fail to supply an acceptable substitute for coal. England must soon yield to America in the great competitions of the nations. The strength of both is in their coal mines, and in England these have already reached nearly or quite their maximum while our anthracite is but partially developed, and our bituminous coals are scarcely touched.

"But though Pennsylvania's store of anthracite will last for many years, and long after it is drawn upon to supply England, it is useless to deny that there is a limit to the supply, and that after a time it will be exhausted. Then what shall we do?"

"We shall proceed to open the grand reservoir, the bituminous coal fields, compared to which our anthracite beds are but as a mill-pond to the Gulf of Mexico. With a bituminous area of 12,000 square miles in Pennsylvania, and 197,000 in the United States, we can supply the world with fuel for ages to come."

PROPORTION OF LOCOMOTIVES TO RAILS.—Prof. Rankin says the weight of rails per yard in length should equal fifteen times the greatest load on the locomotive drivers in tons. Perdonet, in France, takes twelve instead of fifteen. The Philadelphia and Reading railroad, on rails made with great care by the company, prefers not to exceed 4 tons on a 64 lb. rail.

Seam Mining.

However it may be with some other residents of El Dorado county, the writer of these lines was, until quite recently, totally ignorant of the character and method of what is called seam mining, which is an important, increasing, and, so far as we are informed, a distinctive industry of the northern portion of this county. The most extensive, systematic and successful operations in this line have been in the Nagler and Peterson claim at Greenwood, the Whitesides claim and the Blasdel (formerly the Hart) claim near Georgetown. The Nagler claim has paid enormously and is reported to be now better than heretofore, but we have no exact or approximate information of the gross yield or net profits. The Whitesides claim is credited with a gross yield of \$30,000 last year, of which it is presumed that \$22,000 to \$25,000 was profit. The Blasdel claim has not been as thoroughly opened nor worked as long as either of the above named, but it is yielding at the rate of \$700 to \$800, at an expenditure not exceeding \$150 to \$200 per month. Through the courtesy and under the escort of Capt. E. W. Blasdel we were shown through the latter mine, and as a result of personal observation and of the information which his intelligence and practical experience enabled him to confer, we obtained a tolerable idea of this novelty in mineral development and mining. No two of these seam mines are alike, except in general characteristics, but a description of one will give some sort of an idea of the others. In all there are seams of decomposed or rotten quartz, imbedded in slate of similar consistency, and in all there are indications of violent upheaval. In the Blasdel claim there are several seams—perhaps a dozen or more—which, with the soft slate in which they are embedded, fill, at the surface, a space of sixty or seventy-five feet from east to west narrowing and coming together as they descend, enclosed by walls of harder slate. The course of the quartz seams and their slate casings is northeast and southwest. The position of the quartz seams and soft slate ledges varies from an almost vertical to an angle of twelve or fifteen degrees. The novelty of the mining consists in the fact that gold bearing quartz and slate casings are furnished, of such consistency that they can be readily quarried, pulverized and separated from their precious contents by hydraulic power and process. With a good "face" on a ledge, sectionally presented, more ground can be moved with the same amount of water and pressure than in the average of gravel hydraulic claims. It is but seldom, and then generally owing to the position of the strata, that powder has to be used to loosen a bank. In the Blasdel claim an opening two hundred and fifty feet long, and sixty feet deep and from fifteen to twenty-five feet wide has been made in a little over one season's washing. This claim is owned by Captain Blasdel, his brother the ex-Governor of Nevada and a Mr. Phillips of San José. They own a ditch which is about four miles long, with some other smaller ditches that catch waste water, and from these they lead the water through seventeen hundred feet of nine inch iron pipe to their claim. At a depth of about seventy feet all but two of the quartz seams in this claim have come together, and in a shaft sunk about thirty feet below the bottom of their cut they have decomposed quartz nearly ten feet in thickness, of the consistency of a tolerably compact sand bank, and this has yielded on assaying tests at the rate of \$18.75 and \$19.25 per ton. A tunnel three hundred feet in length will penetrate to the line one hundred and five feet below the bottom of the shaft, which project Governor Blasdel is contemplating, and when it is accomplished there seems every reason to believe that the net yield will be enormous. So mote it be!—*Placerville Democrat*.

A VALUABLE INVENTION.—Among the many labor-saving appliances for working mines, there is none more worthy of attention than the Dexter-Windlass. This machine, the invention of Mr. John A. Nelson, of Salt Lake Iron Works, has been tested by the most experienced miners of the Territory, and has given complete satisfaction. The windlass will hoist 500 lbs. from a perpendicular shaft at the rate of one foot per second, with the power of one man, and, when worked by two men, will raise from an incline one ton in the same time. The huckets and cars are lowered by a friction-brake, which ensures entire safety in its operation. The machines are now being manufactured at the Salt Lake Iron Works, in models to suit the sizes of shafts, and are made of the best materials and of superior finish. Mr. Nelson, the inventor, is foreman of the Iron Works machine shop, and has one of these windlasses in working order at their foundry.—*Utah Mining Journal*.

THE Philadelphia Ledger takes up the money side of the horse disease. There are about 9,000,000 horses in the United States, valued at \$666,000,000. If but one per cent. of these should be carried off, making 90,000 horses, it would entail a direct money loss of \$6,600,000; two per cent., or two deaths out of every hundred, would bring a loss of over \$13,000,000; and three per cent., which is the mortality in some cities, swells the loss to nearly \$20,000,000. This is in addition to the heavy loss of the daily earnings of the vast proportion of the horse that are disabled and cannot work.

MECHANICAL PROGRESS.

A New Process for Manufacturing Steel.

Some time ago we became cognizant of some experiments that were in progress aiming at the cheap and rapid production of steel from iron without the necessity of melting the iron. As this process has been perfected and a patent granted for it, we are now at liberty to give our information in regard to it, and we are free to say if the same results can be obtained on a large scale that we know, from actual sight, have been on a small scale the invention is not second to that of Bessemer.

The invention in brief consists of a process by which iron, by immersion in a molten bath for the space of from 15 minutes to one hour, becomes converted into steel.

In detail the process is as follows: By means of a magnetic coil or helix around a blast furnace or cupola, where Missouri ore (Iron Mountain, Shephard Mountain, or Pilot Knob) is smelted with coke, a dark product with slightly magnetic properties is obtained. This is spongy, light as to weight, and in melting boils up like molasses. This, when smelted in a crucible or open hearth, imparts to bar iron, heated or immersed therein, new pure iron, that permeates its structure, making it more dense, ductile and malleable.

A small per cent. of this dark product, when used in a common blacksmith's fire with coal, intensifies the heat—at the same time it acts as a flux upon the iron or steel that precludes its burning at a welding heat, so that Bessemer or other steels may be successfully welded without sand, clay, or borax—heated to semi-fluid therein. When Iron Mountain ore is melted in certain per cent. with pig or scrap metal, a dense, bright, clear sounding product (very hard) is obtained. A small per cent. of this melted with the dark product, adding a little lime and oxide of iron, forms a bath of solution that imparts to bar iron immersed or hoiled therein very fine steel properties. Such products work into the very finest cutlery, including plane bits and chisels, that will stand the hardest pine or oak knots. This product shows no steel properties until it is heated bright red and cooled off in water, when it assumes all the properties of fine steel. It may be successfully worked at a white heat without injury, or even welded in a blacksmith's fire without borax or any other protection from the air. A furnace is now being constructed in the West for the production of these new and valuable products of iron, with a view of bringing the matter practically before the iron and steel interests of this country. Missouri ore is named for the reason that any others have not been tried. We have specimens of these products in our office, and will be pleased to show them to parties who may call.—*American Manufacturer.*

WHAT IS STEEL?—Mr. A. L. Holly in his lecture before the Stevens Institute, says: "Before considering the process and machinery, let us define the term steel. Steel is an alloy of iron which is cast while in a fluid state into a malleable ingot. Any radical nomenclature founded on chemical differences leads to endless mistake and confusion. If steel is defined as an alloy of iron containing carbon enough to harden it when it is heated and plunged into water, then puddled iron, although laminated and heterogeneous in structure, may be steel, and the finest product of the crucible, although crystalline and homogeneous in structure, may not be steel. The fundamental and essential difference between steel and all other compounds of iron, is a structural difference, and it is always easily determined, while steel and wrought iron cannot always be distinguished by chemical analysis. The same proportions of carbon, manganese, silicon, and other elements, may exist in and similarly affect any malleable alloy of iron. Steel is, therefore, an alloy of iron which it casts into a malleable mass."

A PLATINUM COINAGE.—The idea of a platinum coinage continues to be a subject of discussion among the scientists of Europe. No other metal, not even gold or silver, possesses so many inherent qualities for such use. It would be proof against forgery on account of its high specific gravity; its scarcity gives it an intrinsic value, and its indestructible nature admirably fits it for enduring the wear of constant use. It has already been largely used for medals in France, and successful experiments have been made for converting it into coin. In Ruesia, it was actually used for coin previous to 1845, when it was demonetized by imperial ukase. That step was taken at the time because the ready methods of working and refining the metal were not well understood. That objection is now, however, fully removed.

ANOTHER MONSTER GUN.—It is stated that the authorities of the Royal Gun Factories, Woolwich, England, have designed and are prepared to construct a 70 ton gun, which shall throw a projectile of 1,400 pounds.

NEW CAR-WHEEL LUBRICATOR.—A gentleman in Pottsville, Pa., has received letters patent for a self-lubricating car-wheel, axle and trucks, which when properly adjusted, is said to lubricate without renewal for six to nine months.

Cleaning and Refacing Stone.

Mr. Ira Wadleigh, of Charlestown, Mass., has patented a mode of cleaning the faces of cut and other stone, which is described as follows:

For this purpose of cleaning granite, he takes about one pound of commercial oxalic acid to twelve quarts of cold water, and, by stirring, dissolves it thoroughly. He sometimes uses but three-quarters or one-half the quantity named of oxalic acid and sometimes puts the dry powder on the dampened stone, and adds water—this where there is any unusually tenuous spot. This will clean granite and marble; but for marble he prefers to use one-half pound of commercial chloride of lime dissolved in twelve quarts of water cold. Sometimes, on marble he alternates the application of chloride and oxalic acid. He rubs on both or either of these to the article treated, alternating with the rubbing on of cold water. For granite he also uses one pint commercial sulphuric acid mixed with twelve quarts cold water. This for the first application, letting this stay on the stone treated for three to five minutes. He then removes it by washing this object with cold water; then rubs on with a brush the solution of oxalic acid described, letting it stay three to five minutes, and washing off with cold water. This treatment is continued until the stone is clean.

Oxalates have been used in cleaning stone; but the proportions and manner of applying it heretofore have been quite different. It is necessary that the strength of the acid and the method of applying should be governed by the character, and condition of the stone to be cleaned.

A TRIUMPH OF MODERN ENGINEERING.—The great suspension bridge—built over the Niagara river at a height of nearly two hundred and sixty feet above the water, and supported by towers upon each bank, the centres of which are eight hundred feet apart—has proved one of the most satisfactory successes in modern engineering science. The question of its safety having a short time ago been agitated, a critical investigation of its actual condition was accordingly made by a company of engineers, and the effect of twenty years' wear and exposure has been accurately determined.

In the examination thus made, the caps on the towers covering the cables were removed, and the cables found to be as perfect in all respects as ever they were. But most interesting and important of all was the result which attended a thorough inspection of the anchorage of the cables. The masonry over one of them was removed for about twelve feet, or below where the wires are attached to the anchor chains. A portion of the cable is imbedded in water lime cement. For twenty years this has been so, yet on removing it and rubbing the point off the wires, the latter were found as bright and perfect as when placed there, the cement having preserved the wire and anchor chains intact.

IMPROVED CAR AXLES.—To prevent flaws in railway axles, a method of shaping them by rolling pressure, instead of hammering, has been devised by an engineer, the result being accomplished in two minutes instead of half an hour, as required by the ordinary plan—the axle being not only superior in quality but more uniform in size, and is produced more cheaply. The machine used for this purpose consists of three rollers, regulated so as gradually to press more closely together, thus reducing the bar, and extending its length to the required size. It is claimed that the benefit of this rolling process is to obviate flaws in axles which so frequently cause disasters on railways.

STEEL AND MAGNETISM.—From recent experiments made by Captain Treve at the Brest Foundry, France, it will appear that the effect of magnetism is to cause a condensation of the metal in casting steel, the grain becoming finer and closer. This mould, in which the steel was cast, was a large coil of stout wire through which the electric current from a dozen Bunsen couples was passed, during the whole period of cooling. But steel thus magnetised is found to be weaker than ordinary steel against tensile and crushing strains; and it is therefore suggested that means should be taken to protect caststeel from terrestrial magnetism, during cooling.

HOMOGENEOUS STEEL.—One of Seimen's furnaces for the manufacture of homogeneous steel has recently been put up by Singer, Nimick & Co., of Pittsburg, Pa. This is a bold innovation on the old way of making steel, but after a severe test it is found to be a grand success. About 6½ tons is the usual average of a single melt, and its capacity can be doubled at once, if needed. This steel is used almost exclusively in the manufacture of boiler plates, and every plate is tested before it leaves the works.

A SUBSTITUTE FOR BORAX.—M. Gauduin has been making experiments to supersede borax, which is generally employed in soldering, and the result is that he finds that an excellent flux for soldering iron, and brazing copper and aluminium hrouze, is obtained by a mixture of equal parts of cryolite and chloride of barium.

A NEW PROCESS FOR MAKING IRON AND STEEL is announced, the chief point of which is the forcing a jet of hot air against the molten metal as it runs in drops through a part of the furnace. The supply of air is regulated in accordance with the amount of oxidation required. To form steel, vapor of hydro-carbons is added.

SCIENTIFIC PROGRESS.

Living, a Science.

The mineral matter necessary for the nutriment of plants has been most carefully studied, and the amount and quality of the mineral ingredients absolutely indispensable to their well-being has been determined. Hence, agriculture is becoming more and more an exact science, and the soil like a machine, to which we can present raw material, confident of the yield and of its quality.

Such being the case, the question naturally arises in some minds, why cannot such mineral matter as is necessary for the maintenance of the human frame be supplied to it in a concentrated form? And may we not, by altering the proportions, so manage the composition of this mineral mixture, as to supply to the system of each, that which it lacks? Acting on this idea, a recent writer proposes a mixture, or "Zootropic powder," which is compounded as follows:

Calcic Hypophosphite.....	10.
Trisilicic Calcic Phosphate.....	10.
Sodic Phosphate.....	15.
Calcic Carbonate.....	20.
Magnesian Hypophosphite.....	15.
Sodium Chloride.....	10.
Potassic Bicarbonate.....	15.
Ferric Oxide.....	30.
Manganic Oxide.....	2.5
Potassic Silicate.....	2.5
	100.00

In making up the proportions for this powder, the author was obliged to determine the proportions of mineral matter in the human frame, when in sound health, only approximately. The inventor has tried the powder upon himself and his sons, but does not state whether the effects were such as he anticipated.

Theoretically and experimentally, plants may be made to live and produce by the aid of concentrated manures alone; as in clean sand or pounded glass, supplied only with such mineral manures and artificial solvents, as the various kinds of plants may require. But such are only hot-house experiments. If the same plants, under similar manurial conditions, were subjected to field culture, and all the varied accidents of climate, insects, fungi attacks, etc., the system would be found utterly impracticable. In order to secure that degree of health in plants that will enable them to successfully resist the casualties of broad culture, some bulky carrier must be employed in which to convey, at least, a part of their food. We find that it is absolutely necessary to mix stable manure, muck or something of that kind with their mineral food.

So with the human frame. It might, no doubt be kept together, and life sustained, by purely mineral food; but, as in the case of plants above noted, our bodies would lack elasticity and power of endurance. We should have no power to sustain ourselves in the stir and war of life. The assimilation of food would not keep up with the amount of force expended in exercise. There is an evident demand for bulk—waste—in the stomach. An opportunity must be given for the organs designed to carry off this waste to do their proper work. Without use they become unhealthy and spread disease all through the system. Nature in her wilds, provides an abundance of decaying matter to accompany the mineral food necessary for vegetable life. The Creator has so constructed the human system that bulk in food is one of the essentials for the human stomach.

When the earth is forced to yield beyond its natural powers of production, added stimulus, in the way of concentrated manures must be administered; just as such stimulus must be provided to enable the human system to bear up under unnatural effort, either physically or mentally. We may modify, but cannot utterly defy the laws of nature. Hence the true science of living is to keep as close to the dictates of nature as our artificial modes of life will admit.

FROST CRYSTALS.—The crystalline form, which the vapors of a room assume, while being condensed on the cold panes of a window depend mostly on the surface condition of the glass. A glass plate, absolutely clean and flat, would show no forms, the frost being equally distributed. The wiping or cleaning of the window inside the room is usually done in a roundish, spiral, or scroll like manner; hence the first adhesion of vapor, and the subsequent crystallization (if we can call it so) follows these lines and produces the well known fern-like or leaf-like forms. But wipe one pane before a frost carefully by horizontal streaks only, and the next to it by vertical streaks; and the frost crystals will be formed in the same directions respectively, much more resembling those of some chemical salts than vegetable shapes. Snow crystals forming in the air without any chemical or mechanical obstacles, are always hexagonal, with secondary formations of the same system.

VOLATILITY OF IRON.—Iron is volatile at very high temperatures, the same as gold and platinum. Dr. Elsner, Director of the Berlin porcelain factory, enclosed a small piece of wrought iron in an unglazed crucible and exposed it for several hours to a temperature of at least 3000° C. On removing the cover of the crucible, small needles of metallic iron were easily discerned, clearly showing that iron can be volatilized at high temperatures,

A New Method of Consuming Coal Smoke.

Mr. B. T. McCarty, of Cleveland, Ohio, has invented a new method of consuming coal smoke, which promises to admit of useful application. He was looking after means to secure a better draft for a sluggish fire, and an idea occurred to him, after other devices failed, to try the effects of steam. A small pipe was made to conduct the "dry steam" from the top of the boiler to the upper part of the furnace, where it entered in two small jets, striking downward on the burning fuel. No sooner was the steam injected into the furnace than the sluggish, smoky fire sprang up into a clear, bright yellowish and intensely hot flame, filling the whole furnace with a loud roar. The end sought—a strong draft—was attained, and, in addition, the long sought desideratum of a smokeless fire. This simple apparatus was next applied to the furnace of the Cleveland Herald printing establishment, and that journal gives an interesting account of the result. It says: "This smoke stack that had long been a nuisance to ourselves and our neighbors, was instantly as innocent of smoke as a deserted house, and so it has continued, save when the steam has been turned off for the sake of experiment and comparison." The proprietors of the Herald claim a saving of 25 per cent. in fuel when steam is admitted to this furnace.

A Novelty in Telegraphing.

Prof. Loomis, of Yale College has proposed something novel in the way of telegraphing. His plan is to telegraph from any given high peak to another at long distance, using an upper stratum of air as a means of electric communication instead of the ordinary wires. The plan as we understand it, is to erect upon such heights a tall tower or mast, the tops of which will be connected with an apparatus capable of generating a large amount of electricity which will be carried from point to point along this upper stratum of air. Ground connections will be used to complete the circuit as with wires. It is supposed that the slightest pulsation of the electricity of one tower will produce a similar pulsation at the other.

A bill is reported as having passed both Houses of Congress, giving some special privileges to a company organized to carry out this scheme, the object of which is described to be the development of the untutilized principles and powers of natural electricity, to be used in telegraphy, generating light, heat and motive power, and otherwise operating machinery run by electricity for any purpose. The name of Prof. Loomis as its originator is the only thing at first sight that attaches any importance to the scheme.

LIGHT.—According to the theory generally received at present, the whole universe is an immeasurable sea of highly attenuated matter, imperceptible to the senses, in which the heavenly bodies move with scarcely any impediment. This fluid, which is called ether, fills the whole of space—fills the intervals between the heavenly bodies, as well as the pores or interstices between the atoms of a substance. The smallest particles of this subtle matter are in constant vibratory motion; when this motion is communicated to the retina of the eye, it produces, if the impression upon the nerves be sufficiently strong, a sensation which we call light. Every substance, therefore, which sets the ether in powerful vibration, is luminous; strong vibrations are perceived as intense light and weak vibrations as faint light, but both of them proceed from the luminous object at the extraordinary speed of 186,000 miles in a second, and they necessarily diminish in strength and proportion as they spread themselves over a greater space. Light is not, therefore a separate substance.

OCCLUDED HYDROGEN NOT ALLOYED.—It has been a question whether hydrogen when absorbed or occluded by palladium does not enter into a true union with the metal so as to form an alloy. Recent experiments in England appear to show that no alloy is formed, neither can the union be considered as a mixture of a definite palladium hydride, with excess of palladium. The experimenters, Messrs. W. C. Roberts and C. K. A. Wright, are therefore inclined to believe that in palladium charged with hydrogen, each separate charge must be regarded as giving rise to a distinct compound, which cannot be expressed by simple formula.

A BEAUTIFUL FUNGUS.—A correspondent of the *Scientific American* recently sent that journal a stereoscopic view of a fungus, found growing upon an old anvil block in an unused blacksmith shop. It was of a pure white color, and about nine inches in extreme length, seven wide, and five high. The finder considering it a thing of beauty and of a perishable nature, concluded to have a photograph made of it. It had more the appearance of a piece of marble sculpture than of vegetable origin, and was much admired by all who saw it. It was pronounced Hydnum coralloides, one of the most beautiful of hymenomycetous fungi.

IMPROVEMENT IN PHOTOGRAPHY.—Some genius is reported to have discovered a process of introducing red rays through the front part of a camera, which is said to improve the half tints of photographs, and diminish the time of taking impressions nearly one-third.

OUR MINING SHAREHOLDERS' DIRECTORY.

ASSESSMENTS.

ASSESSMENTS.							
Name of Co.	Location.	Secretary.	S.F. Office.	Assmt.	Levied.	Delinq't.	Sale.
ADAMAL NELSON T. & M. Co. Co.	Uran.	H. S. Simon.	Room No. 11 Mt. St. B'k.		10 Jan. 27	Mar. 8	Mar. 31
Alp-S. M. Co.	Ely District.	C. S. Neal.	492 Montgomery St.		Feb. 13	Mar. 24	Apr. 15
Alma S. M. Co.	Ely District.	W. C. McLean.	492 Montgomery St.		Feb. 13	Mar. 24	Apr. 15
Anthony G. M. Co.	Placer Co., Cal.	W. I. Rip Jr.	41 1/2 Cal. St.		23 Jan. 29	Mar. 4	M. r. 20
Arizona & Utah.	Washoe.	J. Maguire.	416 California St.		1 00 Feb. 15	Mar. 21	Apr. 9
Arkansas M. Co.	Ely District.	C. A. Applegate.	729 Montgomery St.		30 Jan. 18	Feb. 26	Mar. 22
Arroyo G. M. Co.	Cal.	R. Wagner.	416 California St.		1 00 Jan. 18	Feb. 26	Mar. 22
Buckeye & S. S. M. Co.	Washoe.	J. Maguire.	419 California St.		1 00 Jan. 21	Feb. 25	Mar. 18
Caaveros G. M. Co.	Cal.	T. B. Wingard.	318 California St.		25 Feb. 12	Mar. 18	Apr. 8
Cedarburg & S. M. Co.	R. Washoe.	R. Wagner.	416 California St.		2 00 Jan. 18	Feb. 26	Mar. 22
Cedarburg First North Ex. Co.	Cal.	J. N. Web. ter.	505 Montgomery St.		10 Feb. 3	Mar. 11	Apr. 17
Cedarburg First South Ex. Co. Cal.	Cal.	J. N. Web. ter.	508 Montgomery St.		5 Dec. 27	Feb. 23	Mar. 20
Cobrooke Flat Blue Gravel M. Co.	Ely District.	H. Pichor.	413 Washington St.		1 00 Feb. 14	Mar. 10	Mar. 27
Columbia & S. M. Co.	Ely District.	C. A. Applegate.	402 Montgomery St.		1 00 Feb. 20	Mar. 10	Mar. 27
Chollar-Potosi M. Co.	W. Washoe.	H. B. Dean.	419 California St.		5 00 Feb. 13	Mar. 19	Apr. 7
Continents S. M. Co.	White Pine.	H. H. Kean.	302 Montgomery St.		1 50 F. h. 7	Mar. 15	Apr. 7
Covey & S. M. Co.	Nevada.	A. Spayne.	423 Cal. St.		25 Jan. 24	Feb. 28	M. r. 20
Danapur M. Co.	Butte Co., Cal.	C. C. McConner.	426 Montgomery St.		50 Jan. 18	Mar. 19	Mar. 24
EAGLE Q. S. M. Co.	Santa Barbara Co.	Wm. H. Watson.	302 Montgomery St.		60 Jan. 18	Mar. 19	Mar. 24
Empire M. Co.	Idaho.	C. F. salmon.	428 Montgomery St.		100 Jan. 6	Feb. 15	Mar. 8
Enterprise M. Co.	Washoe.	G. K. Whitely.	416 California St.		50 Jan. 24	Feb. 26	Mar. 22
Equitable T. & M. Co.	Utah.	C. S. Healy.	Merobans Exchange.		100 Feb. 22	Feb. 22	Mar. 10
Excelsior Gravel M. Co.	Idaho.	P. W. Van Winkle.	301 California St.		100 Jan. 7	Feb. 10	Mar. 10
Globe M. Co.	Washoe.	W. E. Dean.	419 California St.		100 Jan. 7	Feb. 10	Mar. 10
Gold & Silver M. Co.	Idaho.	K. K. Palmer.	Merobans Exchange.		1 50 Jan. 21	Feb. 26	Mar. 22
GOLD RUM M. Co.	Nevada Co., Cal.	C. C. Palmer.	Market and Spear Sts.		10 Dec. 30	Feb. 4	Feb. 25
Gould & Curry S. M. Co.	Washoe.	A. K. Durawor.	Merobans Ex.		1 00 Feb. 10	Mar. 17	Apr. 7
Granite Tunnel M. Co.	Idaho.	W. G. Holmes.	441 Cal. St.		6 Jan. 17	Feb. 24	Mar. 14
Gravel M. Co.	Ely District.	R. Wagner.	336 Montgomery St.		1 00 Jan. 18	Mar. 19	Mar. 24
Hayes G. & S. M. Co.	Nevada.	H. C. Howard.	323 Montgomery St.		1 00 Feb. 5	Mar. 18	Apr. 14
Hoppe Gravel M. Co.	Grass Valley.	L. Kaplan.	Merobans Exchange.		50 Jan. 17	Feb. 20	Mar. 10
Imperial S. M. Co.	Idaho.	C. S. Healy.	419 Cal. St.		2 50 Jan. 21	Feb. 26	Mar. 22
Imperial S. M. Co.	Washoe.	W. E. Dean.	419 Cal. St.		1 Jan. 23	Feb. 27	Mar. 21
IMPERIAL TRICE EUGENIE G. M. Co.	Cal.	Gustave Berson.	712 & 714 Washington St.		5 Feb. 15	Mar. 22	A. r. 22
Jackson M. Co.	Eureka District.	H. O. Kibbe.	419 Cal. St.		10 Jun. 21	Feb. 26	Mar. 22
Jacksonville M. Co.	Esmeralda Co., Cal.	A. K. Neal.	419 Cal. St.		10 Jan. 17	Feb. 26	Mar. 22
Justice M. Co.	Washoe.	R. Wessner.	414 California St.		1 50 Feb. 18	Mar. 25	Apr. 15
Kentuck M. Co.	Washoe.	F. Swift.	415 Montgomery St.		100 Feb. 8	Mar. 12	Apr. 10
Kentucky & S. M. Co.	Ely District.	J. P. Cavalier.	509 Cal. forma St.		1 00 Feb. 11	Mar. 15	Apr. 10
Kentucky & S. M. Co.	Ely District.	J. P. Cavalier.	509 Cal. forma St.		1 00 Feb. 11	Mar. 15	Apr. 10
LADY FRANKLIN & S. M. Co. Cal.	Cal.	J. S. Lely.	571 Montgomery St.		50 Feb. 18	Mar. 31	Apr. 21
La Paz M. Co.	Ely District.	B. E. Minor.	41 1/2 California St.		50 Jan. 20	Feb. 28	Mar. 24
LEMON M. & M. Co.	Ely District.	T. M. Kline.	608 Merchant St.		1 00 Feb. 12	Mar. 18	Apr. 8
Levi & S. M. Co.	Idaho.	T. M. Kline.	60				
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Levi & S. M. Co.	Idaho.	T. M. Kline.	60				
Levi & S. M. Co.	Idaho.	T. M. Kline.</					

[S. F. Stock and Exchange Board.]

The Stock Market this week has been pretty good considering the weather and the late depression. Still no very large amount of business is being done, nor are prices so high as to render people unable to buy if they want to. The variations in price do not amount to much for no general rise has occurred, or has any particular mine been in much better luck than its neighbors. The Washoe mines are attracting considerable attention. Belcher particular is in favor. During last month it milled 8,501 tons of ore, averaging \$51.46 per ton, or \$437,489. The Crown Point mine in January milled 16,000 tons, worth \$41.43 per ton or \$621,450. It is probable that the former will yield \$100,000 more this month. It is milling a quantity now equal to 9,000 tons per month, worth about \$60 per ton. The *Alta* makes the following remarks concerning the state of the market:

There is now a growing strength in the market, per-
hapse better founded than last year, since there are so
eral mines, both in Virginia and Gold Hill. It is
reported to have good bodies of ore about to be developed,
and in the hands of strong parties disposed to keep the
control, and preparations for a vigorous campaign have
been made. It is confidently stated sometimes
since that a large body had been discovered by
and Norcross and Chollar line, at some distance from the
shaft-working levels of the Chollar. That mine, after
seven years of ore production, has levied an assessment,
and has been sold to the Government. It is also men-
tioned that the Government has given a lease of the
lows, showing the product and output of each year
from the organization of the Company.

RAYMOND & ELY.—On the 7th inst. 24 bars of bullion worth \$39,634 were shipped. On the 15th, \$35,906 was shipped; previous to last shipment \$69,603 had been sent down, making a total of \$105,509 up to the 16th inst.

CROWN POINT.—The ore breasts on the 1,300-ft level still look well and are in ore of good quality and character. The mine looks well at all points.

BUCKEYE.—On the 11th inst. \$1,467 were sent down, the proceeds of 110 tons of ore; on the 18th a bar valued at \$1,593 was shipped, the result from 110 tons of ore.

AMERICAN FLAG.—On the 13th inst. \$18,819 was sent down; previous shipments, \$9,869; total, \$28,678.

MAMMOTH.—The Superintendent expects soon to strike a large body of rich ore judging from indications.

CHOLLAR-POTOSI. — During week ending 15th inst. 577 tons of ore were extracted, and 612 tons sent to mill. Average assay of ore mined \$32.40.

HALE & NORCROSS.—During week ending on the 15th, 724 tons of ore was extracted, 755 tons sent to mill, and 1,474 tons remain on the dumps.

SAVAGE.—The report for week ending the 16th shows that 423 tons of ore were extracted, assaying \$25.38 per ton; 323 tons were sent to mill and 320 tons are at the mine.

IDA ELLMORE.—A har valued at \$3,455 was sent down on the 14th from 30 tons of ore,

THE following is mostly condensed from journals published in the interior, in proximity to the mines mentioned:

PENNSYLVANIA.—*Alpine Chronicle*, Feb. 15.

This claim comprises 2,000 ft. Work was commenced on this mine in 1864; the upper tunnel is in 300 ft., and the lower is to the ledge—918 ft., from the latter a north drift of 70 ft., and a south drift of 150 ft. were made, the latter running on this ledge; in this tunnel is an air shaft, and 100 ft. from the mouth is a 30-ft. shaft; the distance from mouth of tunnel to cropping is 1,150 ft., and the perpendicular is 500; the ledge is from 3 to 8 ft. wide, running in granite, soft on the foot wall, with a gouge of fine clay; the other side is a hard and smooth granite wall. The ore assays from \$15 to \$500 per ton; \$43,000 have been expended upon this claim; it has been well managed, and the want of means to develop it caused the cessation of work. It is situated 2 miles southwest of Silver Mountain, and the lower tunnel is 1,500 ft. above the level of the town.

GEORGE WASHINGTON. — This claim has been sold to the Ogden Silver Mining Co. of Chicago. Work was commenced in 1862 and a 150 ft. tunnel driven on the ledge. In 1864 the lower tunnel was commenced and struck the ledge at a distance of 400 ft.; 270 ft. from the mouth of this tunnel a 50 shaft was sunk from

MEETINGS.					
Name of Club.	Location.	Secretary.	Office in S. F.	Meeting.	Date.
Albion Gravel M. Co.	Grass Valley.	D. W. Dyer.	Merchants' Ex.	Annual	Feb. 22.
Amer. Tunnel.	Ely District.	C. L. Dyer.	Club de la Presse.	Annual	Mar. 10.
Chapman M. & M. Co.		Frank Swift.	415 Montgomery St.	Annual	Mar. 17.
Daney G. & S. M. Co.	Washoe.	Geo. R. Spinney.	320 California St.	Annual	Mar. 24.
Golden Gate Gravel Co.	Idaho.	W. A. Kaprielian.	415 Montgomery St.	Annual	Apr. 7.
Gold Run M. Co.		O. C. Palmer.	Cor. Market & Spear Sts.	Special	Feb. 26.
Hudson G. M. Co.		J. L. King.	441 California St.	Annual	Mar. 5.
Indus G. & S. M. Co.	Washoe.	D. W. Dyer.	Merchants' Ex.	Annual	Mar. 12.
Lee G. & S. M. Co.		H. O. Howard.	832 Montgomery St.	Annual	Feb. 26.
O'Brien & S. W. Co.	Washoe.	C. L. Dyer.	Trustees.	Special	Feb. 26.
Pochan G. & S. M. Co.	Cal.	D. A. Briggs.	441 California St.	Annual	Mar. 12.
Union Gravel Co.	Washoe.	P. W. Adams.	321 California St.	Annual	Mar. 19.

LATEST DIVIDENDS—(Within Last Three Months.)

Name of Co.	Location.	Secretary.	Office in S. F.	Amount.	Payable.
Black Diamond Coal Co.	Californa	I. B. Cornwall	Cr. Harrison & Spear.	3 94	Nov. 11
Cederburg G. M. Co.	Califnia	D. M. Bokes	420 Montgomery St.	500	Feb. 11
Alameda Coal Co.	Calif.	F. B. Lorthan	401 Kearney St.	1 00	Feb. 11
Crown Pont& & S. M. Co.	Washoe	C. E. Elliott.	419 California St.	1 00	Feb. 11
Dave M. Co.		N. C. Fasset.	220 Bay St.	1 00	Jan. 11
Maple Leaf Bay Coal	Oregon	L. Pool.	Merchants Ex.	1 00	Feb. 11
Eureka G. M. Co.	Grass Valley	R. Wegner.		1 00	Feb. 11
Mahogany G. S. M. Co.	Idaho.	T. J. Owens.	402 Montgomery St.	1 50	Aug. 11
Meadow Valley	Ely District.	T. W. Colburn.	402 Montgomery St.	1 00	Nov. 11
Union & Bennett M. Co.	Nevada.	B. B. Minor.	411 1/2 Califia	1 50	Feb. 12
Fiecke S. M. Co.	Ely Dist. Nev.	C. E. Elliot.	419 California St.	1 00	Aug. 11
Providence		J. M. Haffington.	419 California St.	1 00	Nov. 11
Round & Ely M. Co.	Ely Dist. Nev.	A. Moulder.	419 California St.	5 00	Feb. 11

which a 150 ft. drift was made, and from this another drift was made towards the Frank ledge 70 ft.—half way to it. The upper tunnel is in the croppings and the lower is 100 ft. below this and 900 ft. above the level of the town of Silver Mountain. The ledge is from 1 to 3 ft. wide, the ore of which yielded, by Freiberg process, \$100 per ton; \$34,000 have been expended on this claim, but had management, and want of capital, caused suspension.

AMADOR COUNTY

HINKLEY.—*Amador Ledger*, Feb. 15: The lessees are industriously at work cleaning out the old shafts, and getting ready to take out rock. We hear that this mine is looking splendidly, and has every indication of paying rich.

BACON.—*Amador Dispatch*, Feb. 15: Work is being seriously interfered with on account of too much water in the shaft, and it is feared that operations will have to be suspended till spring, or until steam machinery can be put up.

CALAVERAS COUNTY.

LANCHA PLANA COAL DISCOVERY.—Calaveras *Chronicle*, Feb. 15: Messrs. Waddell and Murray, attracted by certain formations bearing a resemblance to coal, began prospecting, and as has been seen met with success. At the mouth of an old tunnel that had been run in former years, a black, clayey formation about 1 ft. in thickness, very soft, being easily cut with a shovel, was first discovered, which was traced the whole length of the tunnel, a distance of about 140 ft. Sinking a shaft at the end of the tunnel, at the depth of 4 or 5 ft., another seam was found somewhat thicker than the seam first discovered and of a harder nature. A little deeper and another seam was discovered, 2½ or 3 ft. in thickness, showing a good quality of coal. Still deeper 2 additional seams were revealed the last of which

has been penetrated but 2 or 3 ft. The lowest seams together are about 8 ft. in thickness. Thus at only a depth of 25 or 30 ft., 4 seams were discovered of considerable thickness, and each successive seam exhibiting a better quality of coal. This coal has been tested with the most satisfactory results. A great amount of land has been taken up, one company claiming over 700 acres.

RAILROAD FLAT DIST.—The new rich chimney in the 100 ft. south level of the Sanderson holds well as the level is being extended. The ore on this dump shows considerable free gold. The lower tunnel of the Herzer mine is developing one of the prettiest and largest fissures in the district.

WEST POINT DIST.—Two new chimneys have been discovered on an old mine near the Butcher ranch. This ore is from 1 to 3 ft. thick and will average near \$50 per ton. The Granite vein alluded to, week before last, is gigantic in proportions. A lot of unassorted ore taken from a space 12 ft. wide, across the vein, paid a fraction over \$9 per ton, no defining walls having been found. Masses of preulophurites, 2 and 3 ft. square, are found here and there in this vein, showing free gold.

HULL AND FISHER.—*Calaveras Citizen*, Feb. 15: This valuable claim, situated near the Sheep ranch, has indeed proven itself to be a model mine. The company have just completed sinking their shaft, which at present is down 130 ft.

Woods.—This claim, on the San Antonio Ridge, never gave better evidence of its richness than it does now.

SHEEP RANCH.—This fabulously rich quartz lead is still steadily yielding its precious ore. The mill at present is working on rock which

averages \$70 to the ton, and enough of the same sort in sight to last for years.

EL DORADO.

POCAHONTAS.—Placerville *Democrat*, Feb. 15: In this claim, at Logtown, a rich quartz development—good milling ore, 4 ft. in thickness—was struck on Thursday morning the 13th inst.

KERN COUNTY.

HOWE MILL.—Havilah *Miner*, Feb. 15: Another very healthy clean-up was made on last Saturday, \$700 being taken out of 30 tons of rock.

GOLD BRICKS.—Kernville minea forwarded to San Francisco last week gold bricks valued at some six or seven thousand dollars.

PROSPECTING.—As soon as the snow melts a prospecting party will start off to further explore the mountain fastnesses of Grizzly Bear Mountain. Additional gold-bearing ledges are supposed to be in the vicinity.

NAPA COUNTY.

OAKVILLE QUICKSILVER.—Napa *Reporter*, Feb. 18: This property has been purchased by the Napa Mining Co. of New York. We learn that the former Co. disbursed during the past 13 months something over \$80,000.

PACIFIC.—Napa *Register*, Feb. 18: We learn that splendid ore is now being taken from the main level. The rich vein lately found, is near the foot-wall of the lode ground, and seems to be dipping into the mountain. The ore resembles somewhat that taken from the lower incline, and has the appearance of being the most extensive and valuable of any yet found. There is being a drift run into it, which shows very fine for 30 ft., the distance already in, leaving heavy ore in the top and bottom, and both sides.

NEVADA COUNTY.

INDEPENDENT.—Grass Valley *Union*, Feb. 14: This mine is on a gravel range near the Town Talk; it has but lately started up, and its first run of ten days gives \$1,300 gross. There is a very large body of paying gravel within its bounds.

BARS OF GOLD.—Feb. 19: Yesterday, at Findlay's Bank, we saw 2 bricks of gold, from the Idaho, which were turned out of the mill after a run of six days. The bricks are valued at \$19,000, and the gold thereof was cleaned up from the amalgamators alone. The batteries were not touched in the clean-up. Battery cleanings and sulphurets will add much to the value.

A 12-days' run of the Eureka amalgamators cleaned up, gives stamp to the value of \$23,000. Only 10 stamps were run to produce this result.

PLACER COUNTY.

QUINN'S MILL.—Placer *Herald*, Feb. 15: About 2 years ago Stephen Quinn purchased the old water power quartz mill and ledge at the falls of lower Bear river ditch, near Gold Hill, and repaired the mill and opened the ledge. Since the water came this fall the mill has been kept to work and has paid up for the mill and mine, and the ledge is now paying from \$22 to \$28 per ton regularly.

SAN DIEGO COUNTY.

GOLDEN CHARIOT.—San Diego *Union*, Feb. 9: Richer rock is now being taken out of this mine than ever before, and the ledge is from 5 to 6 ft. in width. There are over 400 tons of rock lying on the dump which will yield an average of \$100 per ton. Arrangements are now being made by the company to crush its own rock.

OWENS.—The hoisting works have been put up. Several hundred tons of rock have been stored in the mine, awaiting hoisting.

KENTUCK.—Whitney's mill is at present engaged in crushing about 30 tons of ore from the mine, all of which will yield from \$100 to \$150 per ton.

HELVETIA.—The shaft is down 240 ft. The ledge at that depth is about 3 ft. in width, and contains ore yielding from \$25 to \$30 per ton.

TUOLUMNE COUNTY.

KINCAID FLAT.—Sonoma *Democrat*, Feb. 1: Washing in this claim commenced about a week ago. Everything works to a charm, and what is very pleasant to the stockholders is the occasional sight of a piece of gold, that animates the eyes of those fond of dividends and filthy lucre.

Nevada.

ELY DISTRICT.

ALPS.—Pioche *Record*, Feb. 9: Ores still being botled in undiminished quantities; one load of which is being hauled to the mill each day.

CUTTER OF THE HILL.—Now down with the main shaft 120 feet below the level of the Burk tunnel. The shipment of ore last month amounted to 120 tons, the greater portion of which was high grade ore. The bulion shipment of the Chief of the Hill, for the month of January, was \$9,063, of which nearly \$300 was gold.

CHIEF EAST EX.—Shaft below the 90-ft. level down 105 ft. Ledge about 2 ft.

CHIEFMAN.—Work was resumed on this mine on the first of the month. It is now confined to prospecting the 360-ft. and 424-ft. levels.

DEXTER.—This is the name given a new lode discovered during the week near the Excelsior. A breadth of ore is now shown between 3 1/2 and 4 ft., which assays from \$210 to \$400 to the ton. It was struck 63 ft. below the surface.

EXCELSIOR.—The main shaft is now 225 ft. deep. The winze to connect with the shaft is now 103 ft. deep. About 7 tons of first and 3 of second class ore are being hoisted daily. The ore is constantly increasing in richness and now yields \$150 to the ton.

HORN AND HUNT.—Ore has continued to be taken from the mine of this company at the rate of from 15 to 25 tons a day. In the back ledge, in the extreme east drift, the vein has widened to fully 5 ft., on the tunnel, and there the ore is fully as rich as in any other part of the ledge—that drift being 50 ft. further east than any other. In the extreme west drift the ledge is about 3 ft. wide, and the ore there is high grade.

MADON VALLEY.—But little ore has been hauled to the mills for some days, but the usual quantity has been brought to the surface.

PIONEER.—The usual quantity of ore is being taken out,

and it is of a richer character than that raised last month. The haulage yield of last month has been considerable above the average, and there is a large amount of high grade ore on hand.

PIONEER PHOENIX.—New shaft progressing finely. Now down 300 ft. Ground very favorable for sinking.

RAYMOND AND ELY.—Tremendous quantity of ore out, the dumps being full. But little hauling was done during the week, owing to the epizootic and impassable condition of the roads. Oxen have been engaged, and it is thought the usual amount of ore will be laid down at the mills.

SILVER PEAK.—Larger quantities of ore than usual have been brought to the surface during the week, and 90 per cent. of it is high grade ore. There are now over 50 tons on the dump, which the assayer's certificates show to be worth, on a fair average, \$150 a ton. The ore breast is the same as before reported—about ten inches wide.

SPRING MOUNTAIN TUNNEL.—The tunnel is now in 300 ft. Three veins have been cut, all of which are promising in appearance, and from present indications, a fourth will be reached in a few days. A shaft has been started outside and below the dump to cut the first or No. 1 ledge at a depth of 600 ft. on its dip. Its great breadth and richness, as proved by assays, make this one of the finest ledges prospectively, in the district.

THE STAR OF THE UNION.—This is a promising lode about half way between Pioche and Highland. An assay run just under the vein, and is now about 170 ft. down. The ore is a fine milling rock, assays running so far, from \$60 to \$172 to the ton, with good bodies presented.

SEMI-BITUMINOUS COAL.—Feb. 13: We have been shown, and witnessed the burning of, some excellent semi-bituminous coal, from the mines of the Wahsatch Co. about 30 miles east of here in Utah. It burns with clear, bright flame, leaving behind white ashes, free of "clinker." The deposit now being worked is 12 ft. in thickness. Preparations are now being made to deliver it in Pioche in large quantities, as soon as the roads become passable.

MAONETIC AND HEMATITE IRON ORES.—Specimens of these ores may be seen at the office of Mr. J. B. Deane, Main Valley street. The hematite assays \$24 in silver. Both are of the purest quality. They are from the iron mines in Iron Mountain district, 75 or 80 miles east of here, and on line with the Bullionville narrow-gauge railroad.

EUREKA DISTRICT.

PAUL JONES, COY HILL.—Eureka *Sentinel*, Feb. 16: An assay made of ore from this mine, a day or two since, gave the astounding result of \$4,200 in silver to the ton. The ore is all millable, containing a very trifling percentage of lead.

HUMBOLDT.

CENTRAL PACIFIC.—Silver *State*, Feb. 15: We learn that the mine is looking first-rate, and that there is now in sight, in the levels and stopes, an unlimited quantity of excellent milling ore.

SANTA CLARA.—A sample of ore from this mine, in Santa Clara district, assayed by David Van Luencup, this week, yielded \$3,350 per ton. The sample of ore assayed was taken from the ledge at a depth of 15 ft. from the surface.

RAILROAD DISTRICT.

COR. ELKO INDEPENDENT.—Feb. 15: The Empire City Mining Co. started up its furnace on the 4th inst., and is doing good work, smelting about 14 tons of ore per day and turning out 3 tons of bullion, assaying \$220 in silver.

The mines now worked are the Last Chance and Lone, belonging to the E. C. M. Co. The Woodcock Company is running a tunnel to its mine. The Tripoli is doing the same. A tunnel is being run to cut the Bob Hunter, which is a large deposit of vein matter, containing considerable copper ore, consisting of silicate, carbonate and black oxide. The tunnel now being run will strike the lode over 100 ft. deep, and will give a thorough prospect of the lode at the bottom. The Last Chance district is now being worked on the 200-ft. level. The ore coming therefrom is a galena of very high grade, assaying from \$50 to \$400 per ton. At this point the stope now being worked is 6 ft. wide. A shaft is now being sunk upon the lode in Hussey tunnel, and is now 40 ft. below the tunnel on what is called a pipe of ore. This ore is first-class; the body, however, is small, but the prospects are reaching a body below are good. The Elia and State of Maine tunnel and all the rest of the mines are lying idle for the winter.

RESE RIVER.

MONTZUMA MILL.—Reese River *Review*, Feb. 10: This 10-stamp mill, it is reported, will be started up some time next month by Messrs. E. P. Figg & Co., of Sacramento, who are now taking out fine ore from their own mines in the Montzuma (Woodland) mining district. The prospects in that long-neglected district are said to be very promising.

WHITE PINE.

RENEWED ACTIVITY.—White Pine *News*, Feb. 15: We are gratified to learn from most reliable sources that the mining interest on Treasure Hill are commencing to show renewed life. The Aurora and Eberhardt companies are constantly adding to their force of men; the tramway of the company is constantly at work, and the mill in operation. Beside this company other valuable properties are being put in shape to work. The merchants are doing better than for weeks past, and money is more plentiful. It is not an exaggeration to say that the mines, especially the Ward Beecher, are daily improving in appearance. There is a feeling of confidence in our future, in which we share, and when travel opens the old days of '70 will be again witnessed.

RICH ROCK.—We have been shown some rich rock from Cherry Creek district, situated about 60 miles from here. By the samples we are of opinion, that, if there is enough of it, we would gladly sell out our interest and invest at once. Our informant says there are some 20 men now in that section, who are prevented from work on account of heavy snows, etc.

WASHOE.

ALAMO.—Gold Hill *News*, Feb. 15: The erection of the new building over the main shaft is making good progress, also sinking of the shaft. The main north tunnel is still driving ahead, the rock in the face working well.

ARIZONA AND UTAH.—The main shaft is down 197 ft. The bottom being in soft working rock, with streaks of quartz and chert.

BEAUCHE.—Daily yield 400 tons. The 1,200-ft. level is turning out better and better. The drift to open the 1,400-ft. level is being driven ahead as fast as possible. The other ore levels of the mine are yielding finely as usual and the various drifts being pushed ahead in the most efficient manner. The main incline is down 69 ft. below the 1,200-ft. level.

BRECKENRIDGE.—North of the incline a fine body of ore is developed above the 4th station, 3 or 4 ft. in width, and assaying \$24 per ton on the average. Total bullion shipments for Jan., \$4,092.8.

CALEBONIA.—Work driving ahead as usual. The main south drift at the 400-ft. level is in 14 ft. with the face showing quartz and porphyry. We saw some very good ore taken from this mine 2 or 3 days ago, a piece of which assayed at the rate of \$114 to the ton.

CHOLLAN POROSI.—Daily yield 90 tons of ore, the assay value of which is \$42 per ton. The several prospecting drifts on the 750 and 950-ft. levels are still pushed with all the vigor possible.

CHOLLAN POROSI.—Could about 500 tons in the 1,100, 1,200 and 1,300-ft. levels. The last mentioned level continues to open out better and richer as further developed. The ore is being hauled out to the height of three floors and increases in richness and extent up to the Belcher line. A drift north is now being run to ascertain its extent in that direction. The 1,400-ft. station has been opened and a drift run south toward the ore body is being energetically prosecuted. The main incline is now down about 40 ft. below the 1,400-ft. station.

GOULD & CURRY.—Sinking the incline is making excellent progress, the rock in the bottom working well. The main east drift on the 1,500-ft. level is making slow yet steady progress, the flow of water from the face continuing quite strong, necessitating great caution in the advance of the work.

HATE AND NONCHANCE.—The ore breasts between the 5th and 9th stations are holding out and yielding finely, while those between the 9th and 10 stations continue to improve in both looks and quality. The main north drift at the 12th station (1,700-ft. level) to connect with the north winze from the level above and the north winze from the 1,500-ft. level to connect with the north drift of the 1,700 are making good headway.

JEWELL.—This mine is looking well, and improving. The south drift at the 400-ft. level is in fine looking quartz.

JULIA.—The face of the main east drift at the 800-ft. level is in a mixture of clay and quartz. The west drift at the 1,000-ft. level is in 39 ft.

KENTUCK.—Daily yield about forty tons, from the old levels, which are showing some improvement. Work is resumed in the cross-cut east at the 1,300 ft. level, which is now in 114 ft.

SAVAGE.—Sinking the incline is making good headway. The main north drift on the 1600-ft level to connect with the south drift on the same level from the Gould & Curry shaft is making good headway. The main south drift on the 1600-ft. level is still driven steadily ahead to connect with the winze from the level above.

VERMONT NEVADA.—Daily yield, 60 tons of good milling ore. Much trouble has been experienced during the week in obtaining a sufficient supply of wood to keep the mill running.

SILVER CLOUD.—The face of the stopes on the upper level and the stopes in the back as well as the old workings continue to yield a large quantity of high grade ore that assays very high in gold, the winze from this level is down 15 ft. in metal-bearing quartz. At the first station the face of the drift continues in ore that assays an average of \$95.41 per ton. In this, as in the upper part, on the percentage of gold over silver is about 5 to 1. Mining experts have examined this claim and made careful estimate of the ore in sight, which they compute at 2,500 to 3,000 tons.

SILVER HILL.—Main north drift in 453 ft. South drift in 424 ft. Sinking the shaft is resumed.

STUBB TUNNEL.—Total length 3,601 ft. The diamond drill is being used in shaft No. 1 with good effect.

SUCCESS.—Some excellent ore is being extracted from the main drift on the ledge in the new shaft, in the canon east of the mill.

VIRGINIA CON.—The rock in the bottom of the shaft continues to work finely and the sinking is making excellent progress. The main north drift from the Gould & Curry shaft on the 1167-ft. level, is still continued. Another hoisting engine and two additional reels have been ordered.

WOOLWILE.—At the 3d station the north drift is in 25 ft., carrying very fine ore across the entire face. The south drift is in 35 ft. the ore assaying very high in gold. At the 2d station the pay body is 3 ft. wide, and assays \$76.37 to the ton.

CONFIDENCE.—Virginia *Chronicle*, Feb. 15: In the drift which is being run from the 1300-ft. level of the Yellow Jacket to connect with the 1600-ft. level of the Imperial, it is generally believed that a body of ore has been struck that assays from \$28 to \$56 per ton. A connection between the drift running north through this mine from the 1300-ft. level of the jacket, and the drift running south on the 1600-ft. level of the Imperial, will soon be made.

ORFEL.—The drift which is being run east on the 1465-ft. level of this mine is in about 270 ft. from the new shaft and has been run through quartz for the last 70 or 80 ft. in which streaks of ore have been found that assay \$35 to \$40 per ton. Judging from appearances, the ore found here is that of a chimney.

OVERMAN.—The drift on the 1000-ft. level of this mine is being pushed ahead, 25 ft. having been made during the week. The general opinion of interested parties is that the ledge will be struck before the drifts run many ft. further.

YELLOW JACKET.—No ore taken from this mine at present. Prospecting is being carried on to the 1300-ft. level. They have lately commenced to open the 1400-ft. level. Repairs on the shaft not yet finished.

Idaho.

EMPEROR.—Owyhee *Avantache*, Feb. 8: We are creditably informed that an immense body of rich ore has just been struck in the north works, extending through the 1st, 2d and third levels. This good news has already given our miners and business men renewed confidence in our camp.

Montana.

CERRY CREEK MINES.

ENSELMAN.—Montanan, Feb. 6: The shaft is down 50 ft. and has about 25 tons of first-class ore on the dump. The crevice at this depth is fully 2 ft. and the ore materially increasing in silver. From 78 pounds of (we presume selected) rock worked in a band mortar, Mr. Enselman recently obtained 23 ounces of bullion assaying \$3 per ounce. A ton of such rock would yield in the same mode of \$15,000. We have received three specimens which are almost entirely coated with native leaf silver, which are indeed magnificent.

EDENHART.—They are now down to the depth of 83 ft. with a 2 ft. crevice, and have about 50 tons of first-class ore out.

Among the shipments of ore to Silver Star for reduction by the new process, were 500 pounds of top rock cullings. The product was 17 ounces of bullion worth \$3 per ounce. This, for third-rate ore, may be considered good. They now have about 2 tons of first-grade ore from the same lead which will not yield less than \$8.00 per ton.

HOMER.—They are beyond the 50 ft., with the vein maintaining a good 2 ft. in width and the quality of ore improving.

Utah.

HORN SILVER DISTRICT.—Cor. Salt Lake *Tribune*, Feb. 10: A recent discovery of rich copper mines is all the talk in this place. On the 14th ult., several parties formed a prospecting expedition and returned a few days ago with some very rich copper ore, and report large and numerous lodes. Assays range from 15 to 42 per cent. in copper, and as high as \$40 silver, which is well worth looking after in these "latter days." A second party will leave here in a few days to organize the district and commence developing the mines.

LITTLE COTTONWOOD.—Feb. 14: Although the snow is lying 12 ft. deep in the Little Cottonwood canon, work is being vigorously prosecuted and many of the principle mines in the Haverth, Last Chance, Montzuma and Savage, worked by the Utah Winsor Mining Co., the development is going steadily on and with increased promises of a splendid future. In the Savage a 4 ft vein of rich ore is found; which will readily yield 10 tons or more a day—one that smelts with the greatest ease. The veins in the Montzuma, Haverth and Last Chance though not quite so large produce very high grade ore, and there is little doubt but these mines will turn out the coming season at least 25 tons per day of ore carrying on an average of over 200 ounces of silver per ton, besides a fair percentage of lead. The ore will probably be smelted at the Saturn.

The Illinois tunnel is looking well and indications are not wanting to show that the great vein of the tunnel will soon reach the great mineral belt underlying the divide.

The Utah tunnel is said to have reached ore. **WEST MOUNTAIN DISTRICT.**—Cor. Salt Lake *Tribune*, Feb. 14: I am quite impressed with the promising appearance of many of the mines and things in general, particularly with the promises of both the Utah Silver Mining and the Winsor & Co. The Utah has 2 furnaces which are principally supplied with ores from the Portland and Red Warrior.

This latter lode contains a large deposit of galena ore, surpassed in quantity only by the Comstock, and but for the low grade of the ore in silver, it would be the most valuable mine in the district.

The Winsomac Company, organized in New Haven, have two furnaces. The Winsomac has, during the past year, netted its owners about \$500,000 in bullion, and has recently been sold for a good price to a German Co.

Trade-Marks.

"Any person or firm domiciled in the United States, and any corporation created by the authority of the United States, or of any State or Territory thereof, and any person, firm, or corporation resident of or located in any foreign country, which, by treaty or convention, affords similar privileges to citizens of the United States, and who are entitled to the exclusive use of any lawful trade mark, or who intend to adopt and use any trade mark for exclusive use within the United States, may obtain protection for such lawful trade-mark."

The foregoing is an exact copy from the Patent Laws of 1870. In accordance with the Patent Office rules established by authority of the law, a trade-mark may be patented for thirty years, and renewed for a term of thirty years.

A legal trade-mark, properly registered, becomes personal property that can be sold and assigned. The law says: "Any person or corporation who shall reproduce, counterfeit, copy or imitate any such recorded trade-mark, and affix the same to goods of substantially the same descriptive character, and the quality as those referred to in the registration, shall be liable to an action on the case for damages for such wrongful use of said trade-mark, at the suit of the owner thereof, in any court of competent jurisdiction in the United States, and the party aggrieved shall have his remedy according to the course of equity to enjoin the wrongful use of his trade-mark, and to recover compensation therefor."

The *American Newspaper Reporter* makes the following sensible remarks:

"Every person, or firm, doing business, no matter of what kind or nature, so long as it is honorable, should have a trade-mark. It serves as an advertisement, and the first mere nominal cost is a trifle. Yet in a year's business the same amount of circular advertising would cost hundreds of dollars. The trade-mark can be used in connection, which cannot be limited, as the law protects it. Americans, who excel in the manufacture of certain classes of goods, and place their goods in European markets, soon discover that they are not only in competition with the best makers of the same line of goods, but find that their trade-mark protects them from imitation and counterfeit. The trade-mark is called a shield of things. There are many people engaged in the same business, yet it would not be at all difficult to have an especial originality in their designs. Let manufacturers put a trade-mark upon all their productions, and let dealers do the same to all the wares they send out. It is a protection to the former, and of vast business benefit to the latter."

Designs for trade-marks are taken out by Dewey & Co. of this city, for \$45, including Government fees.

OHIO CONS. G. M. Co.—This Company whose works are located at West Point Calaveras Co., Cal. have just completed one of the largest and finest overshot wheels in the country for the purpose of pumping, sinking and running the hoisting works. The main working shaft is down to a depth of 97 feet, where the ledge has been struck—when the water came so rapidly as to compel the erection of the hoisting works which has the capacity of going down 500 feet deeper than the shaft now is, as also of attaching and running five stamps in connection therewith.

This entire district of West Point is improving rapidly. The mines now being worked producing ore \$25 to \$100 per ton by mill working process. We are told that the future prospects of the Ohio are very promising, and that under the management of its present able superintendent we will soon have further favorable reports.

THE PHOENIX MINE CREDITORS.—At a meeting of the creditors of the Phoenix Silver Mining Company held at Eureka, Nev., on the 13th inst., J. M. Robertson, Agent of the Board of Trustees, proposed to pay one-third of all demands immediately in cash, one-third in ninety days and the remainder in six months from the date of signing the agreement with the creditors. The Company is giving good notes for the amount due, with interest of one per cent. per month. Mr. Goldstone moved that Mr. Robertson be requested to ask the trustees if they will place the property of the company in the hands of a committee in trust for the creditors to secure payment of the notes free of all incumbrance. The motion was adopted and the meeting adjourned. The whole amount of indebtedness is about \$52,000. An adjourned meeting was held on the 18th, and the creditors concluded to accept the terms first offered by the agents of the Board, viz: One-third cash, one-third in ninety days and the remainder in six months, taking the company's note as evidence of remaining indebtedness.

RICH STRIKES NEAR WHITE PINE.—In our neighboring district of Robinson, strikes of rich ore have been made frequently the past few weeks. Quite an excitement exists in the camp six miles southeast of Mineral City. It is believed by those well posted on country formation and ores, that there will be a big rush there in the spring months, as every indication shows that permanent ledges of rich mineral exist in that locality, requiring only a small outlay of capital for development. The town of Mineral City itself shows lively signs of improvement, building going on rapidly, and substantial improvements of every kind now in course of construction. As this District has come up entirely on its merits, we predict it to be one of the most prosperous places in our country during the coming season. —*White Pine News*.

Resources of Utah—Some of the Principal Mines.

We continue these articles from the Salt Lake Tribune. The Emma mine is situated in Little Cottonwood Cañon formerly a portion of the "Mountain Lake" Mining District. It was the first fully developed mine in the Territory. The results obtained in its development gave the impetus to mining generally. This mine stands at the head of the list for quantity of ore taken out and work done upon it. The first great discovery was made in 1869 when the prospectors at the depth of 127 feet struck a lode of mineral of vast extent, which afterward yielded a profit of \$120 per ton on shipments of the ore to Swansea in Wales. In the winter of 1869-70 a half interest in this mine was offered and could have been purchased from the discoverers for less than \$3,000. In the month of May, 1870, the firm of Walker Brothers, of Salt Lake City, purchased a one-sixth interest for \$30,000. In the summer of 1871 a half interest in the mine was sold to New York capitalists for \$750,000. In the winter of 1871-2 the Emma Silver Mining Company of Utah, was incorporated, stocked and placed upon the London market at £1,000,000 sterling. Fifty thousand shares of £20 each were issued, twenty-five thousand of them were immediately taken up, and the remaining twenty-five thousand were retained by the vendors of the mine.

The Direction and management is represented as follows:

Chairman, George Anderson, Esq., M. P.
Vice-Chairman, E. D. Williams, Esq., M. P.
Resident General Manager, Warren Hussey, Esq.
Superintendent, Silas Williams, Esq.
Secretary in London, W. H. Tooke, Esq.

The quantity of ore taken out of the mine during the year 1872, was 10,500 tons and the average value was about \$100 per ton, making a total value of \$1,050,000. The proportion of silver was 100 ounces to the ton of ore and 45 per cent. of lead. The average daily quantity of ore when working is about sixty tons, but 100 tons can be got out when the mine is worked to full capacity. Connected with the mine is a steam hoisting engine, the capacity of which is 150 tons per day.

Dividends have been declared and paid monthly at the rate of one and one-half per cent. on the capital stock.

In the spring of 1872 the mine was flooded with water—an experience quite new in the history of the mine, and which caught the company unprepared for such a disaster. Two large "Kuowes" steam pumps have been since erected and they are of sufficient capacity to keep the mine dry, should such another casualty occur.

Some considerable new developments have been made during the past year. Shafts have been sunk below the previous lowest workings, which have developed a large vein of ore, very rich in silver, a specimen of which weighing 100 pounds, averaged by assay 1123-87-100 ounces in silver to the ton.

The arrangements for working this winter are very complete. The out buildings are of a very substantial character. A new and commodious ore-house has been constructed, also a tramway for conveying waste matter from the mine. The new timbering in the mine is a first-class piece of workmanship and exceedingly strong.

THE FLAGSTAFF MINE,

Of Little Cottonwood Cañon, is owned by an English company, and was incorporated in London in November, 1871, with a capital of £300,000. The property includes the Flagstaff Mine, Maxwell Tunnel and extensive furnaces.

The mine at the time Mr. Maxwell reported on it for the directors, had in reserve 6,000 tons of ore blocked out by shafts, adits and winzes. The work of development has been steadily increasing, and at the present time shows the reserve of ore to be 26,000 tons, which result has been arrived at after a careful examination by Mr. Maxwell and Capt. Goldsworthy, the foreman at the mine.

During the year 1872 the mine yielded about 10,000 tons of ore.

Eighty tons is being raised daily, which can be increased to 100 tons without overworking or injuring the mine. The ore is sent down from the tunnel to the ore house on an incline in summer, and in stone boats in winter, the latter working much the best, and carrying down twice the quantity of ore in half the time. The mine is under the management of Captain Goldsworthy, who has had eighteen years experience in silver lead mines in England, and is fully capable of managing all the underground workings of this extensive property.

The furnaces, which are situated at the mouth of the cañon, are three in number, one hot and two cold blast furnaces, and are capable of smelting 75 tons of ore daily, which makes 25 tons of bullion, valued at \$340 per ton, \$55 of which is gold.

The assay value of ore is:
70 oz. silver, 50 per cent. lead, $\frac{3}{4}$ oz. gold.
100 " " " " " "

The hot blast furnace, the only one in the Territory, works very successfully, saving greatly in charcoal, and losing no lead. The furnaces are run by water power, the company

having the full water privilege of the Cottonwood Creek.

The furnaces are under the able management of L. M. Wessels.

This company is being very successfully worked and pays largely to its shareholders, and from present indications will continue for years to come.

Dividends 30 per cent. per annum, or 2½ per cent. per month are paid, £69,000 having already been paid in dividends.

The whole is under the superintendence of Mr. N. M. Maxwell.

THE WINSON UTAH SILVER MINES,

Of Little Cottonwood District, comprising the Last Chance, Hiawatha, Montezuma, and Savage lodes were consolidated September 12, 1872, and are owned and controlled by parties in Utah, Michigan and New York. Since this property was consolidated the owners have marketed about 500 tons of ore at an average selling value of \$60 per ton. This property is now being vigorously worked on ore. The veins in the bottom of the Last Chance and Savage lodes are yielding fine ore assaying from \$160 to \$307 per ton, and carry from 34 to 60 per cent. of lead. The present depth of the Last Chanceshaft is 366 feet; depth of the Montezuma shaft 375 feet; length of tunnels on the property 550 feet; depth of Savage and Hiawatha shaft 350 feet. The company have erected a fine hoarding-house, ore house and other buildings necessary to economically handle their property during winter, and have connected the various outlets to their mines by cross tracks to the main tramway, and are prepared to mine and ship ore to good advantage during the present winter. The amount of ore now in sight in the Montezuma mine carries a face three feet wide the entire length of the

shaft. The Last Chance vein is eighteen inches thick. The winzes in the Savage and the Savage Discovery shaft have a fine body of ore averaging from 7 to 31 inches in thickness. The Hiawatha incline has a good show of mineral its entire length. This property will compare favorably with any property on Emma Hill either for quantity or quality of its ore at the same depth and outlay for work done. The

whole is under the superintendence of Mr. J. C. Winslow.

THE MILLER MINE.

This mine is located near the head of American Fork Cañon, on what is known as the Middle Mountain. The lode occurs at the point of contact of the limestone and quartzite. The ore is mostly carbonate of lead, carrying silver and gold, and is a very free smelting ore. The mine at the present time is being prospectively worked with a view to next season's work. This mine is owned by the Miller Mining and Smelting company of New York. Francis Skiddy, president; Gen. Lloyd Aspinwall, chairman of Executive committee; E. Wilkes, general manager.

The Miller ore is smelted at the Siltana Furnace, two and one-half miles distant, situated in American Fork Cañon.

These works consist of three shaft furnaces of a capacity of seventy tons of ore per day.

The works are complete in every respect. The blowing arrangements consist of a No. 10 Striteant Blower driven by a 25-horse power. The charcoal is burnt on the ground; the company have fifteen kilns for the purpose; these are connected with the furnaces by a tram road delivering the coal immediately at the furnace mouth.

To this point it is intended to run the American Fork railroad. The grading is now completed.

THE MONO MINE,

Located on Dry Cañon, Ophir District, is owned by Messrs. Gibborn, Embody & Heaton. The extraordinary richness of some of its ores has already been referred to. A description of the mine may be of some interest. The incline shaft is down 308 feet. Starting from a point 40 feet from the bottom of incline, there are five drifts run on the left and three on the right of the main shaft. The vein of ore which has the appearance of a true fissure vein, averages about two feet; about three inches of it are said to be horn-silver and black sulphurets.

The vein runs nearly east and west and pitches to the north at an angle of twenty-eight degrees. There is a fine large ore-house, also a dwelling house, office and blacksmith-shop. The owners confidently believe they have as good a mining property as any in the Territory.

THE PRINCE OF WALES AND ANTELOPE MINE, Situated in Silver Fork, Big Cottonwood Cañon, is remarkable for its well-defined vein of ore which can be traced on the surface for a distance of five hundred feet. The average assay value exceeds \$150 per ton. The mine has been worked more than two years, and a large amount of labor performed on it, including 863 feet of tunneling, shafting and drifting, the course of the vein being followed the whole distance.

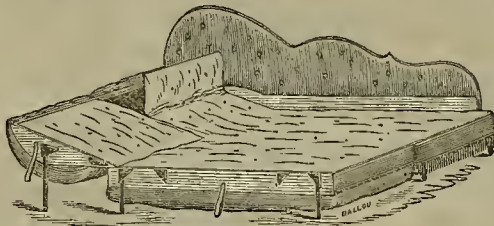
THE TIGER GROUP OF MINES,

Situated on Lion Hill, Ophir District. This group includes the Tiger, Silver Chief, Zella and Rockwell. These mines were discovered in the fall of 1870. They are all being vigorously worked. The lowest workings are to the depth of 250 feet. The extent of tunneling and shafting done in these mines exceeds any other in the Territory, it aggregating 2,580 feet. Between three and four thousand tons of ore have been taken out of the mines, the average value being about \$125 per ton. Some specimens have assayed as high as \$1,000 per ton.

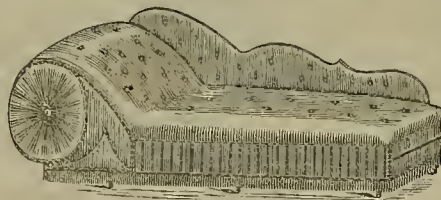
The names of the following mines have been furnished since the description of the districts was in type:

AMERICAN FORK DISTRICT.

The Waterloo lode, discovered the same day as the Miller. It is in the same cañon, and directly opposite the Miller. A shaft sixty feet deep has been sunk, disclosing a vein of



BED-LOUNGE OPEN.



BED-LOUNGE SHUT.

high grade ore. The Walker lode has also a shaft ninety feet deep, and has a quantity of fine ore on the dump. Other mines of equal merit may be mentioned, among them are the Chelsea, the Champion and Emeline, all promising and well defined lodes.

LYON HILL, OPHIR DISTRICT.

The Monarch and the Virginia series, em-

bracing the Virginia, Lizzie, M. C. Raymond, State of Maine, Dudley Gray, Julia, Bay State and others. The character of ores is strictly milling. The silver is in the form of chlorides and sulphides—the former predominating. Assays of the ore run from \$40 to as high as \$1,000 to the ton.

CAMP FLOYD DISTRICT.

The Camp Douglas Consolidated has a shaft forty-seven feet in depth and two open cuts. The Star of the West, owned and worked by a New York company, is developed by several open cuts and shafts. The Stafford is a well defined vein. It is being worked by open cuts and a tunnel sixty feet in length. The Carrie Steele adjoins this mine and is promising well. The Silver Circle, Wandering Boy, Legal Tender, Comstock, Silver Star, America, Excelsior, and Lone Star are all considerably developed and promise well. The General Morrow has a shaft fifty-five feet deep and is very promising. The Antelope has a shaft seven by seven and twelve feet deep, also an open cut six feet wide and ten feet deep. The ore is of good quality from all these mines and assays high.

PROSPECTING WITH DRILLS.—They are beginning to prospect for ore with the Diamond Drill at Washoe, on the same plan as which artesian wells are bored. The Gold Hill News says that General Williams and Mr. Shultz, of the Bullion mine, have already sunk a miniature shaft 400 feet deep with a two-inch diamond drill. They are working on some level ground, half a mile distant from the Ophir works. If this plan meets with success, it will doubtless be tried in other localities. As the plan was tried of drilling in this manner laterally to find the size and character of the great ore-body in one of the Washoe mines, some time since, and answered well, we see no reason why the method spoken of will not accomplish like results.

Pratt's Improved Bed-Lounge.

Bed-lounges are always convenient in small houses, either in the country or city, and, in fact, sometimes are found quite handy, even in large buildings. In case of an extra visitor, some of the family can give up their rooms and sleep on the lounge, or children can be put there in the nurses' room. The two cuts shown on this page give an idea of an improvement in this direction, which is now being introduced on this Coast, and which has been in use extensively in the East, especially in large cities where rents are high. The lounge is upholstered the same as ordinary lounges, and, when folded, there is no perceptible difference. The circular part of the head is made hollow, to form a receptacle for the bed-clothes; but when thrown upon the head-piece has a suitable inclination for comfortable sleeping. There are springs throughout the bed, covered with heavy canvas, and the bed is wide enough for two persons to sleep comfortably.

When used as a lounge, the legs can be folded in, out of sight, and it then presents the appearance of an ordinary lounge. Settees or sofas are constructed on the same principle as the lounge, and made in such a manner that the casual observer would not notice that they served a double purpose. These articles of household furniture, combining as they do, both the useful and ornamental, are durable and well made. Wiester & Co., No. 17 New Montgomery street, have the patent-right of the Pacific Coast for sale, and parties desiring further information can call on them and get particulars.

Winter in the Mines.

The Deer Lodge Independent has the following very excellent suggestions which might well be adopted in other mining localities:

The nature of our climate prevents successful surface mining in the winter season. Usually all surface mining is suspended before Christmas and is not resumed until some time in the month of April following. This gives miners a convenient time for rest and recreation. Some go East to visit the "old folks at home," others remain and employ part of their time in preparing for the summer campaign, by the construction of sluices, flumes, hydraulic telegraphs, sawing blocks for sluice and flume rifles, cutting ditches, digging drains, prospecting, etc. In fact none need be idle or unprofitably employed. If a number of miners have leisure during the winter months and do not wish to engage in manual labor of the kind mentioned, the season of rest affords a splendid opportunity for intellectual culture and social intercourse, and those who supply themselves with books, papers, periodicals, etc., may find a winter spent in a mountain mining town one of the most profitable and pleasant of any in the whole course of a lifetime. There is a pleasure derived from a self-consciousness of having made good use of the passing moments, in an earnest effort of self improvement, and every step taken in this direction is an acquisition of wealth, more enduring than the glittering nuggets we accumulate during the mining season. In order therefore to extend such advantages to as wide a circle as possible we would suggest the establishment of local libraries in the mining towns, which may be done at small expense. Books weighing four pounds may be ordered through the Post-office at a cost of only 32 cents postage. There is therefore no excuse for any individual to be wanting good books or late publications, as the U. S. mails deliver them at rates as low as merchants pay on groceries received by the slow mode of "narrow gauge" or teams. Our deep diggings, such as the drifting ground of Bear, Lincoln, Gold Cañon, French, Pioneer, Upper Ophir, Maginnis and other places afford constant employment, but the great majority of placers are worked from the surface, and many men have leisure to engage in reading, study, etc., which would in the end prove to them a saving of money, and add to the individual and general happiness and contentment of all.

COAL.—An English paper, speaking of the large amount of coal imported from the United States into the United Kingdom, thinks it probable that eventually a system of iron steam colliers of large tonnage will carry United States coal to all parts of the world. Some vessels now loading for the export trade have a capacity of 4,000 tons.

WHERE THE IRON GOES.—If the total length of railroads in all countries is 146,243 miles, as has been computed, it is not surprising that their maintenance, together with new construction, takes more than half the iron production of the world. Europe has 48 per cent. and America 47 per cent. of the whole.

A NOVEL BUTTON.—It is said that a Massachusetts woman has just patented a self-fastening button, which needs no button hole, holds fast, and yet unbuttons at a touch.

USEFUL INFORMATION.

CURIOSITIES OF THE BOSTON RUINS.—Although it is more than two months since the great fire, the rains and snows of winter have not succeeded in entirely quenching it. In many parts of the burnt district dense columns of smoke are still ascending, and bright flames dart out from beneath piles of brick and granite. The influence of heat upon various kinds of merchandise found among the ruins has afforded examples of metamorphosis interesting and curious in a high degree. Huge piles of leather in some cases were precipitated into cellars, and so covered with debris as to undergo a kind of dry distillation, or fusing out of contact with air. The resultant mass resembles a dry gum, with a clean vitreous fracture, upon the surfaces of which are seen the lines between the hides, like thin strata in a mass of silt. We have a lump of coke, produced from clover seed, which closely resembles cannel coal. It came from a mass of two thousand bushels which tumbled into a cellar, and was subjected to dry distillation under the bricks and mortar. Many other substances have undergone curious changes, and we may allude to some of them at a future time.—*Boston Journal of Chemistry.*

DURABILITY OF WOOD.—We expect wooden buildings to decay, and if they endure for a century or two they are regarded as venerable specimens of antiquity. The First Baptist meeting-house in Providence, R. I., a fine architectural model is said to be as sound, even to the top of its lofty spire, as when first built, though nearly a century old. But this is a young infant compared with some European churches. The trusses of the old part of the roof of the Basilica of St. Peter's at Rome, were framed in 816, but when carefully examined in 1814 were found to be perfectly sound and good. They were made of fir, and have lasted over a thousand years. The domes of the church of St. Marks, at Venice, were built nearly eight hundred and fifty years ago, and the outside timbers are yet good. Brick and stone could hardly last better than such wood-work.

Timber cased in plaster and in iron, however, has developed a very dangerous kind of dry rot.

HOW TO CLEAN PAINT.—A chemical journal gives the following advice: Use but little water at a time; keep it warm and clean by changing often. A flannel cloth is better than cotton. Be careful of soap. Put but a little soap or skin-milk in the water; add soap to the cloth when needed. A sharp piece of soft wood is indispensable for the corners; the point will become like a paint brush. A saucer of sifted ashes, used where paint is badly smoked or fly-specked are thick, is better than soap; wipe last with clean wet towel, and don't spill a drop of water. Never put soap on glass unless it can be well rinsed, which can never be the case with windows; wash off dirt in clean warm water and dry; then, with a paste of whiting and water, and with a little cloth, place a little in the centre of each pane. With another cloth rinse over the glass; next rub off with a dry cloth till the window shines like crystal.

MANUFACTURE OF MAD STONES.—A Virginia paper says there is a man in that State who is engaged in the manufacture of mad stones for the cure of hydrophobia. The original mad-stones were brought from France and Italy, and have the appearance and the weight of the more porous kind of bone. The domestic manufacturer gets the bone itself, and saturates it with some chemical or other, and sells small bits of it at \$5 each. Besides its virtue as a relief for hydrophobia, the bone is said to cure tetanus. "The cases of lock jaw," says the Virginia Editor, "are too few to make this discovery important. Can't some one invent a cure for *limber jaws*? They cost the State a great deal."

TO COPY MANUSCRIPTS.—Press copies of old letters or manuscript can be taken by pressing the pages on the damp paper in the usual way, and then applying the vapor of ammonia. Although no result may appear to follow the first operation, we are assured that after the second, the letters will appear distinctly on the dampened blotting paper. Another method consists in dampening the manuscript with a solution of sugar, honey, or mucilaginous matter, and then applying applying the dampened paper as heretofore. In this case the sugar is applied to the paper instead of being mixed previously in the ink, as is done in one form or other with ordinary copying ink.

HARNES DRESSING.—Long continued observations show that harness and other leather, exposed to the action of ammonia continually given off in stables, become weak and rotten sooner than other leather. Even when care is taken to protect it with grease, this takes place. Professor Artns recommends the addition of a small quantity of glycerine to the oil or fat employed in greasing such kind of leather, ascertaining that it keeps it always pliable and soft.

CARBON-PAPER.—The "carbon-paper" used for tracing and in manifold writing, is made by filling the pores of soft unsized paper with lamp-black. Oil—castor-oil or lard—is mixed with the black, and as much is rubbed into the paper as it will hold, and all that is superfluous is wiped off with soft cloths.

PALM WINE.—The sap of the palm tree runs quite freely from an incision through the bark. It is put into skin bottles, or rather bags, by African wine-makers in which it undergoes a slight degree of fermentation, and is soon ready for use. Every time the mouth of the bag is untied for taking a drink, it foams and sputters very much like spruce beer. Although all the gas may escape, shortly after being tied up again there is another volume ready to fizzle as before.

Christian travelers are quite as fond of palm wine as natives. Without being much of a stimulant, it has a relish that meets the demands of the system in a hot climate far better than any other drink. Of course it is in universal demand, and costs nothing but the labor of gathering the sap from the nearest tree, without asking leave.—*Southern Homestead.*

REMOVING PAINT FROM WINDOWS.—Inexperienced painters, when painting window casings and sashes, frequently spatter paint in minute dots over the surface of many of the panes, where it is left until it becomes dry and hard. Neat workmen always have a clean cloth or sponge, which is dipped in a little spirits of turpentine, and the paint is rubbed off before it is dried. After the paint has become dry and hard, strong soap-suds will not remove it without a vast deal of hard rubbing. The most economical way to remove dry paint from the panes is to make a small swab, having a handle some eight inches long, dip it in a little diluted oxalic acid, and rub off the paint with the swab.

THE BABYLONIAN WILLOWS.—The *Journal of Horticulture* says: "The willow which grew 'by the waters of Babylon,' whereon the mournful children of Judah hung up their harps, was not, as Linnæus and others have supposed, the *Salix Babylonica*. It is now thought to be a kind of poplar. The ordinary weeping willow has been brought from China and Japan."

In this connection we may remark that the *Gardener's Monthly* points out the absurdity of the supposed origin of Pope's Willow at Twickenham, which was said to have come from an old hamper basket which was found along the Thames, and had come from the Mediterranean. Any one ought to know that no basket ever was made of the weeping willow.

TRELLIS COLUMNS.—Telegraph posts and columns are manufactured in Manchester of spirals of iron-ribbands, in fact, supported on a cast-iron base, and surmounted with a capital of the same material. A slender rod forms the axis of the column, or, as it really is, a trellis-work tube. Compared with cast-iron columns, these structures are little more than one-third either in weight or cost, while in appearance the gain is decidedly great. For conservatories or other horticultural purposes the trellis column is very suitable. Such a pillar, eleven feet high and eight inches in diameter, is guaranteed to support a vertical pressure of one ton.

AMERICAN IMPLEMENTS IN ENGLAND.—It is an interesting fact that Philadelphia is now shipping saws to England. Shoemakertown, on the outskirts of Montgomery county, and a few miles from Philadelphia, also sends hay-forks, dung forks, and pitch-forks to Sheffield, England, the very centre of her iron and steel manufactory, while Ames shovels from Massachusetts supply England and the rest of the world. American ingenuity has so improved the quality and cheapened the cost of these implements that the tide is turned—we send to England instead of getting them from there.

KILLING KNOTS.—Glue size and red lead Gum shellac dissolved in alcohol, and mixed with red lead. Gutta percha dissolved in ether. But through all or any of these will the pitch of the knot exude if exposed to the sun. Perhaps the very best method is, to size the knot with oil size, and then lay a leaf of gold or silver on it. In a very choice piece of work, a hot iron may be held over the knot till a good portion of the pitch has come out and been scraped off, when the two coats of the leaf will be sure to keep out both the pitch and any discoloration.

INDELIBLE INK.—The French Government, it is reported, has just purchased the secret of the composition of an absolutely indelible ink—which resists the action of every known chemical agent. This ink will accordingly not only be used on all stamped paper in the postal service and the revenue service, but in the recording of all acts of the Assembly; it will also be sold with stamps in all the small shops.

SWEET FERN FOR TANNING.—Thousands of acres of land in Michigan are covered with a growth of sweet fern, which has hitherto been supposed to be worthless, but it has been found that for tanning purposes it is unequaled, and that it yields forty per cent extract, while hemlock yields but fourteen. It promises to be very valuable.

ARTIFICIAL LEATHER is made in accordance with an English patent by a mixture of one part of glycerine to three of glue. If flexibility is desired, hoiled linseed oil is added, if elasticity, a solution of caoutchouc. The mass is placed on a fabric and pressed, then washed with a solution of chrome alum.

TO PREVENT EBULLITION.—In order to prevent ebullition of boiling liquids a small fragment of sodium amalgam or of sodium tin, is added, when the solution is acid. The efficacy of these depends on the evolution of a small amount of hydrogen during the process.—*Dingler's Polytech. Journal.*

GOOD HEALTH.

The Value of Borax in Colds.

Dr. J. W. Corson, of Orange, N. J., has published some interesting notice on the use of borax and nitrate of potass, in aiding the voice, as sometimes required by singers, clergymen, and public speakers. The value of nitre, or sal prunelle, has long been recognized, and if it is increased by the aid of borax the fact is worth knowing. Dr. Corson sums up the result of his inquiries as follows:—

1. That in sudden hoarseness or loss of voice in public speakers or singers, from "colds," relief for an hour or so, as by magic, may be often obtained by slowly dissolving and partially swallowing a lump of borax the size of a garden pea, held in the mouth for ten minutes before speaking or singing. This produces a profuse secretion of saliva, or "watering" of the mouth and throat. It probably restores the voice or tone to the dried vocal cords, just as "wetting" brings back the missing notes to a flute when it is too dry.

2. Such "colds" may be frequently broken up at the very commencement; and this restorative action of the borax to the voice may be materially aided by promptly taking the evening previous to a public effort, dissolved in a glass of sweetened water, a piece of the nitrate of potass, or salpetre, a little larger than a garden pea, on going to bed, and covering with an extra blanket. The patient should keep warm next day. This both moistens the throat and further relieves the symptoms of cold and slight blood poisoning from suppressed perspiration, by reopening the millions of pores of the skin more or less closed by cold.

3. These remedies have the three recommendations of being easy to obtain, convenient to carry in travelling, and perfectly harmless.

USE OF COLD ABLUTIONS IN FEVER BY THE FRENCH.—In a valuable article contributed to one of the French medical journals by Dr. L'Ambert he presents the following conclusions concerning the use of cold ablutions in fever, as practised in France: They are especially useful in typhoid and the eruptive fevers, and strongly indicated in malignant cases. They act upon the chief and most constant phenomena of these diseases, are especially anti-febrile, and reduce temperature materially. They favor the re-establishment of a full, profound, regular perspiration; render the secretions more active; make the skin supple, moist and fresh, favor the outcome of the eruption; allay cerebral and other nervous excitement, suppressing headache, coma, delirium, restlessness and inducing sleep; cause the pulse to fall from eighty to thirty-beats. From two to eight hours is the duration of their action, the ablutions to be repeated two to four times in the twenty-four hours. They have no influence upon the length of the sickness, but render it milder, and are readily applied as cold baths or by wrapping the patient in a cold wet sheet.

CHLOROFORM IN CHINA.—According to a reported discovery by M. Stanislaus Julien, it appears that as far back as the third century of our era, the Chinese were in possession of an anæsthetic agent which they employed in the same manner as we use chloroform and ether, for producing insensibility during surgical operations. A description of this was discovered by M. Julien, in a work preserved in the Bibliothèque Nationale—called "Kon-kin-tong," or a "General Collection of Ancient and Modern Medicines," which appears to have been published in the sixteenth century. In a biographical notice of Ho-shao, who flourished under the dynasty of Wei, between the years 220 and 230 of our era—it is stated that he gave the sick a preparation of *chanvre* (Indian Hemp), "Mayo," who in a few moments became as insensible as one plunged in drunkenness or deprived of life; then, according to the case, he made incisive, amputations, and the like. After a certain number of days the patient found himself re-established, without having experienced during the operation the slightest pain. It appears from the biography of Ho-shao that this *chanvre* was prepared by boiling and distillation.

FURNACES FOR HEATING DWELLINGS should never be made of cast iron as is generally the case, for the reason that the unhealthy gases of combustion—carbonic acid and carbonic oxide readily permeate such iron when hot, and are thus distributed through the dwelling to the great detriment of health. The furnace should be made of wrought iron exclusively—hoiler iron through which when properly put together, scarce a trace of those deleterious gases passes. The expense is greater, but not sufficient to outweigh the health consideration. Wrought iron furnaces are largely supplying the place of cast iron ones in our Eastern cities. In cold countries, especially, this matter, as a sanitary question rises to great importance; and, indeed, it is quite time that more regard was paid as to the character of the air we breathe in our dwellings, school rooms and public buildings.

LEAD-POISONING.—A manufacturer of red lead, in France, saves his workmen from disease by obliging every man to drink a quart of milk a day. Instead of one-third of his men being on the sick-list, he has not had one case in eighteen months.

Reward for a Cholera Specific.

During the cholera epidemic of 1849, a prize of one hundred thousand francs was offered by M. Bréant, of Paris, for a specific remedy for that dreadful scourge. The attraction of this reward elicits every year most useful and interesting studies, but hitherto no one has solved the problem expressed in the following terms: Discovery of the means of curing the Asiatic cholera, or the indication of the precise causes of that dreadful disease. Every year, the Academy has to bestow some kind of encouragement on authors of very learned and useful memoirs on that question, but it is useless to say that not one has yet been found worthy of the principal prize.

Among others M. Tholozan, a military doctor, has been rewarded for his essay on the new origin of Asiatic cholera. He argues that cholera, although of Asiatic origin, may, nevertheless, begin and develop itself in Europe, and he instances the outbreak of 1852-1855, which spontaneously originated in Poland. This is a point of great interest, as it is a matter of much controversy among medical men of undoubted learning. M. Bouillaud, one of the Academicians, although disputing the accuracy of the author's conclusions, passed a well-deserved eulogy on M. Tholozan's researches, and summed up the Academy's sentiments on that question in the following words: There remains for our civilization the difficult but glorious task of tracking the monster to its cradle, or rather to its lair. We are still awaiting the advent of the *Hercules*, on whom will devolve the glory of so noble, so meritorious, so divine a work; but it is to be feared that in our day no such demi-god is likely to manifest himself.

KILLED BY KINNESS is a phrase which has just been luridly illustrated by statistics in England. Who would have believed, save upon the authority of the great Dr. Lankester, the London coroner, that not less than 3,000 tender infants are annually smothered to death by their mothers who fall asleep in bed while nursing their pledges? Unfortunately, mothers involuntarily kill their children in a great many other ways—by absurd indulgence in diet, by foolish exposure in dressing, and through utter ignorance of the laws of the human system. The only wonder is that the race, or at least the so-called civilized portion of it was not long ago utterly exterminated. Babies are called tender; it strikes us that they are remarkably tough.

REMOVING A FOREIGN BODY FROM THE NOSE. A case is related of a child from whose nose, when the surgeon had failed to remove a cherry stone, the village barber administered an emetic, and at the moment when vomiting was about to commence, clapped a handkerchief over the child's mouth, so tightly as to force the obstruction at once from its previously fixed location.

Another case is related where, under similar circumstances, an old negro woman advised: "Put yer finger 'long side the nose, t'other side from the thing, and with your own mouf over the child's mouf, blow hard, and ite bound to come out." The doctor followed the directions, with a favorable result.

WHEN BEGINNING TO USE GLASSES, use them as short a time as possible, only in deficient light, or on minute objects, and then change the strain to distant or larger objects. By a judicious attention to these two points, the age of the sight will be retarded many years. And as reading is one of the luxuries of the age, and one of its most delightful pastimes and amusements, we cannot be too careful of the eyesight, and should study how we may best husband its powers.

REMOVING AND RESETTING TEETH.—An English dentist recently had one of his teeth extracted, cleansed, caries removed from the crown and replaced in the socket, where it has taken fresh root. A dentist in Portsmouth, N. H., scientifically performed a similar operation some four or five years ago. We have a friend who submitted to a similar operation more than 30 years ago, and the tooth to-day is sound.

ENORMOUS BRAIN IN A BOY.—A boy, thirteen years of age, recently died in the Middlesex hospital, London, from injuries caused by a fall from an omnibus. His brain after death was found to weigh fifty-eight ounces, about eight ounces above the average male adult brain. The lad had been particularly healthy, without any evidence of rickets, and was very intelligent.

WHO REQUIRE MOST SLEEP.—Those who think most require the most sleep. Time gained from necessary sleep is not saved, but lost. Mind and body will both suffer. Most people, however, do not think enough to make early rising particularly dangerous. It is the hard-working professional man, the close student, or the man of business with many cares upon his mind, who suffers most from loss of sleep.

ZINC FUMES.—The action of zinc fumes upon the bones of the human system is very much like that of phosphorus. *Dental Cosmos* gives an account of the destruction of a large portion of a man's jaw bone by the fumes of zinc. The man was a brass founder, and was attacked by the zinc poison in pouring off the alloy zinc and copper.



B. EWER.....SENIOR EDITOR

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San Francisco:

Saturday Morning, Feb. 22, 1873.

Legal Tender Rates.—S. F., Thurs., Feb. 20.—buying 88½; selling 88¾.

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UNIVERSITY LECTURES.—The seventh of the University course of lectures was delivered on Saturday evening last, by Prof. W. T. Welcker on the "First Ideas of Mathematics." The lecturer described the early progress of that science in the hands of the ancients, in a graphic, instructive and interesting manner, and was listened to attentively by a large and appreciative audience. The next in the course will be delivered this evening by Prof. J. LeConte on "The Ancient Glaciers of California."

THE AYERLL CHEMICAL PAINT, in addition to its cheapness and durability, is said to possess another admirable quality—the capability of being washed without injury to the paint. J. W. Tuoker & Co.'s building, on the corner Sutter and Montgomery streets, painted in December 1870, by Sweet & Gadsby and washed this month, is referred to by the company as one among the numerous instances of its merits in all respects as claimed above.

PROSPECTING COMPANIES are being organized at Pioche on the co-operative principle, some working for wages while others prospect or develop. They are all working men and combine their means and labor to become mine owners. A good move, this, for the miners, provided too many men are not let in to the companies so as to divide up the share to too great an extent.

SUTRO TUNNEL.—It is said that since the Committee on mines and mining reported favorably on the loan to the Sutro tunnel, that its chances are good to pass the House. It is hoped that the project will not fail for want of means.

A BILL has been introduced in Congress granting the right of way for the construction of a tunnel under Mere Island straits between that place and Vallejo.

Mining as an Investment—Does it Pay?

The above question, probably for the first time in the history of mining on the Pacific Coast, is now being seriously argued by many persons, who for years have devoted their time and their money, to the exploration and development of the mines of California and Nevada. Of course ideas widely differ as to the interest a mine should yield on the original investment and all the expenses connected with the development of the property, such as steam machinery, reduction works, etc., before it should be classed as a really paying concern. The people of this country, as a rule, are accustomed to pay, and expect to receive high rates of interest, and consequently they imagine that if a mine does not pay for itself in a year or eighteen months, that it is of no value; others whose notions are not quite so extravagant, are satisfied with three or four per cent. a month; now, while we are perfectly willing to allow a fair margin, for the extra risk attending all mining speculations, we consider that a well defined quartz vein, properly explored, and managed economically and honestly, which will pay from three to four per cent. interest is a far more desirable property to invest in, than any farm or piece of real estate in California, and since the Pacific railroad has brought us into such close competition with the more frugal and economical people of the Eastern States, we fancy that there are few importers or wholesale merchants in this city, who have not to content themselves with about one-half of the profits on their various risks, which they would expect had they bought a mine instead of a cargo of tea.

The production of bullion last year in the States and Territories on the Pacific Slope was enormous, notwithstanding many drawbacks, such as a lack of reduction works, quartz mills, etc., in many of our new mining Districts. The amount of gold and silver produced will add up about \$62,000,000. And yet people in this city are strongly prejudiced against mines and say they are so risky, that they don't pay, and there is so much swindling going on, and etc. When we have a dry season in California and the wheat crop fails, which by the by, occurs oftener than is pleasant. There is no outcry about farming not being a paying business; when a ship with her precious freight goes to the bottom of the ocean, instead of bringing up safely in port, the owners hear their losses most philosophically, build another ship, buy more costly wares, and again trust all to the mercy of the winds and waves, and we never hear a word of complaint about merchandizing or shipping being a non-paying business. It would seem as though people reserved all their ill-humor and indignation for unfortunate mining speculations. When a man through carelessness and ignorance rushes blindly in, and purchases a worthless mine, of course he loses money; he should have availed himself of the knowledge of those who have made geology their study, and have been fully assured of what he was doing before he invested a dollar. But such a one is rarely willing to attribute his want of success to the proper cause; it is always on the mine, and on mining investments generally that the vials of his wrath are poured out. It is true he might have been swindled out of legitimate profits, even had he invested in a good mine. And if he risked his money in Washoe mining stocks, the chances are that a rescallo board of trustees would not only have confiscated his dividend, but have levied a heavy tax, in the shape of assessments on him, into the bargain.

But as he went in, for a little gambling in stocks, he must not complain, if he was beaten by those men who make such a pursuit their sole business; he may console himself with the reflection that he has many companions in his misfortune, both at home and abroad. Even in far distant England, they complain of having been swindled, on wild cat mines, still, when we come to investigate facts, we find that English companies at present own more dividend-paying mines in California and Nevada, than are quoted on the list of the San Francisco stock board.

The number of mines worked legitimately in this country is greater than many people suppose, and let any person at all conversant with the subject, take a trip through Amador, Nevada, Sierra and Plumas counties, to-day, he will find one hundred mines, the names of which he probably never heard of, yielding handsome dividends to the stockholders.

It would occupy too much space in this article to go into statistics, or enquire what such quietly managed companies as the Keystone, Amador, Kennedy, Mehoney, Idaho, Eureka, North Star and Sierra Buttes had yielded the owners; of one thing, however, our readers may

be assured; viz.; that there are plenty of such mines lying idle to-day in California, which can, and yet will be profitably worked, when the swindling hitherto practiced by a few California street stock operators, shall be counteracted by a little common honesty in mining management.

Giant Powder in Shallow Gravel Banks.

A correspondent writes us from Oregon in relation to the use of Giant Powder for bank blasting in shallow gravel mines. He wants to know whether the use of the powder facilitates work in gravel mines of not more than 18 or 20 feet in depth, the gravel being what miners call a "tight" or semi-cement intermixed with a tenacious or putty-like clay. The gravel and clay are not, properly speaking, intermixed, but alternate, or the clay will overlap the gravel. He tells us that he has a great many rocks or boulders to contend with in his claim, and asks "if the powder should be used in such a claim, what is the *modus operandi*, that is, is it better to drive a horizontal or a perpendicular hole?"

In answer to our correspondent's queries we would state that in shallow gravel benches, in pipe clay and cement, No. 2 Giant Powder is used with perfect success. Whether the holes should be horizontal or vertical, depends considerably on the face and shape of the bench, and the work required.

If the face of the bench be "squared up," a series of vertical shots, fired with electricity, will throw up, and pulverize, the bench. The same is true of horizontal and angling shots in working up the bottom. A few experiments in a claim will decide which are the better shots to put in. In breaking boulders (if very hard), small drills, cutting ¾ inch holes, and 3½ pound hammers are of great advantage, used in connection with Giant Powder, of either grade, though the No. 1 is more preferable—one man doing twice the work of two men with large drills and black powder. The method of loading bore-holes we have previously described. The cartridges, however, should be as near as possible, the size of the drill-hole; the Company make them from ¾ of an inch to 6 inches in diameter. It is somewhat difficult to lay down rules as to which kind of shot to trust in, unless the character and situation of the ground is known; but, as remarked before, a few experiments will show which is best.

Academy of Sciences.

The regular semi-monthly meeting of the California Academy of Sciences was held on Monday evening, when James Lick and George C. Hickox were elected life members and Gregory P. Hart a resident member of the Association.

Donations to the Cabinet.

A specimen of hornblende, containing 20 per cent. of magnetic iron, from the Chilcat River, Alaska, was presented by Professor Davidson.

Captain G. T. Lawton sent to the Academy, fossil bones of a rodent, from a drift of the Eureka Consolidated mine, in Nevada, found 247 feet below the surface, near the top of the ore, and immediately under the hanging rock of limestone; a specimen of silver ore from the same mine was received. Among the other contributions was a fossil from the Arizona Desert, a specimen of fish lice from the fish in San Francisco Bay, the head of a black-tailed deer, and some worm-eaten piles from Greenwich Dock, destroyed by the new marine worm which has recently made its appearance in our harbor. The worms were seen attached to the pile. T. J. Arnold, engineer of the seawall, was under the impression that the worm is the *limnoria terbrans*. Dr. George Hewston read a paper on the subject of marine worms referring particularly to the one in question.

The Academy received a handsome gift of a lot of land from Mr. James Lick, which is referred to at length in another column of this issue.

Miscellaneous Business.

The President, Professor Davidson, read a paper "On the Probable Periodicity of Rainfall," which we will give with appropriate diagrams next week.

A gentleman, who proposes to read a paper on the possibility of inducing rainfall by artificial means, asked permission to do so, which was granted.

Mr. Dall, of the United States Coast Survey, read some interesting notes and memoranda on different birds noticed in Alaska, during his visits to that Territory.

After some discussion relative to the condition under which Mr. Lick's gift was made, the Academy adjourned.

Spectrum Analysis.

An important and interesting series of lectures was inaugurated on Wednesday evening last, by Prof. Neri, in the Hall of St. Ignatius College, on "The Spectroscope and Spectroscopic Analysis." Being introductory, it was somewhat elementary, but highly interesting and instructive, and was fully illustrated with experiments, as, indeed, each of the succeeding ones of the course—five in all—will be, aided by the elegant and expensive apparatus connected with the institution named. From the tenor of this, we think the public may anticipate something of rare interest and merit; and on a subject which is attracting a larger amount of interest than any other matter now before the scientific world.

Though the introduction of the spectroscope dates back but little more than a decade, we already find it used for manifold purposes, not only in scientific investigation, but also in industrial and useful arts as well. It has given us important revelations with regard to the constitution of blood and many other very deep substances; it greatly aids the geologist in many of his investigations; it is a most perfect and convenient medium for detecting adulterations in food; it aids the assayer at almost every step in his tedious and difficult works of analysis; and the lecturer was informed, just as he took his place on the stand that it is now used at the English Mint in London, as a most delicate test and check upon the several modes of assays employed there.

Spurning the narrow limits of earth, the spectrum goes out into space and undertakes to analyze the heavenly bodies; and by it, questions left unanswered for ages are now readily solved. It has made known to us the nature of the colored stars—a puzzle for ages. The character of comets and of nebulae are by it quite fully unfolded, and it is employed to measure even the motions and velocity of the most distant orbs whose light can be enticed within its magic influence.

The lecturer proceeded to give some idea of the ordinary modes and analysis, by both the wet and dry way, in order to show how the spectrum may be and has been brought to hear upon such investigations. His exhibitions of the various colored flames appeared to interest his auditors very much, and though simple and elementary in character, should be kept in mind to aid the hearer in understanding the future lectures of the course, during which the Professor will explain, step by step, with appropriate illustrative experiments, the introduction and progress of the spectrum in the history of science and the arts.

The electric current was introduced and the nature and connection of its use in spectrum analysis explained. The fact, that various colors may be given to the electric current, by the employment of different substances to form the positive pole of the battery was shown. The importance of this fact in connection with spectrum analysis will appear in future lectures. Some beautiful experiments in this connection were shown by sending the electrical current through various series of Geissler's tubes, in which the same current was made to assume, in its different sections, various colors during its transit through those tubes, charged with gases which gave off the colors shown when raised to the point of incandescence by the passage of the current.

This series of lectures will prove a rare treat to our citizens, and it may be mentioned that this is the first opportunity, out of actual school instruction, which the people on this Coast have had of becoming acquainted with the nature and value of the spectrum, and its various uses. The next lecture will be given on Monday, the 5th of March.

A LESSON TO "SALTERS."—The miners at Georgetown, Col., went to rely on the ore in their mines as it is, without any assistance from outsiders. They have every confidence in being able to sell what mining property they want to, without resorting to dishonest means to enhance its value in the eyes of speculators. At the same time the reputation of the country must be preserved. With these facts in mind they gave a very appropriate lesson to some dishonest miners who were caught salting rock with chloride of silver. They took two of the men, put ropes around their necks and after choking them until they were nearly dead, turned them adrift. The Denver News, which tells the story, says the assay value of the ore was 42 ounces per ton, while the salted sample returned 330 ounces per ton. If this course had been pursued to any extent in the mining localities, while the reputation of the camps would have been bettered, the population would have decreased considerably.

THE SNOW in Little Cottonwood Cañon, Utah, is still very deep and there is great danger of slides. The miners of Nevada county, Cal., are laying off, because the snow has closed up the ditches and shut off the water.

Artificial Stone for Building and Other Purposes.

Availing ourselves of a pleasant day this week, we paid a visit to the Frear Stone Works on Bluxome street, between Fourth and Fifth, and near the freight depots of the Central Pacific Railroad. Judging from the amount of stone-work we saw in the buildings the company must be doing a pretty good business. The premises occupy a space of 300x120 feet, upon which are erected a number of one-story buildings, all connected together, and divided up into different apartments. Large bins for storing the sand and gravel used in manufacturing the stone are filled with the substances, the former of which is procured from Oakland har. The sand is used in a natural state, no melting or crystallizing being done.

The patent under which the Frear Stone Company operates is on the chemical solution which is mixed with the sand or gravel. The facing of the stone is made of fine white sand, and the back portions of sand and gravel mixed. This facing sand is all selected, so as to be free from iron or other impurities, and is then thoroughly dried and sifted to eject the natural moisture. This care enables them to get a fine surface to their work. The process of manufacture is exceedingly simple. The sand after being dried and sifted is dampened so that it will hold together, with the patented solution. A certain proportion of Portland cement is ground fine and mixed with it, and the whole is stamped into moulds previously prepared. After the mixture is pressed in sufficiently it is removed from the mould and set aside to "cure." After a few days "curing," the stone is perfectly solid, but the Company prefer to keep the work at least six weeks, so that there will be no danger of breakage. There is on the premises a vat for drying the same, and a few small mills for grinding and sifting the cement. After the mixing is perfected the material is carried to the moulding room, and from thence in its proper forms to the drying rooms. The company make their own patterns and have a shop set apart for the purpose. So that if any one desires any particular design of any kind whatever, he can have the pattern made to suit him, and the stone will be moulded in the desired form. In making the moulds the patterns are set inside of a heavy box in all cases and the mould set inside of that.

They are now engaged in making a number of burial cases in which coffins may be placed, and the cover of the case secured with cement, thereby preserving the contents from the attacks of moisture or air. A number of urns of different sizes, as well as fountains, are being made, and also several pedestals with the appropriate names upon which the marble statues at Woodward's Gardens are to be placed. Considerable fence and cemetery work is being done, horse blocks, building material, ornamental work, etc. There is a large amount of Portland cement in the warehouse and more is on the way. At present 20 men are employed. They calculate to furnish the Frear Stone for one-third less for ornamental building and plain work, than is charged for natural sandstone, and for less than half the cost of finished granite.

This stone is now coming into extensive use in this city and elsewhere. Beside the stone used in ornaments on the Niantic Building and Tallant's New Bank, Bartlett's Block in Oakland, three stories high, has the whole front made of plain solid Frear Stone. We saw at the office of the Works, photographs of a number of buildings which have been erected in New York and Chicago, which show the elaborate designs which may be adopted. There is a piece of stone at the Works, which was under the effects of the Chicago fire, which shows no signs of having been subjected to heat. The Works in this city have only been under way since last August.

The experience of the Chicago and Boston fires has done much to turn the attention of the public to the necessity of fire-proof building material; for what was supposed previously to be fire-proof, failed at the moment when these properties were most necessary. Granite, which everybody considered as a barrier to fire, flaked off in large pieces during those conflagrations, and both brick and sandstone crumbled before the flames. The Frear stone, however is said to have stood the test admirably, as numerous statements verify. Merrill Ladd, Esq., President of the Mutual Insurance Company of Chicago, writes as follows: "In passing through the 'great fire' no signs of flaking, splitting or disintegration were perceptible, as was the case with all natural stone (even granite) which was used in this city. I will say, in conclusion that I believe Frear Stone to be the best material that can be used for building where strength, solidity and protection against fire, are desired." Dr. Adolph Ott, in a lecture on "Portland Cement and Portland Cement Stone," read before the Polytech-

nic Club of the American Institute, and published in the *Industrial Monthly* some months since, includes the Frear Stone among the Portland cement stones and says: "To any one acquainted with the chemical composition of cement stone, it must at once become evident that, with regard to its resistance against fire, it ought to supersede most building stones."

The company manufacturing Frear Stone in this city is incorporated under the laws of the State of California and although the product has not been invented long enough to prove by practice its efficacy against the ravages of time

and atmospheric influence, it has successfully borne severe tests of scientific skill. Instead of the action of the moisture of atmosphere, it has been subjected to immersion in boiling water and the steam bath, without change or injury. It has been tested in a furnace instead

of stent parts; adhesiveness of the cementation; non-liability to fusion or disintegration by fire. Since with all these advantages it can be made so cheaply and so rapidly, whatever the design, it is destined in the future to take a large part in the construction of edifices in cities and towns. In the country it can be made on the spot, provided sand and gravel is to be found in the vicinity.

The illustrations shown on this page represent two buildings constructed of Frear Stone; the lower one shows the Dwight Place Church, at New Haven, Conn., and the upper one is



"THE HALE BUILDING," CHICAGO.

the Hale building, a five-story structure 90 feet by 100, which is in Chicago. The entire stone-work of the church was made from sand excavated from the foundation and formed into artificial stone by the Frear process. It is stated that the cost was one-third less than if it had



CHURCH AT NEW HAVEN, BUILT OF FREAR STONE.

of in the sun. Instead of the corrosive gases of a manufacturing town, using coal for its fires, it has been placed in a bath of sulphuric acid. Instead of being placed in buildings to sustain a crushing pressure, the pressure has been mechanically applied, of 57,000 pounds on a four-inch cube at the age of four weeks. The following advantages are claimed for it: compactness in combination with the character of the constituent ingredients; freedom from metallic mixtures; uniformity in its structures and con-

struction; adhesiveness of the cementation; non-liability to fusion or disintegration by fire. The style and finish of the exterior is very effective, the details being elaborately worked and in perfect harmony with the general architectural designs.

The Hale Building, in Chicago, has an imposing front, in modern style, and makes a very handsome edifice. The Frear stone is playing quite an important part in the reconstruction of Chicago, and is highly commended by the local press.

PATENTS & INVENTIONS.

Telegraphic List of U. S. Patents Issued to Pacific Coast Inventors.

[REPORTED OFFICIALLY FOR THE MINING AND SCIENTIFIC PRESS, DEWEY & CO., PUBLISHERS AND U. S. AND FOREIGN PATENT AGENTS.]

By Special Despatch, Dated Washington, D. C., Feb. 18th, 1873.

FOR WEEK ENDING FEBRUARY 4th, 1873.

CANTEN.—Richard Kelly, Red Bank, Cal.
CAR STAKE SUPPORTER.—Wm. H. Masterman & Wm. T. Hooper, Stockton, Cal.
PEO RASP.—Jeremiah W. Foard, S. F., Cal.
FINGER BAR FOR HARVESTERS.—Chas. A. Smith, Napa, Cal.
CURING TOBACCO.—James D. Chup, Gilroy, Cal.
RAILWAY SNOW PLOW.—W. Walker, Fort Bridger, Wyoming Territory.
BLACK BOARD ERASER.—Winfield S. Read, Oakland, Cal.
HARVESTER CUTTER.—Warren Wasson, Phineas F. Powers, Geo. W. Duogan, of Genoa, Nevada.

DESIGN.

CENTER PIECE.—Samuel Kellett, S. F., Cal.

TRADE MARK.

I. X. L. METAL CO.—Anti-Friction Metal and Journal Bearings for St. Louis, Mo., and Sacramento, Cal.

Following is a list of inventions patented in England by inventors in the Pacific States and Territories from Aug. 6th to Dec. 31st, 1872:

WASHINGTON ORES.—W. Rickard, Monitor, Cal. Dated Aug. 28, '72.
UTILIZING HYDROCARBONS, ETC.—Perry Franklin Goodrich, S. F., Cal. Dated Dec. 3, '72.
RAILROAD COUPLING.—H. Clay Kihhe, S. F., Cal. Dated Dec. 6, '72.

—The patents are not ready for delivery by the Patent Office until some 14 days after the date of issue. NOTE.—Copies of U. S. and Foreign Patents furnished by DEWEY & CO., in the shortest time possible (by telegraph or otherwise) at the lowest rates. All patent business for Pacific coast inventors transacted with greater security and in much less time than by any other agency.

Ammonia for Cleansing and Other Uses.

The uses to which ammonia can be put are extending daily, as its value becomes better known. This is the case not only in the arts but in domestic economy where its varied applications are beginning to make it recognized as a valuable article. The liquid, ammonia, plentifully diluted is found to increase the growth of house plants, and as a cleanser and purifier it stands paramount. The fact that fatty and greasy matter saponifies with ammonia is taken advantage of in many ways. By adding a little to warm water, paint can be washed thoroughly and much easier than with soap alone. By the addition of a teaspoonful to a basin of water for bathing, it is softened and imparts a delightful sense of coolness after washing. It will clean hairbrushes, etc., most effectually by dipping them in a solution of warm water and ammonia; will cleanse cutlery, carpets, crockery, glass and floors. A few drops on a window-pane will clean it as bright as possible, and much better than water alone.

From whatever place grease spots are to be removed, whether from the floor, paint, woolen or other fabrics, it is very convenient. Ammonia has been used with good effect in curing poisonous bites, such as those of snakes, etc. Mixed with oil it is used as a soap, under the name of soap liniment. Experiments are being made with it as a motive power from the fact it only employs 126 units of heat in its expansion, while water absorbs nearly five times as much heat. The common liquid boils at 122° and affords a pressure of six atmospheres at 232° F., while steam requires a heat of 320° to produce the same results. It is said that ammonia prevents iron from rusting although it acts on copper and brass. We understand that ammonia for washing and cleansing purposes is being manufactured in this city in quantities and is being sold by the retail grocers, so we hope there will be no future necessity for further importation. When people become more accustomed to use it, they will realize the benefit to be derived from it to a greater extent. The article made here is intended in a measure to be used for washing purposes, and there is every reason to be assured that it will aid materially in cleansing clothes. It is universally used in Europe for every-day family use and if offered at proper prices here, so as to bring it within reach of every household, will rapidly come into favor as it has elsewhere.

A 15-STAMP MILL is between Fort Yuma and Hardyville, on its way to Sacramento District, Arizona.

Farming vs. Mining.

An important suit has been on trial in Oroville during the three weeks past, involving the liability of miners for damage done to farming lands by means of mining debris washed on the lands from mining claims above. The plaintiff is a farmer on the bottom lands on Dry Creek, in Butte county, eight miles below the hydraulic mines of defendants, which are located on Sawpit Ravine, and sued defendants to recover \$2,000 damages for injuries to his farm by reason of the deposit of debris from defendants' tailings, and also for an injunction to put a stop to the mining operations of defendants, a continuation of which, it was alleged, would result in the destruction of plaintiff's farm. The testimony showed that the injury would have been the same had the defendants not been engaged in the business of mining; that the damage resulted from the action of fifty or more companies, and the jury were, in consequence, unable to find the exact proportion of damage committed by the defendants, the result being a substantial acquittal of the latter and a denial of redress to the plaintiff. The Marysville Appeal says of this case:

Probably no mining suit ever before tried in this State has attracted more universal interest among miners, who have been represented at the trial from nearly all of the mining districts throughout the State, some having been subpoenaed as experts and others attending out of curiosity and personal interest. While the verdict does not decide that mining companies are not responsible in damages for injuries to the lands of farmers by depositing tailings upon their lands, it yet discloses so many difficulties in the way of arriving at the question of liability, and the relative responsibility of the numerous companies that jointly contribute to make up the aggregate of such deposits, as to show that the farmer can have but little show in making out a defined case that will secure him damages. In the present instance the verdict is very generally sustained by public sentiment. It was shown in evidence that over a million dollars had been spent by the mining companies interested in the issue; that having perfected their works at enormous expense, they were now prepared to reap the reward of their enterprise, and that the probable yield of these mines was estimated at from \$50,000,000 to \$100,000,000. A single day's yield of the precious metal, judging from what these mines have heretofore produced, would amount to more than the value of every farm that could possibly be effected by their operations.

It was in evidence that plaintiff's improvements were of the value of \$2,500. If the statements of the relative value of the mining and farming property are correct, and if, as appears from this testimony, the mining operations whose results were complained of were under way prior to the occupation of lands below for tillage, in the knowledge of plaintiff, the finding of the jury is in substantial accord with the larger equities of the case. Abstractly, it is a matter of great regret that any person who has made a home on a piece of land, planted and beautified it, should be a sufferer from mining operations near him. But it must be remembered that public policy has allowed the use of stream channels for such operations for twenty-three years, and that in such cases as the above, mining had been going on almost exclusively for a greater part of that period. Such instances of injury to garden and farming lands are much less frequent now than some years ago, and will be still less frequent hereafter, with the diminution of the placer mining area, the better enforcement of the recognized rights of prior occupation, and the general operation of the system of ownership in fee to the mineral lands, which is being accomplished under the recent legislation of Congress. Public sentiment in the mining regions is more just to the agricultural interest than of old. This interest is seen to be of great value, is often in alliance with mining, and assists largely in bearing the burdens of taxation and making a residence in the mining regions not only more endurable but positively attractive. Hence it is not to be expected that any gross injustice to the cultivators of mineral soil will be tolerated, and in cases like that tried at Oroville, the decision is against them, it will be on the ground of consideration for the rights of the larger number who were first to begin their industry.

THE RICHEST MINE.—In a San Francisco paper of last week we notice the following item: The noted Gwin mine of Lower Gulch, Calaveras county, is now yielding more gold than any other mine in the State with the same milling capacity. The clean up last Sunday, after a run of six days with 36 stamps, resulted in obtaining \$9,160—a yield of over \$1,500 per day.

The Call, from which the above item is taken, is evidently not posted upon Grass Valley mining matters. For its special benefit we would, therefore, intimate that the Idaho mine, in Grass Valley, running 35 stamps, for six days, cleans up, from its amalgamators and plates alone, an average of \$20,000, or over \$3,000 a day, and the Enreka mine, with ten stamps and a run of six days, has been cleaning up \$12,000 or \$2,000 a day.—Grass Valley Union.

A New Telegraph Cable.

A correspondent of the *Alto* writes as follows from Washington under date of Feb. 3d: Signor Celso Caesar Moreno, an Italian gentleman who has resided many years in China, is here representing the interests of the American, Japan and China Telegraph Company. A consideration of his project must be of interest to the people of the Pacific Coast, whom it is especially intended to benefit. The company was originally called the American and East India Telegraph Company. Its charter is obtained from the State of New York. It is organized with a nominal capital of \$10,000,000, representing 200,000 shares of \$50 each. The officers are as follows: President, Dudley J. Gregory, of Jersey City, New Jersey; Vice-President, Josiah Oakes, New York; Treasurer, Wm. F. Stearns, New York; Secretary, Chas. D. Kellogg; Directors (including President): Samuel W. Torrey, Esq., Hon. D. D. T. Moore, Maunsel B. Field, Esq., Joseph T. Sanger, Esq., and Wm. H. Waring, Esq., of New York; Hon. George N. Kennedy, of Syracuse, N. Y.; Hon. John A. Goodwin, of Lowell, Mass.; John N. Knapp, Esq., of Auburn, N. Y.; Hon. Samuel G. Arnold, of Providence, R. I.; and C. S. Bushnell, Esq., of New Haven, Conn.

This Company propose to lay a telegraphic cable from San Francisco to Japan and China by way of the Aleutian Islands on the north, or the Sandwich Islands to the south. The route will be chosen in view of practicability and economy hereafter to be determined. It will be seen that little is asked in aid of the enterprise by reading the text of the bill introduced in the Senate April 10th, 1872, by Mr. Frelinghuysen, and referred to this Committee on Foreign Relations. It is as follows:

A Bill to encourage and Promote Telegraphic Communication Between America and Asia.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress Assembled, That the American and East India Telegraph Company (the name to be changed to the American, Japan and China Telegraph Company,) shall have the right to construct, land and maintain a line or lines of telegraph or sub-marine cable on the Pacific Coast of the United States, to connect the American and Asiatic Coasts by telegraphic lines, wires, or sub-marine cables: Provided, That said company shall begin to lay said cable within two years from the passage of this Act.

Sec. 2. That in order to encourage and aid in the construction of said line or lines of telegraph the Secretary of the Navy shall detail, for the surveys and soundings on and along that portion of the Pacific Coast in America and Asia where it is proposed to establish said telegraph lines, one or more steam vessels, to be at the disposal of said company, to assist in surveys and soundings, laying down and summing of cable, transporting materials connected therewith, and generally to afford any assistance calculated to promote the success of the enterprise.

Sec. 3. That the Government of the United States shall at all times have priority in the use of the lines of said company for all diplomatic and Government business; and in order to secure the same from injury by evil-disposed persons, to the interruption of public business, the Secretaries of the Navy and of War are authorized to direct the commanders of military and naval districts or stations traversed or occupied by the stations or lines of telegraph or cable belonging to said company, and other officers acting under the authority of the United States, to use any force at their command to protect the same. Said lines of telegraph shall be open at all times to the public, and to any other company, upon the payment of the regular charges, for the transmission of dispatches, excepting when in use by the Government of the United States.

Sec. 4. That the better to promote and facilitate international intercourse and the public interest, Congress may at any time repeal this Act for neglect on the part of the company to fulfill and comply with the conditions herein expressed.

Sec. 5. This act shall take effect immediately.

The Scheme is American

In inception, organization and prospective profit. The company appeals for aid in the manner above shown, stating in eloquent language the necessity we labor under of looking to the Pacific for a revival of our commerce. They ask for no subsidy whatever—only the use of Government ships in making soundings preparatory to commencing the work. They say: "The impossibility of consummating such a scheme without governmental aid and protection is too apparent. No capital could be procured without such aid, and we could not ask for less than we do. But for such aid to Morse in March, 1843, the world might still be without telegraphs."

The Prospects

Seem favorable for Signor Moreno's success, although little time is yet at the disposal of Congress. The bill is before the Committee on Foreign Relations in both houses. It may not pass at the present session for want of time, but attention has been sufficiently drawn to the subject, so that at the next session at least, it is to be hoped, something will be done. It is not improbable, however, that success may attend the efforts of the company this winter.

A Hermit Inventor.

The *Territorial Enterprise*, of the 7th ult., says:

In a lone cabin among the hills to the eastward of this city lives John Duhois, a man full of eccentricities and a genius in his way. In his cabin, far away from the noise and bustle of the town, he leads the life of a hermit. He is a good mechanic, and always at work upon some new invention. Among the inventions he has completed, is a windlass of peculiar construction, for use in mining, which is said to possess many advantages over everything of the kind heretofore produced. He has also invented a car for use in the mines which is said to be far superior to anything now in use. It can be managed by a boy ten years of age, and dumps either over the end or the side, without the least danger of its being thrown off the car-track. For this invention we believe he has applied for a patent. His great machine, however, is some sort of contrivance for the multiplication of power and speed. He has been at work on this for years, and has at last brought it to perfection and obtained a patent on it. What the machine is like we cannot say, as we have never seen it, but the gentleman who furnishes this curious genius with provisions and other necessities, says it is a most ingenious contrivance and will do all that is claimed for it. According to his description, all the machinery is on a single shaft, and the apparatus for multiplying power and speed is contained in a drum or cylinder that surrounds the shaft. The first machine of this kind was somewhat rough, and he destroyed it, after finding that it would work, and has since made one with which he has taken great pains. He is satisfied that he has half a dozen fortunes in his several inventions, had he sufficient means to bring them into notice. Here is probably a chance for a man with a few thousand dollars to make himself a millionaire and equally enrich the old hermit-inventor.

STOCKTON AND IONE RAILROAD CO. — A despatch to the *Chronicle* states that on the 13th inst. the articles of incorporation were filed in the office of the County Clerk of San Joaquin county, for the Stockton and Ione Narrow-gauge Railroad, with E. S. Holden, President; H. E. Hall, Secretary; E. R. Stockwell, Treasurer, and nine of the most substantial men in landed interests and business relations in this section of the country as Directors. A liberal sum has already been subscribed, and many large subscriptions have been awaiting the opening of the books, which has been very magnanimously deferred until the formation of the San Joaquin and Tulare Company, so as not to interfere with that project, which, being assured, removes all further delay.

The work will commence upon this new project at the earliest moment. Dr. Holden, the President, is the principal organizer of many railroads and agricultural projects in California, and under his management the Stocktonians feel jubilant over the success of the enterprise.

A CHANCE FOR MANUFACTURERS. — A correspondent of the *Bulletin*, writing from Healdsburg, Sonoma county, says: The people here are much interested in the subject of establishing some kind of manufacturing industry of character and importance at this point. Near the base of Fitch mountain and close to the town, is a splendid water-power which can be utilized at a comparatively trifling cost, and made serviceable for manufacturing purposes. This, John D. Hassitt proposes to donate to any one who will start a manufacturing enterprise here—together with all the necessary ground for building purposes, etc. In addition to this, the citizens will donate several thousand dollars. The raw material for certain kinds of manufacturing can be had here in abundance. We have a climate scarcely surpassed in the world, and the soil the most prolific, and never failing to yield abundant crops to the industrious man.

RAILWAY ACCIDENTS.—Since last February the *Railroad Gazette* has made up monthly exhibits of railway accidents occurring in the United States, giving their nature and causes, as nearly as could be learned, and the number of persons killed and injured. The number of accidents for December is 412, which is larger than yet reported for any single month. The attending fatalities were 42, but this number was exceeded in June, on account of the Grand Trunk disaster. The number injured, but not fatally, yet reported. Sixteen of the 112 accidents caused death, and 28 other injuries to persons; and, therefore, 68, or about three-fifths of the whole number resulted in injury to property only.

RAILROADS IN THE MINES.—The Salt Lake, Sevier and Pioche Railroad Company will have forty miles of road completed by next June, making connection with steamers on Great Salt Lake, twenty-two miles from this city, running thence to Stockton, in the heart of a rich mineral district.

THE new locomotive for the Pioche and Bullionville (Nevada) Narrow Gauge Railroad has been shipped from Lehi, and it is now confidently asserted that trains will be running over the road before the expiration of the present month.

THE FLORAL MILL at Pioche has been completed and is now ready for use.

What Swan & Co. are Going to do About Packages.

In investigating the box question we had occasion to call at the Union Box Factory, No. 114 and 116 Spear street. This is a large establishment, 92x137½ feet, and the proprietors have been a long time at work introducing new machinery and new methods for reducing the cost and improving the quality of all sorts of packages.

Their improvements rest upon slicing timber instead of sawing, and an impervious coating by which they can make a wooden box hold anything.

By means of two large knives sliding in gates they can cut timber into slices from 1-64 to ½ an inch thick, and leave it as smooth as writing paper. Thus they save the timber formerly wasted in sawdust and chips, and the time and power necessary to make the sawdust and chips. By furnishing wood so thin it can be used instead of pasteboard, and the same weight and thickness of material makes a stronger, stiffer, better box. It can be covered with any kind of fancy paper for a finish. This impervious coating enables them to use wood instead of tin with the advantage of a non-conductor of heat, no rust and no taste. One man wants 100,000 lard caddies, and they are constantly being adapted to new uses as coffee boxes, pickle jars, jelly boxes, etc. They can be made round, square, octagon or any shape you wish.

Peach Baskets at Half the Old Price.

These are made light, neat, nesting nicely and at half the price that any others can be sold. Like everything else made from sliced stuff they can be shipped in the flat, so as to take up no more room than so much solid timber, and can be put up where they are used.

Boxes for Plums, Apricots and Cherries

Have been very extensively used the past year and furnished at thirty per cent. less than old prices. Their use has demonstrated the fact that the principal strength of the square box depends upon the pieces that hold the nails. If only the ends are strong the top, bottom and sides may be quite thin. These are generally put up where used.

For Berries,

He furnishes four or eight-pound drawers suitable for slipping into common chests at \$25 to \$30 per thousand. These are sent in the flat and can be put up very rapidly by almost any boy or Chinaman. He is also experimenting with a package greatly in favor in Chicago, as a one and two-pound basket. It will be very cheap and very light.

Grape Boxes

Are made similar to strawberry drawers, save that they have a cover which turns back so that the fruit can be shown without drawing any nails. An extensive experience in shipping grapes to the New York and Boston markets, in different kinds of boxes, convinced us that the most money was to be made by shipping in as small a box as would answer to pack grapes nicely without cutting the clusters. The fruit reaches the table in much better order from the original package than when taken from a large box, weighed and sent home in a bundle.

All these light boxes have corners made by scoring half way through the wood and bending it. We think something similar to this box will be used for all kinds of dried fruit, figs, raisins, etc. Fruit drying companies, as well individuals, will do well to turn their attention in this direction.

Wooden Boxes for Pickles and Jellies.

The use of this coating which makes the wooden box impervious to any liquid and tasteless, renders it the very thing for jellies, pickles, and a thousand household uses which will develop themselves in future. The wood ready cut for any style of box can be sent anywhere with the preparation for coating it, so the matter of freight cannot operate against their general introduction. Merchants can keep a large stock of this kind of goods in a small space and have work for the boys at odd spells.

Butter Chests

Are made here by the use of improved dovetailing machinery, so cheap that other box makers can do better to buy of Swan & Co. than to make them at home. The same machine that dovetails these is used for making tool-chests, bullion boxes, and anything that requires to be very strong. It makes the ordinary dovetail.

The Mitre Dovetailing Machine,

Is quite a curiosity and makes a wonder of a box, both as regards neatness and strength. It cuts a groove in the end of the box, and a tongue in the side to slip into it so that a very strong corner is made, and you must knock off the top or bottom to see how it is done. It is used for fancy boxes ¾ of an inch thick and upwards.

Farmers' Clubs will do well to send for samples of these various styles, as Mr. Swan has kindly offered to send samples free to such organizations. It might be too much to ask him to send a butter chest without any pay; but he is a very liberal man and will do anything reasonable.

San Francisco, Feb. 20th, 1873.

UTAH MINES.—The snow hockade at Little Cottonwood is broken, and ore is coming down on pack animals. It is estimated that there are over 5,000 tons of ore on the dumps waiting for transportation.

DEWEY & CO.,
American and Foreign Patent
Agents, Publishers of the
Mining and Scientific
Press, S. F.

PATENTS obtained promptly; Caveats filed expeditiously; Patent reissues taken out; Assignments made and recorded in legal form; Copies of Patents and Assignments procured; Examinations of Patents made here and at Washington; Examinations made of Assignments recorded in Washington; Examinations ordered and reported by Telegraph; Rejected cases taken up and Patents obtained; Interferences Prosecuted; Opinions rendered regarding the validity of Patents and Assignments; every legitimate branch of Patent Agency Business promptly and thoroughly conducted.

Our intimate knowledge of the various inventions of this coast, and long practice in patent business, enable us to abundantly satisfy our patrons; and our success and business are constantly increasing.

The shrewdest and most experienced Inventors are found among our most steadfast friends and patrons, who fully appreciate our advantages in bringing valuable inventions to the notice of the public through the columns of our widely circulated, first-class journals—thereby facilitating their introduction, sale and popularity.

Foreign Patents.

In addition to American Patents, we secure, with the assistance of co-operative agents, claims in all foreign countries which grant Patents, including Great Britain, France, Belgium, Prussia, Austria, Victoria, Peru, Russia, Spain, British India, Saxony, British Columbia, Canada, Norway, Sweden, Mexico, Victoria, Brazil, Bavaria, Holland, Denmark, Italy, Portugal, Cuba, Roman States, Wurtemberg, New Zealand, New South Wales, Queensland, Tasmania, Brazil, New Grenada, Chile, Argentine Republic, and EVERY COUNTRY IN THE WORLD where Patents are obtainable.

No models are required in European countries, but the drawings and specifications should be prepared with thoroughness, by able persons who are familiar with the requirements and changes of foreign patent laws—agents who are reliable and permanently established.

Our schedule prices for obtaining foreign patents, in all cases, will always be as low, and in some instances lower, than those of any other responsible agency.

We can and do get foreign patents for inventors in the Pacific States from two to six months (according to the location of the country) sooner than any other agents.

Home Counsel.

Our long experience in obtaining patents for Inventors on this Coast has familiarized us with the character of most of the inventions already patented; hence we are frequently able to save our patrons the cost of a fruitless application by pointing them to the same thing already covered by a patent. We are always free to advise applicants of any knowledge we have of previous applications which will interfere with their obtaining a patent.

We invite the acquaintance of all parties connected with inventions and patent right business, believing that the mutual conference of legitimate business and professional men is mutual gain. Parties in doubt in regard to their rights as assignees of patents, or purchasers of patented articles, can often receive advice of importance to them from a short call at our office.

Remittances of money, made by individual inventors to the Government, sometimes miscarry, and it has repeatedly happened that applicants have not only lost their money, but their inventions also, from this cause and consequent delay. We hold ourselves responsible for all fees entrusted to our agency. The principal portion of the patent business of this coast has been done, and is still being done, through our agency. We are familiar with, and have full records, of all former cases, and can more directly judge of the value and patentability of inventions discovered here than any other agents.

Situated so remote from the seat of government, delays are even more dangerous to the inventors of the Pacific Coast than to applicants in the Eastern States. Valuable patents may be lost by the extra time consumed in transmitting specifications from Eastern agencies back to this coast for the signature of the inventor.

Confidential.

We take great pains to preserve secrecy in all confidential matters, and applicants for patents can rest assured that their communications and business transactions will be held strictly confidential by us. Circulars free.

Engravings.

We have superior artists in our own office, and all facilities for producing fine and satisfactory illustrations of inventions and machinery, for newspaper, book, circular and other printed illustrations, and are always ready to assist patrons in bringing their valuable discoveries into practical and profitable use.

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Publishers, Patent Agents, and Engravers,
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Reports and estimates made about all departments of Production, Commerce, and Manufacture, of the Pacific Coast.
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5v19

RICHARD H. STRETCH, Civil Engineer,
City and County Surveyor.
Office—Room 16, City Hall.
11v24-3m

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CORDAGE COMPANY.
Manila Rope of all sizes. Also, Bale Rope and Whale Line constantly on hand. Tanned Manila Mining Ropes of any size and length manufactured to order.
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J. F. PAGES,
SEAL ENGRAVER,
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Stamps and Steel Stamps and Dies, 608 Sacramento street, San Francisco. Orders by express promptly attended to.

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Especially attention paid to

PATENT LAW.
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Physician and Operating Surgeon
FOR CHRONIC DISEASES,
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Diseases of a chronic and obstinate character, especially such cases as have for years, or a lifetime, resisted the ordinary modes of treatment, are the class of maladies in the treatment of which Dr. Aborn has become pre-eminent on the Pacific Coast, as well as throughout the Union, and by his success has achieved for himself an enviable reputation. 23v25-1y

The Merchants' Exchange Bank
OF SAN FRANCISCO.

Capital, One Million Dollars.
LEVI STEVENS.....President.
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No. 415 California street, San Francisco.
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STEINWAY & SONS'
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Pianos to Let.
A. HEYMAN,
1st street, between Sixth and Seventh,
Opposite old Capitol, SACRAMENTO.
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Metallurgy and Ores.

RODGERS, MEYER & CO.,
COMMISSION MERCHANTS.

ADVANCES MADE
On all kinds of Ores, and particular attention
PAID TO
CONSIGNMENTS OF GOODS.
4v16-8m

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C. W. STRONG & CO.,
Metallurgical Works,
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We purchase Ores, Bullion, etc. Ores worked and Tests made with care. Also, Assays of Gold, Silver, Copper, Lead, Tin and other Metals. 23v22-1f

LEOPOLD KUH,
(Formerly of the U. S. Branch Mint, S. F.)
Assayer and Metallurgical
CHEMIST.
No. 611 Commercial Street,
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CALIFORNIA ASSAY OFFICE
No. 512 CALIFORNIA STREET.
One Door West of Montgomery.....SAN FRANCISCO
J. A. MARS, Assayer.
Analysis of Ores, Mineral Waters, etc. 10v21

JOHN TAYLOR & CO.,
IMPORTERS OF AND DEALERS IN
ASSAYERS' MATERIALS
Chemical Apparatus and Chemicals,
Druggists' Glassware and Sundries,
PHOTOGRAPHIC GOODS, ETC.,
512 and 514 Washington street, SAN FRANCISCO

We would call the special attention of Assayers Chemists, Mining Companies, Milling Companies Prospectors, etc., to our large and well adapted stock of
ASSAYERS' MATERIALS
—AND—
Chemical Apparatus,
Having been engaged in furnishing these supplies since the first discovery of mines on the Pacific Coast.
Our Gold and Silver Tables, showing the value per ounce Troy at different degrees of fineness, and valuable tables for computation of assays in Grains & Grammes, will be sent free upon application.
7v25-1f **JOHN TAYLOR & CO.**

Important to Miners and Mill Men.
Silver-Plated Copper Amalgamating Plates,
for Saving Gold.

Of all sizes and in any quantity, furnished to order. Full instructions sent for operating. Particular attention given to plating goods for Builders, Plumbers, etc. Hotel and Restaurant work replated.
SAN FRANCISCO GOLD AND SILVER PLATING WORKS,
655 Mission street, San Francisco.
2v25-3m **E. G. DENNISTON,** Proprietor.

To Mill Men and Miners.
I am now manufacturing
CYANIDE OF POTASSIUM,

Which I can sell upon better terms than any other dealer on the Pacific Coast.
I make three grades or qualities to suit the requirements of different consumers.
I will be glad to furnish prices to any person addressing me on the subject.

HENRY G. HANKS,
Manufacturing Chemist,
PACIFIC CHEMICAL WORKS, SAN FRANCISCO
24v26-1f

Varney's Patent Amalgamator.
These Machines Stand Unrivaled.
For rapidly pulverizing and amalgamating ores, they have no equal. No effort has been, or will be spared to have them constructed in the most perfect manner and of the great number now in operation, not one has ever required repairs. The constant and increasing demand for them is sufficient evidence of their merits. They are constructed so as to apply steam directly into the pulp, or with steam bottoms, as desired.

This Amalgamator Operates as Follows.
The pan being filled, the motion of the muller forces the pulp to the center, where it is drawn down through the aperture and between the grinding surfaces. Thence it is thrown to the periphery into the quicksilver. The curved plate again draw it to the center, where it passes down, and to the circumference as before. Thus it is constantly passing a regular flow between the grinding surfaces and into the quicksilver, until the ore is reduced to an impalpable powder, and the metal amalgamated.
Settlers made on the same principle excel all others. They bring the pulp so constantly and perfectly in contact with quicksilver, that the particles are rapidly and completely absorbed.
Mill-men are invited to examine these pans and settlers for themselves, at the office, 229 Fremont Street, San Francisco

Richardson & Co., Copper Ore Wharves, SWANSEA.

RICHARDSON & Co. have been for thirty years established in Swansea as Agents for the preparation, Sampling, Assaying, and Sale of Copper, Silver, Gold, Lead, Zinc, and all other Ores and Metals, for which they have extensive Wharves and Wharves under cover, 1,000 feet of Quay Frontage within the Floating Dock, and the most complete Machinery and Appliances. They are also prepared to make advances against Ores in anticipation of realization, and to guarantee all payments when required. 11v24-1y

PLATINUM
Vessels, Apparatus, Sheet, Wire, Etc., Etc.
For all Laboratory and Manufacturing Purposes
H. M. RAYNOR,
25 Bond street, New York.
Platinum Scrap and Ore purchased. 23v18

CHARLES F. KIRCHNER,
Sampler and Crusher of Ores,
NO. 11 DRUM STREET,
San Francisco.

LEA & PERRINS'
CELEBRATED
Worcestershire Sauce.

Declared by Connoisseurs to be the only good SAUCE
Caution Against Fraud.
The success of this most delicious and unrivaled Condiment having caused certain dealers to apply the name of "Worcestershire Sauce" to their own inferior compounds, the public is hereby informed that the only way to secure the genuine is to ask for LEA & PERRINS' SAUCE, and see that their name are upon the wrapper, labels, stopper and bottle.
Some of the foreign markets having been supplied with a spurious Worcestershire sauce, upon the wrapper and labels of which the names of Lea and Perrins have been forged, L. & P. give notice that they have furnished their correspondents with power of attorney to take instant proceedings against manufacturers and vendors of such, or any other imitations by which their right may be infringed.
Ask for LEA & PERRINS' Sauce, and see name on wrapper, label, bottle and stopper.
Wholesale and for export by the Proprietors, Worcester: Cross & Blackwell, London, &c., &c., and by Grocers and Oilmen universally. 15v24-1f

BAIRD'S
BOOKS
FOR PRACTICAL MEN.

My new revised and enlarged Catalogue of PRACTICAL AND SCIENTIFIC BOOKS, 96 pages, 8vo., will be sent, free of postage, to any one who will favor me with his address.
HENRY OAREY BAIRD,
Industrial Publisher, 406 Walnut St., PHILADELPHIA.
23v25-6m

JUST PUBLISHED.
Froiseth's New Sectional, Topographical and Mineral
MAP OF UTAH.
SIZE, 40 BY 56 INCHES; SCALE, 8 MILES TO AN INCH.

Handsomely engraved on stone, colored in counties, and mounted on cloth, showing the Counties, Towns, Rivers, Lakes, Railroads, Mines and Mining Districts throughout the Territory, and all GOVERNMENT SURVEYS made to date. Price, mounted, \$8; Pocket form, \$5. Mailed to any part of the United States, on receipt of price, by A. L. BANCROFT & CO., 721 Market street, San Francisco, Cal., or by B. A. M. FROISETH, Publisher, Salt Lake City, Utah. 10v25-1f

EUCALYPTUS.
The attention of the Medical profession is respectfully called to the following preparation of this new remedial agent. Eucalyptus and its preparations have been found useful in obstinate cases of intermittent and Malarial fevers, and in supplanting the use of Quinine. The paroxysms of Asthma and Catarrh are greatly controlled, and in various Kidney diseases and Catarrh of the Bladder it seems to act like a specific.

FLUID EXTRACT EUCALYPTUS.
This extract represents in a concentrated form the medicinal effects of the leaves of Eucalyptus Globulus.
THE ELIXIR OF EUCALYPTUS.
This compound presents the properties of the leaves in a palatable form and elegant appearance. Dose—One tablespoonful, to be repeated as often as the case demands.
Characteristics of Eucalyptus Globulus, useful in Asthma, Difficulty of Breathing, Incipient Pleurisy, etc. Prepared and sold by **JAMES G. STEELE & CO.,** Chemists and Apothecaries, No. 521 Montgomery St., between Clay and Commercial, San Francisco. no28

L. SCHUMANN,
PIONEER
Meerscham Pipe Manufacturer,

No. 341 KEARNY STREET,
Between Bush and Pine streets, San Francisco
The first and only Manufacture on the Pacific Coast. MEERSCHAUM MOUNTED WITH SILVER. Meerscham Pipes Bored and Repaired. Amber Mouth-pieces Fitted.

Gold Run Mining Company—Location of works, Nevada Territory, Nevada. Principal place of business, Nevada Territory, Nevada. Notice is hereby given, that at a meeting of the Board of Directors, held on the 14th day of January, 1873, an assessment of twenty-five cents per share was levied upon the capital stock of said company, payable immediately in United States gold coin, to the Secretary, at the office of the Company, No. 419 California street, San Francisco, California. Any stock upon which said assessment shall remain unpaid on the 15th day of March, 1873, shall be deemed delinquent and will be duly advertised for sale at public auction, and unless payment is made before, will be sold on Monday, the 15th day of March, 1873, at 1 o'clock P. M., to pay the delinquent assessment, together with costs of advertising and expenses of sale. By order of the Board of Directors, J. W. COLBURN, Secretary.

And in accordance with law, and an order of the Board of Directors, made on the 30th day of December, 1872, so many shares of each parcel of said stock as may be necessary, will be sold at public auction, at the office of the Company, corner Market and Spear streets, on the twenty-fifth day of February, 1873, at the hour of 12 o'clock M., of said day, to pay said delinquent assessment, together with costs of advertising and expenses of sale.

C. O. PALMER, Secretary.
Office, Corner Market and Spear streets, San Francisco, California. feb-23

Imperatrice Eugenie Gold and Silver Mining Company—Location of principal place of business, San Francisco, California. Location of works, Blue Lake, California. Notice is hereby given, that at a meeting of the Board of Directors, held on the 15th day of February, A. D. 1873, an assessment of five cents per share was levied upon the capital stock of said company, payable immediately in United States gold coin, to the Secretary, at the office of the Company, No. 712 and 714 Washington street, San Francisco, California. Any stock upon which said assessment shall remain unpaid on the 15th day of March, 1873, shall be deemed delinquent and will be duly advertised for sale at public auction, and unless payment is made before, will be sold on Monday, the 15th day of March, 1873, at 1 o'clock P. M., to pay the delinquent assessment, together with costs of advertising and expenses of sale. By order of the Board of Directors, J. W. COLBURN, Secretary.

Office, 712 and 714 Washington street, San Francisco, California. feb-23

Lady Franklin Gold and Silver Mining Company—Principal place of business, city and county of San Francisco, State of California. Location of works, Silver Mountain Mining District, Alpine county, California. Notice is hereby given, that at a meeting of the Board of Directors, held on the 15th day of February, 1873, an assessment of fifty cents per share was levied upon the capital stock of said company, payable immediately in United States gold coin, to the Secretary, at the office of the Company, No. 435 California street, San Francisco, California. Any stock upon which said assessment shall remain unpaid on the 15th day of March, 1873, shall be deemed delinquent and will be duly advertised for sale at public auction, and unless payment is made before, will be sold on Monday, the 15th day of March, 1873, at 1 o'clock P. M., to pay the delinquent assessment, together with costs of advertising and expenses of sale. By order of the Board of Directors, J. W. COLBURN, Secretary.

Office, 507 Montgomery street, San Francisco, California. feb-23

Lemon Mill and Mining Company—Principal place of business, city and county of San Francisco, State of California. Location of works, Eureka Mining District, Land & County, State of Nevada. Notice is hereby given, that at a meeting of the Board of Directors, held on the 12th day of February, 1873, an assessment of one dollar (\$1) per share was levied upon the capital stock of said company, payable immediately in United States gold coin, to the Secretary, at the office of the Company, No. 419 California street, San Francisco, California. Any stock upon which said assessment shall remain unpaid on the 15th day of March, 1873, shall be deemed delinquent and will be duly advertised for sale at public auction, and unless payment is made before, will be sold on Monday, the 15th day of March, 1873, at 1 o'clock P. M., to pay the delinquent assessment, together with costs of advertising and expenses of sale. By order of the Board of Directors, J. W. COLBURN, Secretary.

Office, 608 Merchant street, San Francisco, California. feb-23

Meadow Valley East Extension M. Co.—Location of works, Elko Mining District, Nevada. Notice is hereby given, that at a meeting of the Board of Directors, held on the 14th day of January, 1873, an assessment of one cent per share was levied upon the capital stock of said company, payable immediately in United States gold coin, to the Secretary, at the office of the Company, Room 3, No. 419 California street, San Francisco, California. Any stock upon which said assessment shall remain unpaid on the 15th day of March, 1873, shall be deemed delinquent and will be duly advertised for sale at public auction, and unless payment is made before, will be sold on Monday, the 15th day of March, 1873, at 1 o'clock P. M., to pay the delinquent assessment, together with costs of advertising and expenses of sale. By order of the Board of Directors, J. W. COLBURN, Secretary.

Office, Room 3, 419 California street, San Francisco, California. feb-23

Mohave Consolidated Gold and Silver Mining Company—Location of works, Wallapai Mining District, Mohave County, Arizona Territory. Location of principal place of business, No. 507 Montgomery street, San Francisco, Cal. Notice is hereby given, that at a meeting of the Board of Directors, held on the 14th day of January, 1873, an assessment of one cent per share was levied upon the capital stock of said company, payable immediately in United States gold coin, to the Secretary, at the office of the Company, Room 3, No. 419 California street, San Francisco, California. Any stock upon which said assessment shall remain unpaid on the 15th day of March, 1873, shall be deemed delinquent and will be duly advertised for sale at public auction, and unless payment is made before, will be sold on Monday, the 15th day of March, 1873, at 1 o'clock P. M., to pay the delinquent assessment, together with costs of advertising and expenses of sale. By order of the Board of Directors, J. W. COLBURN, Secretary.

Office, Room 3, 419 California street, San Francisco, California. feb-23

No. 507 Montgomery street, San Francisco, California. feb-23

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ESTABLISHED 1851.

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Steam Engines and Boilers,

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Mining Machinery of Every Description,

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Particular attention paid to Jobbing Work and Repairs.

N. B.—Sole Agents for sale of HUNTOON'S OCEAN-GRATED PATENT GOVERNOR.
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Foundry and Iron Works.

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MANUFACTURERS OF

TEAM ENGINES,

Quartz, Flour and Saw Mills,
New Improved Steam Pump, Brodie's Improved Crasher, Mining Pumps, Amalgamators, and all kinds of Machinery.

N. E. corner of Tehama and Fremont streets, above Howard street, San Francisco. 3-47

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109 and 111 Mission Street,
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These Works have lately been increased, by additional Tools, and we are now able to turn out any kind of work, equal to and cheaper than any establishment in the State; that is to say:—

STEAM ENGINES,

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Printing Presses,

AND MACHINERY MADE OF EVERY DESCRIPTION.

Improved Safety Store Hoists,

Fitted with Cutting's Patent Cams, unequalled for safety, convenience and cheapness. This Hoist can be built for about half the price of any other in use. To be seen at HAWLEY & CO.'S.

ALSO, MANUFACTURER AND SOLE AGENT FOR
Pracy's Celebrated Governor.
TURNING LATHES, Etc., constantly on hand.
4v23tf

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ROOT, NEILSON & CO.,

MANUFACTURERS OF

STEAM ENGINES, BOILERS,
CROSS' PATENT BOILER FEEDER AND SEDIMENT COLLECTOR

Dunbar's Patent Self-Adjusting Steam Piston
PACKING, for new and old Cylinders.

And all kinds of Mining Machinery.
Front Street, between N and O streets,
SACRAMENTO CITY.

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Established for the Manufacture of
RAILROAD AND OTHER IRON
Every Variety of Shafting,
Embracing ALL SIZES of
Steamboat Shafts, Cranks, Pistons and Connecting Rods, Car and Locomotive Axles and Frames

HAMMERED IRON

Of every description and size.

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The highest price paid for Scrap Iron. 9v14s

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PRESCOTT, SCHEIDEL & CO.,

MARYSVILLE FOUNDRY.

Corner of B and Fourth streets, Marysville, Cal.

MANUFACTURERS OF

STEAM ENGINES,

STATIONARY AND PORTABLE

SAW AND GRIST MILLS,

Hydraulic Machinery,

Quartz Crushing and Amalgamating
Machinery

Of every description, constantly on hand.

Plans and estimates furnished upon application. Repairs upon all kinds of Machinery promptly made, and at moderate charges.

Having unrivalled facilities, we are prepared to make to order, at short notice, anything required in our line. Specimens of our work may be seen in all the mining regions on this coast.

THE RISDON

Iron and Locomotive Works.

INCORPORATED.....APRIL 30, 1868.
CAPITAL.....\$1,000,000.

LOCATION OF WORKS:
Corner of Beale and Howard Streets,
SAN FRANCISCO.

Manufacturers of Steam Engines, Quartz and Flour Mill Machinery, Steam Boilers (Marine, Locomotive and Stationary), Marine Engines (High and Low Pressure). All kinds of light and heavy Castings at lowest prices. Cams and Tappets, with chilled faces, guaranteed 40 per cent. more durable than ordinary iron.

Directors: C. J. Ehrenman, O. E. McLane,
Wm. Norris, Wm. H. Taylor, Lloyd Tevis,
James D. Walker.

WM. H. TAYLOR.....President
JOSEPH MOORE.....Vice-President and Superintendent
LEWIS R. MEAD.....Secretary
24v17-0v

OCCIDENTAL FOUNDRY,

187 and 189 First st., near the Gas Works, San Francisco.

STEIGER & BOLAND,

IRON FOUNDERS.

IRON CASTINGS of all descriptions at short notice. All orders punctually executed in time agreed on. Particular attention paid to making superior Shoes and Dies. Among the special castings of this Foundry are the well known CALLAHAN GRATE BAR, of superior merit for burning screenings—all size Bars. STRATTON'S JACK SCREWS, all sizes. Superior, compact and effective Horse Powers, Pumps, Agricultural Castings, Ingot Moulds, Assaying and Refining Retorts and Kettles, and a great variety of other and special castings.

STEIGER & BOLAND Proprietors.

Steiger & Boland are the sole Manufacturers of the Improved Hepburn Roller Pan. The patterns having all the improvements to those Pans, are at the Occidental Foundry, enabling the Establishment to deliver all pans and parts thereof with uniformity, finished in the best style, and at the lowest possible price. Pan Castings furnished the trade, with liberal facilities for erection, &c. All persons are cautioned against making, selling or using these Pans, except through the authorized agents and manufacturers, viz., Steiger & Boland, of the Occidental Foundry, S. F.

22v25-3m WM. H. HEPBURN.

A. HANKE'S

IRON FOUNDRY,

CORNER MAIN AND HARRISON STREETS,

Entrance on Main Street.....San Francisco.

Every Description of Ornamental Work,
Stove and French Range Work, grate and fender work, small machines of all descriptions, house work, etc., promptly attended to.
25v25-3m

CALIFORNIA BRASS FOUNDRY,

No. 125 First street, opposite Minna,
SAN FRANCISCO.

ALL KINDS OF Brass, Composition, Zinc, and Babbitt Metal Castings, Brass Ship Work of all kinds, Spikes, Sheathing Nails, Rudder Braces, Hinges, Ship and Steamboat Bells and Gongs of superior tone. All kinds of Cocks and Valves, Hydraulic Pipes and Nozzles, and Hose Couplings and Connections of all sizes and patterns, furnished with dispatch.
PRICES MODERATE.
J. H. WOOD. C. KINGWELL.

THOMPSON BROTHERS, EUREKA FOUNDRY,

129 and 131 Beale street, between Mission and Howard, San Francisco.

LIGHT AND HEAVY CASTINGS, &
of every description, manufactured, 24v16gr

SELL YOUR PATENTS

Through WIESTER & Co., 17 New Montgomery street, SAN FRANCISCO, CAL.

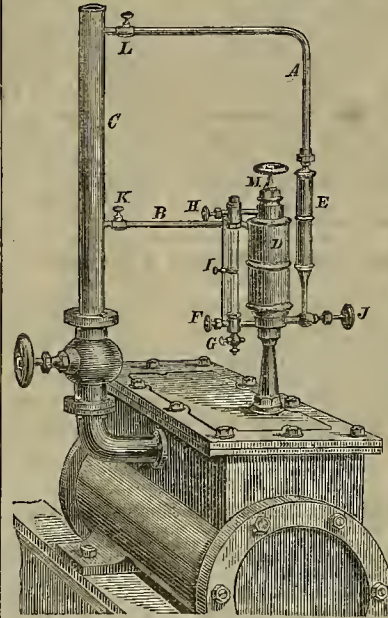
Miners' Foundry and Machine Works,

OO-OPERATIVE,

First Street, bet. Howard and Folsom, SAN FRANCISCO
Machinery and Castings of all kinds.

Machinery.

N. Seibert's Eureka Lubricators.



THE HIGHEST PREMIUM

Awarded by the Mechanics' Institute Fair, San Francisco, and State Fair, Sacramento, 1871.

These Lubricators are acknowledged by all engineers to be superior to any they have ever used; feed constantly by pressure of condensed water, supplied by pipe A, regulated under the oil by valve J, and forced out through check valve and pipe B into the steam pipe C; it then becomes greasy steam, passes to all the valves and cylinder at every stroke of the engine; glass tube I indicates amount used per hour. Packing on rods and stems lasts longer, and the rings on the piston will not corrode. One pint of oil will last from three to six days, according to speed and size of engine; I, sliding gauge; K, valve to shut off when engine stops; H, F, valves to shut off in case of frost; steam does not enter the cup; it is always cool; warranted to give satisfaction. Patented February 14, 1871. Manufactured by California Brass Works, 125 First street, S. F. 24v25tf

POWER, TANTER & CO.,

MANUFACTURERS OF



WOOD-WORKING MACHINERY.

3003 Chestnut street, (West end Chestnut street Bridge)
PHILADELPHIA.
Woodworth Planers a Specialty. 4v25-3m

Notice is hereby given, that the copartnership heretofore existing between A. J. Severance, Charles W. Randall and J. Gus. Burt, under the firm name of "Severance, Holt & Co.," is this day dissolved by mutual consent. A. J. Severance, having purchased all the interest of his late partners, will continue the business of manufacturing and selling Diamond Drills as before, under the style of A. J. Severance & Co. Dated San Francisco, Nov. 24, 1871.
Office, 315 California street. A. J. SEVERANCE,
CHAS. W. RANDALL,
J. GUS. BURT.

22-v23-4f
FARCIOT & VANDRAKE,
GENERAL MACHINISTS,
No. 13 Fremont Street (Nelson & Doble's Building),
San Francisco, Cal.

NOTICE.—Special attention called to our new STEAM PUNCHING PRESS, which we have on hand for use of customers. Capacity, 1800 per hour. All kinds of Dies and Punches made to order. 23v25-3m

THEODORE KALLENBERG, MACHINIST,

and Maker of Models for Inventors. All kinds of Dies Stamps and Punches made. Also, all kinds of Small Gears Cut.
Repairing done on very Reasonable Terms and in the best manner. No. 32 Fremont street, S. F. 19v23-3m

NELSON & DOBLE,

AGENTS FOR

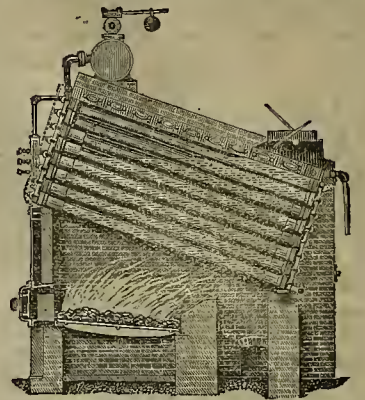
Thomas Firth & Sons' Cast Steel.



MANUFACTURERS OF
Sledges, Hammers, Stone
Cutters', Blacksmiths' and Horse-Shoers' Tools.

18 and 15 Fremont street, near Market, San Francisco 10v14gr

Root's Safety Boilers.



IMPROVED AND PERFECTED

—BY—

FIVE YEARS' EXPERIENCE,

And the Sale of Nearly 800 Boilers,

For all manner of uses.

Send for Circular, and for further information address

L. C. PARKE,
2v25-tf Virginia City, Nevada.

San Francisco Boiler Works,

123 and 125 Beale Street.....SAN FRANCISCO.

F. I. CURRY,

(Late Foreman of the Vulcan Iron Works,) Proprietor.

High and Low Pressure Boilers of all
Descriptions.

SOLE MANUFACTURERS OF THE CELEBRATED

SPIRAL BOILER.

SHEET IRON WORK of every description done at the Shortest Notice.

All kinds of JOBBING and REPAIRING promptly attended to. 17v25-3m

Portland Boiler Works.

MOYNIHAN & AITKEN,

311 and 313 Mission St., San Francisco.

T. J. MOYNIHAN.

J. AITKEN.

High & Low Pressure Boilers

OF ALL KINDS,

Built according to Drawings or Specifications, and SHEET IRON WORK executed at the shortest notice, and on the most reasonable terms.

Repairing promptly attended to, and at reasonable rates.

Agents for Robinson's Government Lock Valve.
4v26-3m

Steam Boiler Manufactory

—OF—

JAMES H. SHANLEY,

(Successor to D. McDonald.)

Oregon street, below Front.....SAN FRANCISCO.

ALL SORTS OF STEAM BOILERS

Made to order and repaired.

Also all kinds of Sheet Iron Work done promptly, and at prices to suit the times. 25v25-3m

From the Mining Summary in the Gold Hill News of December 28th.

The New Root Boiler

IS A PERFECT SUCCESS.

The saving in the amount of fuel consumed, alone amounting to 30 per cent. less than the cost of running the same machinery with the old style of Boilers.

For price list and prompt execution of orders please address

WM. HOLDREDGE,
137 Montgomery street, San Francisco,
2v26-3m General Agent for the Pacific Coast.

McAFEE, SPIERS & CO.,

BOILER MAKERS

AND GENERAL MACHINISTS,

Howard st., between Fremont and Beale, San Francisco.

Charles Brown, Dealer in Ranges, Stoves, Tinware, and all kinds of Kitchen Utensils, Metal Roofing, Tin, Copper, and Sheet-iron work. Chimney Tops put up, and warranted. 724 Market street, S. F.

BURLEIGH ROCK DRILLS

—AND—
Air Compressors.

The Burleigh Rock Drills, which have stood the test of five years' constant use at the Hoosac Tunnel, and which are now in use in nearly every State in the Union, as well as in Europe and South America, are unequalled in efficiency and economy by any other Drilling Machine. They are of various sizes, and equally well adapted to Tunneling, Shafting, Open Cut or Quarrying, and will drill six to ten inches per minute in granite. They are driven by steam above ground. The Burleigh Air Compressor is the best engine yet devised for furnishing the "air motor" for the many purposes to which it is now being used.

They are to be used on the St. Gothard Tunnel, Switzerland; Tunnel 13 miles long. We refer to the following gentlemen and works:

Gen. Newton, U. S. A. Hell Gate Tunnel, L. I.
Messrs. Shant-Y. Hoosac Tunnel, Mass.
J. Dutton Steele. Nesquehoning Tunnel, Pa.
Sidney Dillon. Fourth Avenue Work, N. Y.
Col. Roebbling. East River Bridge Company, N. Y.

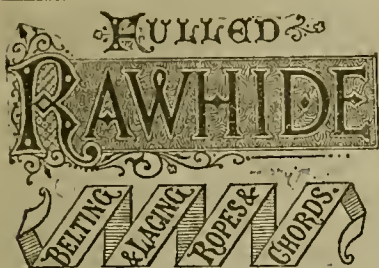
For further information, etc., address

L. C. PARKE,

VIRGINIA CITY, NEVADA.

AGENT FOR THE PACIFIC COAST.

115



194-2am-bp

Frear Artificial Stone.

THE ONLY SUCCESSFUL PATENT.

Beautiful, Cheap and Durable!

County Rights for Sale.

Address, R. WEGENER, Sec'y

FREAR STONE COMPANY, SAN FRANCISCO.

7v25-1f

J. W. Farren,

Wagon Maker and Blacksmith,

131 Beale St., between Mission and Howard,

SAN FRANCISCO.

Wagons, Trucks and Carts of every description manufactured to order on the shortest notice. Repairing of all kinds promptly attended to and all work guaranteed to give satisfaction.

4v26-3m

Attention, Owners of Horses.



The Zinc Collar Pad is guaranteed to cure the worst cases of raw and inflamed sore neck in Ten Days, and work the horse every day, or money refunded; and will not chafe or wear the mane off of the neck. For sale by Saddlery, Hardware, Saddlery and Harness Makers. Manufactured by the Zinc Collar Pad Co., Buchanan, Mich.

fe8-1f

Betts's Capsule Patents.

To prevent infringements, notice is hereby given, that Betts's name is on every Capsule he makes for the principal merchants in England and France, and that no one is to identify the genuineness of the capsule, but likewise the contents of the vessel to which it is applied. The L'ORD CHANCELLOR, in his judgment, said that the capsules are not used merely for the purpose of the ornament, but that they are serviceable in protecting the wine from injury, and insuring its genuineness.

MANUFACTURERS:—1, WHARF-ROAD, CATT-ROAD, LONDON, AND BORDAUX, FRANCE.

Agents Wanted for the New Book,

Underground Treasures—How and Where to Find Them,

A KEY FOR THE READY DETERMINATION

Of all the Useful Minerals within the United States.

BY JAMES ORTON, A. M.

A work of rare value to every person, and worth ten times its cost. Price only \$1.50. Send for full descriptive circular to

F. DEWING & CO.,

2v5-bptf 542 California street, San Francisco.

5,000 AGENTS WANTED.—Samples sent free by mail, with terms to clear from \$5 to \$10 per day. Two entirely new articles, saleable as flour. Address N. H. WHITE, Newark, N. J.

fe8-1m

BUY BARBER'S BIT BRAOE.

FISHER'S KNUCKLE JOINT AND NOZZLE

IS THE
Cheapest and Best
Hydraulic Machine
in use.

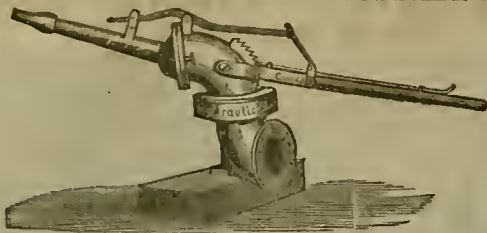
The only reliable party in the Hydraulic business who protects his patrons.

9v23-1f

Address F. H. FISHER, Nevada, Cal.

HYDRAULIC MINERS, TAKE NOTICE—I hereby caution Miners and Manufacturers against making, buying, selling or using a Hydraulic Machine or Joint known as the Little Giant, manufactured and sold by R. R. & J. Craig and Richard Hoskin, as the same is an infringement upon the invention of the machine known as FISHER'S HYDRAULIC CHIEF, secured by Letters Patent, No. 110,222, dated Dec. 20, 1870. All parties participating in such infringements will be rigorously prosecuted. Nevada, Jan. 13th.

HYDRAULIC CHIEF.



MAOHINES
Manufactured
TO ORDER,
to throw from
One
to an
eight-inch
STREAM.

CAMERON'S

MINING STEAM PUMPS.

DAVID STODDART,

114 Beale Street,

SAN FRANCISCO.



THE LIGHTNING MILL.

THE LIGHTNING MILL

For Pulverizing Quartz,

"Charleston Rock," and all Native Phosphates, Flint, Feldspar, Iron Ore, Manganese, Antimony, Carbon, Corundum, Old Crucibles, Barytes, Brimstone, Slate, Soapstone, Graphite, Glass, Marble, Plaster, Anthracite and Bituminous Coals, etc.

WM. STEWART'S

Patent Bone Mills and
Crushers.

For Grinding Bones, Rock, Quartz, and all hard substances; also, Corn, Wheat, Oats, Barley, Coffee, Spices, etc.

WALKER BROS. & CO., Twenty-third and Wood Streets, Philadelphia, Sole Manufacturers of Stewart's Celebrated Patent Bone Mills and Crushers, A. W. Straub & Co.'s Patent Revolution French Burr Mill and A. Duval's Patent Centrifugal Pumps.

FRIEL'S PARAGON VAPOR STOVE.

PATENT APPLIED FOR.

The Great Labor Saver of the Household.

ECONOMY, CONVENIENCE AND SAFETY COMBINED.

JUST THINK OF IT—No Wood, no Coal, no Gas, no Stove Pipe, no Chimney, no Smoke, no Ashes, no Dirt, no Wood Boxes, no Coal Scuttles, no Kindling Wood, but a Friction Match, and the Fire in Full Blast in Half a Minute!

OVEN HOT IN TWO MINUTES.

Steak broiled in seven minutes! Baked Hens in thirty minutes! The fire extinguished in a moment! And the house unheated! It has no rival in all kinds of Cooking and Flat Iron Heating, and combines Economy, Convenience, Neatness, Safety and Durability! The Ladies Welcome it; a little CHILD can operate it, and



ALL RECOMMEND IT.

Prices from \$6 to \$25, according to size.

Manufactured and sold by

WM. FRIEL,

69 and 71 Fourth Street, San Francisco.

d25 v25-3m

California File Manuf'g Co.

Potrero, Solano street, bet. Tennessee and Minnesota streets, SAN FRANCISCO.

Manufacturers of New Files.

Old Files re-cut and warranted equal to new.

REAPER AND MOWER SECTIONS, BARS AND KNIVES COMPLETE, at a saving of 50 per cent. Orders from the country promptly attended to.

9v19-hy

\$1,000 REWARD! For any case of Blind, Bleeding, Itching, or Ulcerated Piles that De Bings' Pile Remedy fails to cure. It is prepared expressly to cure the Piles and nothing else. Sold by

O. F. RICHARDS & Co., Agents, corner Clay and Sanson streets, San Francisco, Cal.

The California Powder Works

No. 314 CALIFORNIA STREET.

SAN FRANCISCO.

Manufacturers and have constantly on hand

SPORTING,

MINING,

And BLASTING
POWDER,

OF SUPERIOR QUALITY, FRESH FROM THE MILLS. It being constantly received and transported into the interior, is delivered to the consumer within a few days of the time of its manufacture, and is in every way superior to any other Powder in Market.

We have been awarded successively

Three Gold Medals

By the MECHANICS' INSTITUTE and the STATE AGRICULTURAL SOCIETY for the superiority of our products over all others.

We also call attention to our

HERCULES POWDER.

Which combines all the force of other strong explosive now in use, and the lifting force of the best blasting powder, thus making it vastly superior to any other compound now in use.

A circular containing a full description of this Powder can be obtained on application to our Office.

16v20-3m

JOHN F. LOHSE, Secretary.

SAN FRANCISCO

SCREW BOLT WORKS,

PHELPS BROTHERS, Proprietors

MANUFACTURERS OF ALL KINDS OF

Machine Bolts, Bridge Bolts, and Ship or Band Bolts.

13 and 15 Drumm Street, San Francisco. 4v24ly

J. M. STOCKMAN,

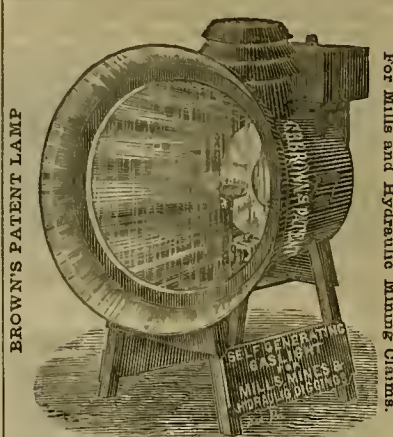
Manufacturer of

PATTERNS AND MODELS,
(Over W. T. Garratt's Brass Foundry).

N. W. corner Natoms and Fremont streets, S. F. Entrance on Natoms street.

6v23-3m

BROWN'S PATENT LAMP.



For Mills and Hydraulic Mining Claims.

One of these Lamps, when placed at a distance of 200 feet from the bank, will light up a bank surface 250 feet in length and 150 feet high, and to a much better advantage than any other light heretofore tried, and at an expense not to exceed five cents per hour. Lamps furnished at short notice.

[Letter of Recommendation.

Mr. C. B. Brown—Sir: Your Patent Lamp for lighting hydraulic mines, which you sold to me in December last, has given entire satisfaction, and far exceeds my expectations, and I think it the best and cheapest light ever used to light mining claims by night, and am satisfied that I have saved three hundred dollars by the use of it in the last mining season over pitch or any other light of the same brilliancy; and I will also say that if I could not get another lamp, five hundred dollars would not buy it. Yours,

W. D. APLIN.

Little York, Nov. 5, 1872.

For further particulars, address,

1c22-2t C. B. BROWN, Placerville, Cal.

BLACK DIAMOND FILE WORKS.



G. & H. BARNETT,

Manufacturers of Files of every Description

Nos. 39, 41 and 43 Richmond street,

Philadelphia, Pa.

MILL SAW FILES A SPECIALTY.

18v25-ly

SHEET IRON PIPE.

THE

Risdon Iron and Locomotive Works

Corner Howard and Beale Streets,

Are prepared to make SHEET IRON and ASPHALTUM PIPE, of any size and for any pressure, and contract to lay the same where wanted, guaranteeing a perfect working pipe with the least amount of material.

Standard sizes of railroad Car Wheels, with special patterns for Mining Cars. These small wheels are made of the best Car Wheel Iron, properly chilled, and can be fitted up with the improved axle and box—introduced by this company, and guaranteed to outlast any other wheels made in this State.

All kinds of Machinery made and repaired.

24v22-3m JOSEPH MOORE, Superintendent.

WARNER & SILSBY

Manufacture all sizes of

Bed and Sofa Springs,

Which they offer to the trade at reduced prices; also the celebrated OBERMANN Self Fastening Bed Spring.



Any man can make his own Spring Bed with them by attaching them to the slats of any bedstead.

No. 147 New Montgomery Street, corner of Natoma, San Francisco. 23v3-6m

OAKEY & SON'S EMERY AND BLACK

LEAD MILLS, Blackfriars Road, London, England.

OAKEY'S WELLINGTON KNIFE POLISH.

Packets, 3d. each; tins, 6d., 1s., 2s., 6d., and 4s. each.

OAKEY'S INDIA RUBBER KNIFE

Boards from 1s. 6d. each.

OAKEY'S SILVERSMITHS' SOAP (NON

MERCURIAL), for Cleansing and Polishing Silver, Electroplate, Plate-glass, Marble, etc. Tablets, 6d. each.

OAKEY'S GENUINE EMERY, GRAIN

AND FLOUR.

OAKEY'S EMERY AND GLASS CLOTH.

OAKEY'S CABINET GLASS PAPER,

BLACK LEAD, etc.

OAKEY'S GOODS SOLD EVERYWHERE

by Ironmongers, Grocers, Oilmen, Brushmakers, Drugists, etc.

21v25-ly

NARROW GAUGE FOR THE

Denver Rail.

APPLY TO

PORTER, DONALDSON & CO.,

Corner Sansome and Halleck streets, SAN FRANCISCO.

1c1-1m

JOS. THORNHILL, C. W. WHITE,

1612 Mason Street, near Green. 47 Clay Street.

JOS. THORNHILL,

Bricklayer and Contractor

Particular attention paid to all kinds of FIRE WORK, such as BOILERS, FURNACES, OVENS, GRATES, RANGES, etc.

4 05 and 5 30 p. m. * Except Sundays.
T. H. GOODMAN, A. N. TOWNE,

MINING AND SCIENTIFIC PRESS

An Illustrated Journal of Mining, Popular Science and Progressive Industry.

BY DEWEY & CO.,
Patent Solicitors.

SAN FRANCISCO, SATURDAY, MARCH 1, 1873.

VOLUME XXVI.
Number 9.

Improved Forms of Rock Drill Points.

Written for MINING AND SCIENTIFIC PRESS by A. Blatchley.

There are few branches of mining which are not more indebted to modern science than Rock Drilling. The holes in the rock in mining and quarrying are beaten by blows of the hand in the same manner that the builders of the Pyramids wrought three or four or more thousand years ago. Whether they used the same form of drill point that we do, is uncertain, but it is probable that they did. We probably have better steel than they, but that is the only point whereby we surpass them. After the holes are drilled, we have in gunpowder and other explosives a means of rapidly tearing rock, which they did not possess.

In our cuts we have not shown the diamond drill point which is a section of a cylinder with diamonds set on its face, so that revolving the cylinder grinds out the hole. Or the diamonds are set in, in the end of a pipe, and when the pipe is revolved under heavy pressure, the diamonds wear away the rock and make a hole with a core in the center.

The use of diamonds is very limited and the supply small when compared to steel, and if all the rock work that is done by steel in one year were done by diamonds, all the known diamonds both carbons and brilliants would be required. The few required to supply rock drills have caused an advance in the price in the last three years of several hundred per cent., even the fabulous Arizona diamond yield of the fields failing to keep down the price.

In our engraving No. 1 represents what is called the diamond or lozenge-shaped point. It is the almost universal form used in drilling metals and is largely employed in rock drilling. Its sharp point is particularly useful in starting a hole in any given point; and in soft rock it is as efficient as one with a rounder form. No. 2 shows a form that is better adapted to harder rock, but No. 3 is the form most commonly prepared for the hardest rock, such as granite, mica slate, containing a large amount of siliceous matter, mica, etc., and amygdaloid, etc.

Figures 7 and 8 (the same figures though different views of the same drill) represent the cross and three-leaved point, and sometimes as many as seven leaves are used. Figure 7 shows an end view of the drill. The cross is generally adapted for machine drills and will sustain a heavier blow without breaking than a chisel point. All of these cut out the entire size of the hole as is shown at No. 6, which shows the form of the cuts at the bottom of the hole. No. 4 shows a double drill, (front and side view) two obisel points with the edges set parallel; 4 shows the manner in which it operates. It cuts around on the sides of the hole and the center flakes off, thus saving a large amount of cutting in drilling a hole.

This ingenious arrangement was invented by Charles Braid of Copperopolis, twelve or fourteen years ago. No. 5 represents a side and front view of a modification of this drill; the cutting edges are rounded so as to conform to this side of the hole as is shown at Fig. 5. This cuts a still smaller portion of rock as is shown at Fig. 5. This form of drill bores a hole with less expenditure of power than any other known form; the chips are larger, showing less cutting than when they are finer.

No. 6 represents a curious form which is sometimes used for leaving a center for holding a tool for chamfering out this pattern of a hole. One of the greatest improvements in blasting rocks, that has been made in later times, is the use of Giant Powder. By its great explosive force as much execution can be done with an inch and a quarter hole as by an inch and a half charged with ordinary gunpowder, reducing the work of drilling as eleven to seven, and one man with a hand hammer and a small drill can penetrate this rock nearly as fast as two men with a larger drill.

SOUTH AMERICAN MINES.—The yield of the silver mines at Corraoee near the boundary line between Chile and Bolivia, is about \$250,000 per month.

A New Style of Pavement.

The San Francisco Paving Company was incorporated in this city December 24th, 1872, the object being to produce a cobble pavement, which, while retaining the durability of the ancient cobble, presents a smooth and level surface for carriage traffic. This the above named company have undoubtedly accomplished, by the following method, viz: The cobbles, which are procured of as nearly a uniform size as possible, are fed with mathematical precision to a machine which cuts or clips one of the rounded ends of the stone, producing



AN IMPROVED PAVEMENT.

a level surface instead of a spherical one, which level surface the proprietors say they have every reason to believe will be permanent.

The advantages of this pavement over the cobble now in use is at once apparent by reference to the accompanying cut. In muddy weather no one with a humane heart can travel

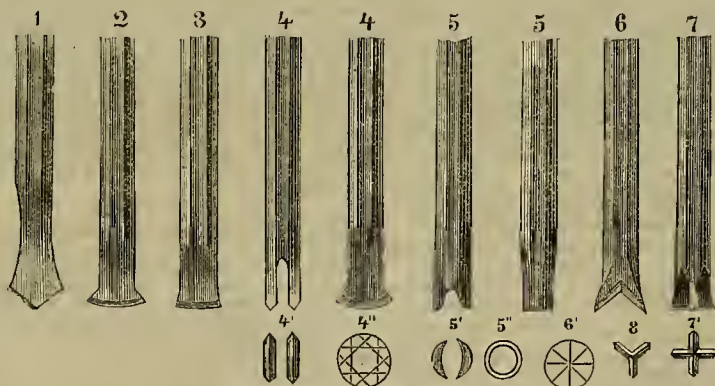
New Zealand Mining Affairs.

The files of the papers which came to hand by the "Nevada," report considerable progress in mining affairs in New Zealand. The gold fields show many indications of paying as well as they formerly did and numbers of claims supposed to be worked out, are showing freely. Capital is being invested in machinery, tramways and other appliances of mining operations, and there seems to be a desire to put money in legitimate mining property rather than in shares.

A quicksilver mine at the Bay of Islands has

been leased from the natives for 99 years on consideration that the holders pay 25 per cent. of the profits from the sale of quicksilver to the natives. There are about 3,000 acres of mining ground.

The settlers there have had a little more enterprise in one respect than we have shown



DIFFERENT FORMS OF DRILL POINTS.

the streets of San Francisco without suffering a pang for the poor horse, who often drawing heavy loads, struggle and slide over the slippery cobble stones to the great detriment of their feet and limbs. Possessors of valuable horses, omnibus companies, and in fact all owners of equines will view the above method of paving with sincere favor, and it is to be hoped that our Board of Supervisors will carefully inspect these stones, before authorizing any more contracts. The officers of the company are Louis Duterhric, President; E. D. Sawyer, Treasurer and A. E. Ball Secretary.

The machine for clipping the stones is being built by Messrs. Martin & Co., and is now about completed.

MEXICAN MINES.—Rich gold and silver mines have recently been discovered in the Sierra de San Juan District of the State of Tamaulipas, Mexico. The latest reports from Tantima, Real del Norte, Gnanaxtato and Zacoatecas are favorable, and the production of silver the ensuing year is expected to be much greater than ever before. At the same time the high price of quicksilver will prevent the working of poor ores.

here in San Francisco. They have large and apparently inexhaustible deposits of titaniferous iron sand which is now being converted into iron and steel. An experiment was recently tried with 480 pounds of iron sand, which was placed in a furnace and left for two hours; at the end of that time the sand liquefied and the iron was pronounced to be of the first quality. It is understood that we have on this Coast extensive deposits of magnetic iron sand, but as scarce as iron is here we have made no effort as yet to utilize the product. The high price of fuel is probably the cause why nothing has been done with it here, but as far we know, no practical experiments have been made to determine its commercial value.

The New Zealand sand has previously been subjected to tests in England and is said to make first-rate iron. The large deposit in Canada has also been worked to some extent.

LARGE TUNNEL.—The Jamez River and Kanawha canal which is partially completed, is to pass under the Alleghany Mountains, through a tunnel eight miles in length. The work will cost about \$75,000,000 to complete.

Grindstones.

That a rapid advance has been made during the past few years in mechanic arts on the Pacific Coast, is evident from even a casual visit to the numerous and well appointed machine shops and mills in this city. Nevertheless there are specialties in mechanics in the Eastern States which have not as yet reached our comparatively distant shores, or which being known are not yet adopted. This is particularly noticeable in the varied and important uses to which grindstones are now put. Formerly their work was confined to the sharpening of tools only, but this is now but a small part of the uses to which they are put, as it has been found by experience that almost every kind of steel, iron (case hardened especially) and brass work used in finished machines can be ground better and cheaper than by filing. Almost every part of a locomotive engine is now finished on the grindstone, which leaves the metal in the best possible condition to receive the polish or paint in finishing. As will be seen by reference to our advertising columns, grindstones of special character are made for special trades, and those for grinding locomotive and machine work are particularly referred to.

Messrs. M. Baird & Co., of the Baldwin Works, Philadelphia, who are now making 40 locomotives a month, keep six grindstones of 4,000 pounds each running constantly on locomotive work alone, not only all the rough castings being ground, but 41 working parts of the engine are finished in this way, besides grinding off the faces of their axils, some of them weighing 700 pounds. The master machinists of nearly all the railway repair shops find it to their interest to keep at least one grindstone in use for this purpose.

Grindstones are also used in the East for finishing pulleys of all sizes. The pulley is caused to revolve against the stone which runs rapidly in an opposite direction, thus grinding down the face of the pulley very fast, and at less cost than by turning it in a lathe, besides leaving it perfectly true. It requires, however, a very peculiar kind of of grindstone for these purposes, the grit of which should be very sharp and firm, so as not to crush down with the necessary pressure, and yet not so hard as to glaze, and it requires considerable care and experience in making a proper selection.

Much more care than formerly is now exercised in the selection of suitable grits for sharpening machinists' tools, and it has been found that the first cost of a grindstone is of little consequence, provided it does its work quickly and well, a poor grindstone being dear at any price. The following hints have been found useful to those having charge of grindstones:

- 1st. Don't waste the stone by running it in water, but if so, don't allow it to stand in water when not in use, as this will cause a soft place.
- 2d. Wet the stone by dropping water on it from a pot suspended above the stone, and stop off the water when not in use.
- 3d. Don't allow the stone to get out of order, but keep it perfectly round by the use of a piece of gas pipe or a barker.
- 4th. Clean off all greasy tools before sharpening, as grease or oil destroys the grit.
- 5th. When you get a stone that suits your purpose, send a sample of the grit to the manufacturer to select by; a half ounce sample is enough and can be sent in a letter by mail.

WASTE.—In one department of the Vienna Exhibition there are to be shown products now obtained from substances which at the time of the London Exhibition of 1851 were wasted.

CORRESPONDENCE.

White Pine Mines.

(Written for the MINING AND SCIENTIFIC PRESS.)

EDITORS PRESS:—The total destruction of the International mill in August last, was a serious, though temporary blow to this mining interest of this district. Fortunately it occurred at a time when the company's mines were in a better condition, and yielding richer ore than at any time during the past two years; and could suitable milling facilities have been procured, work in the mines would have progressed as usual. As it was, no suitable mill could be procured and the company was obliged to suspend operations in their mines for a time, thereby throwing 200 men out of employment just at the most inclement season of the year. And to make matters worse all the large companies in the district followed suit by reducing their working forces to the lowest possible standards, retaining only a prospecting force or from 4 to 8 men. So that on the commencement of the present year there was not over 50 miners employed in the whole district.

At the present time, however, the prospect has somewhat improved with fair

Indications of a Prosperous Season

The coming summer. The Eberhardt and Aurora Co. have secured a lease of the Stanford mill for six months, and have resumed work in their mines with the usual force. The mill is situated close to the tramway so that they can deliver their ore at the mill regardless of the severe storms and drifting snows which have rendered the roads impassable ever since the new year. Several of the mines in which work has been continued have improved greatly since the commencement of the year, both in the quantity and quality of the ore exposed. Some preparatory work is being done in the 'Base Range' with a view to making another effort during the coming summer to inaugurate successful smelting.

The New Railroad.

But most important to the mining interest of this community is the promised early completion of the E. N. N. G. R. R. Cheap and quick transportation is the great desideratum for the whole of the Eastern Nevada mining region. Its influence would be felt in the stimulation of all kinds of mining to increased activity, but more particularly would those districts be benefited whose resources consist wholly or in part of the so-called base ores, such as the extensive 'Base Range' of this district, all of Robinson with its monster deposits, and a host of other localities. Cheap transportation, by opening a way to a market for the produce of the inexhaustible stores of argentiferous lead ore now lying idle, would double the bullion product of the State in a very few years.

The Bullion Product

Of the district owing to the destruction of the International mill and other causes has fallen \$500,000 short of the usual yield, reaching for the year only the meagre sum of \$860,541. The whole amount of free milling ore produced in the district since its discovery, is 161,271 tons, which gave a gross bullion yield of \$7,864,632 or about \$43 per ton. To this may be added 10,442 tons of smelting ore that sold on the dump at an average price of \$14.50 per ton, and produced lead bullion worth \$443,685, making the whole bullion product of the district to date \$8,308,377, a fair showing for a district that has not a single mine opened to a depth of 200 feet from the surface.

The Mines.

The Ward Beecher and Aurora North are the property of the Eberhardt and Aurora Con. Co. They have been worked extensively since the commencement of 1870, and have yielded in that time about \$1,500,000. Their present appearance is such as to warrant the expectation of an increased yield for some time to come. The old ore deposits still continue to yield about fifty tons of ore per day; with no evidence of being soon exhausted. Since the resumption of work, two new deposits of excellent ore have been developed at a greater depth than any heretofore found on Treasure Hill. The first of these was found under the old chamber south of the engine shaft, and is probably a continuation of the ore worked above. It is to all appearance extensive, and as rich as any heretofore found in the mine. The other end most important deposit was found in the south part of the mine, near the South Aurora line. The upper tunnel of the South Aurora has been extended north, under the old chambers in the North Aurora, without finding any indications that the surface deposits continued in depth. Since resuming work a winze has been sunk from the end of this tunnel, and at a depth of twenty feet an entirely new deposit of ore was found. The winze is already in eight feet of the richest kind of chloride ore, without finding bottom. Both of these deposits are over two hundred feet from the surface. This Company has been singularly fortunate in always finding new deposits before the old ones are exhausted; it may be attributed to blind luck, but perhaps more reasonably to skill acquired by long experience, backed by plenty of cash for dead work.

The Edgar Mine.

This mine is a part of Ward Beecher Consolidated, and is situated next north of the last-named. It is on the line of the main north-and-south ore channel, and from every indication all it requires to make it as good a piece of property as any in the district, is good management, backed by a little more vigorous prospecting than it has heretofore had. A large deposit of excellent milling ore has lately been discovered 160 feet from the surface, and thirty feet below the old works.

The Original Hidden Treasure

Was the first free metal mine found on Treasure Hill. It is apparently situated to the east of the main ore channel, but still contained large deposits of good ore, and was for a long time a favorite with local stock speculators; but it appears to have fallen into disfavor lately, and not without good cause. The surface deposits have been completely worked out, and its future depends altogether on what may be found in the deep workings. The prospects are anything but encouraging, still the Wheeler tunnel may find something valuable, should it be continued far enough west to strike the main ore channel.

The Mammoth and Noonday each work a small force, and take out some good ore.

Treasure City, Feb. 10th, 1873. A. J. B.

Resources of Utah—Some of the Principal Mines.—Continued.

The Mountain Lion Mine.

Situated on the summit of Lion Hill, East Cañon, Ophir District, discovered in the fall of 1870. The principal owners is Mr. Ormus Bates, of Ophir.

This mine has been opened more to prove its extent than for the extraction of ore, while much dead work has been done on account of tracing out "jumpers," who took up locations around when the value of the property was established. Notwithstanding the above disadvantage, large open cuts, shafts, dips, etc. have been made, and immense bodies of ore exposed, extracted and sold; and the fact has been established that this mine has a perfect and inconvertible title, and will embrace, when further developments are made, several mines in the vicinity which are located on the course of its vein. It can already trace the Blue Wing, Webster, Defence, Sunnyside and others upon the same vein of mineral. In support of the value of the property, we are credibly informed that one of the original locators sold to Mr. Ormus Bates 200 feet in the fall of 1871 for the sum of \$20,000 gold coin. Also, that in the month of April, 1871, Mr. Q. A. McConnell, then of the U. M. & S. Co., bought and shipped 20 tons of ore from the owners of this mine to Swansea, England, for which the owners received \$4,000 net. This was at that time considered a fair average of the value of the ore. The average width of the vein is estimated at about six feet, and the average assay value is about \$150 per ton; also assays were given as high as \$4,000 to the ton. Numerous pockets of horn-silver have been met with in the course of developing the mine. It is considered that, so far as worked, the mine has paid for itself. The general character of the ore is carbonates and sulphurets, with a very small percentage of lead.

The Miner's Delight, or the Blue Monster Consolidation.

Located on Ophir Hill, East Cañon, consists of the following series of mines, Blue Monster, (the oldest title,) Velocipede Nos. 1 and 2, Silver Shield and Pocahontas. The Blue Monster was discovered July 4th, 1870, and the Miner's Delight July 28th, 1870, and the others at subsequent dates. The mines are owned and are being worked by an English Company.

By the statement of the resident manager, S. Blackwell, Esq., dated March 1872, \$1,000,000 worth of ore was then in sight. The assay value of the ore was \$116 in silver, 52 per cent. of lead and \$5 of gold per ton. The character of the ore is carbonated. It can be smelted without fluxes and worked with little or no blasting. While developing the Silver Shield and Velocipede, fifteen hundred tons were extracted and sold, which assayed \$50 in silver and 45 per cent. lead to the ton. There are five tunnels, five shafts, and numerous drifts, which, passing as they do sectionally and longitudinally through the vein, would, if in a continuous line, extend over ten thousand linear feet. There is on the dumps of the different mines about four thousand tons of ore, which is being held until the erection of patent machinery designed and experimented upon by Capt. Selwyn, R. N. It is expected that in the spring, active operations will commence to develop this valuable property, as the obstacles that have heretofore impeded the work are in a fair way to be removed.

The Panaca Mine

Is situated in Mineral Fork, Big Cottonwood Mining District, and is at present receiving much attention. It is on the ridge or divide between Bear and Mineral Fork gulches, and is opened by a shaft on the ridge and a tunnel on either side of the mountain, which exposes the vein and shows a sectional width of high grade mineral four feet in thickness. The vein is

traceable on the surface up and down the hill for a distance of fifteen hundred feet, which proves it to be a fissure vein. By triangular calculations from workings on the vein, where exposed, it is estimated that \$300,000 of ore is ready for immediate extraction. The owners are perfecting arrangements for active operations in the spring.

The Chicago Mine

Is situated on Hidden Treasure Hill, Dry Cañon, Ophir District, at an altitude of nine thousand feet above the level of this sea.

Work on this mine commenced in the summer of 1871. The mine is owned by Wm. S. Godbe, Esq., of Salt Lake City. The extent of the claim is 2,000 linear feet. The main incline is down 250 feet. At the depth of 240 feet two drifts, 50 feet in length, have been run at right angles with the incline. The pitch of the incline is about 40 degrees in a northwesterly direction. Incline No. 2 is 80 feet deep, having an average angle of from 40 degrees to 45 degrees, and is connected with the main incline of that depth. Incline No. 3 is 30 to 35 feet deep. It has the same angles as No. 2, and connects with it at the above named depth. Incline No. 4, or "Rembler," is between 40 and 45 feet deep, but is not yet connected with the ore. All these developments are westerly of the main incline. Incline No. 1 easterly is about 20 feet deep. Incline No. 2 easterly is down about the same depth. Some 500 tons of ore were taken out of the mine during the year 1872. The average assay value is 50 oz. in silver and 40 per cent. lead. The formation is limestone in strata, between which the vein occurs. The character of ore is carbonates of lead mixed with galena. The vein averages from 5 to 25 feet in thickness. The works and buildings connected with the mine are very substantial, extensive and well arranged for doing a large business. They consist of a large dump house, the wall of which is of dry rock 75 ft. long by 25 ft. high, affording dump room of the capacity of 75x50 feet. The whim and blacksmith's shop are under cover at the mouth of incline No. 1. There is a stone powder house, log stable with six stalls, an office, store-room, cook house and large log house for the accommodation of 30 workmen.

This chute is 130 feet long, 18 inches high and two feet wide, made of two-inch lumber and lined with heavy sheet iron. The ore is passed from the mine down the chute into a log ore house capable of holding two hundred tons. With the present appliances thirty tons of ore can be taken out of the mine in every twenty-four hours.

A roadway a quarter of a mile in length connects the mine with the Fourth of July mine tramway.

The Kelsey Tunnel

Mining Company's locations, owned by Kelsey, Shearman and some New York capitalists, in Bingham Cañon, are situated on the same ridge as the great Winnamuck Mine, and only 2,800 feet distant therefrom. The claim comprises a tunnel site and ten valuable mineral veins, aggregating over twenty thousand feet of mining ground. The Kelsey Tunnel has been run into the base of this ridge for the distance of three hundred and thirty feet, cutting across two very large veins of mineral. The vein upon which the Winnamuck Mine is located undoubtedly runs through the ridge penetrated by this tunnel, and it is believed by the proprietors that they will have but little further to run their tunnel, before they will tap that great mineral vein. The Bingham railroad runs within two hundred feet of the face of this tunnel.

The New York Tunnel,

Owned by Messrs. Kelsey & Shearman, will tap a very large belt of well-known mineral veins at great depths, and furnish a constant drainage to a large amount of very valuable mining ground. The mouth of the tunnel is within five hundred yards of the line of the railroad in Bingham Cañon, and is of easy access by a good road already made.

Vespasian Hill.

Messrs. Kelsey & Shearman also own sixteen parallel veins on this hill, at the head of Markham's Fork of Bingham Cañon, distant one and one-half miles from the line of the railroad. This group of mines aggregate nearly forty thousand feet of mining ground. The Vespasian mine—the middle vein of the group—has been worked by an incline shaft to the depth of 308 feet, developing a fine body of mineral that ranges in assay value from \$14 to over \$1,600 per ton in silver, and from ten per cent. to seventy per cent. in lead. This mineral vein has been opened by shafts of limited depth for a distance of 1,500 feet along the surface, showing everywhere an even out-crop of over three feet in thickness. About one hundred tons of mineral is on the dump of this mine that will average near one hundred dollars per ton in silver and twenty per cent. in lead.

The Agnes Mine

Owned by Mr. Kelsey, Shearman, Godby & Chelerson, is a very fine prospect. A shaft fifteen feet in depth has been sunk on the vein—showing a three feet crevice—the half of which is filled with ore averaging 33 per cent. in lead and \$265 per ton in silver, the balance of the vein being filled with quartz, assaying \$12.50 per ton in silver. This valuable prospect is situated near the divide between Little Cottonwood fork of Bingham Cañon and the head of Pine Canon, Tooele county, and accessible by wagon road. Messrs. Kelsey & Shearman, also own many other excellent prospects, chief of which, are the Blackbad and James in Carr

fork, the Red Cloud, in the vicinity of Yoeemits mine, the Scarborough, near Black Jack Gulch, the C. A. Dene, near the Agnes, the Herry Clews Prntice, in Freeman's Gulch, and the Ella et the head of the Merken—all of which yield very fine surface assays.—Salt Lake Tribune.

The Mineral Belt of Colorado.

It can be stated without fear of contradiction now, that explorations have been made very generally along the main range, its spurs and foot-hills on either side in Colorado, that the mineral belt of the Territory extends from its northern to its southern boundaries over an extent of Territory at least fifty miles in width. To arrive at some idea of the vast area embraced within these limits, we must consider that the Main Range in Colorado owing to its tortuous course is at least five hundred miles in length. This with its breadth of fifty miles shows the mineral belt in Colorado to contain 25,000 square miles, or 16,000,000 square acres. And already prospectors have explored this immense tract sufficiently to fully demonstrate the existence of the precious metals through its entire extent. Of course at this early day in the history of mining industries in the Territory, there has not been actual operations which have fully proven the continuity of ore deposits from the discoveries at the head of North Park, to these on the Rio Grande on our southern boundaries, still wherever explorations have been made in the area above mentioned, minerals and the precious metals have been discovered, and in all instances bearing features and characteristics common to these in fully developed districts.

The silver-bearing deposits of this belt are mainly in the Main Range and its spurs, in the Granite formations, and the ores of these are as a rule, sulphurets of silver, lead, zinc, copper and iron, with sulphurets and sulphates of nearly every known metal and mineral.

The gold deposits, both superficial and enclosed of this belt are chiefly in the foot-hills, on either side of the range, and in the valleys and parks that skirt the innumerable streams that break through these at various points. In these superficial deposits the gold exists in its native state amidst the drift material peculiar to these valleys, and in the bed rock which underlies this "wash" from the mountains above. The enclosed deposits are mainly in the gneiss and gneissoid formations, in fissure veins, or lodes, and the gold in these is in mechanical combinations with sulphurets of copper, iron, lead, zinc, antimony, arsenic, and various other minerals and metals, and perhaps, occasionally, in chemical combination with sulphur as a sulphide of gold.

The principal districts on the Eastern slope where the silver mines of this grand belt have already been developed to any considerable extent, commencing at the North, are Grand Island district in Boulder county, the home of the great Caribou mine, the mining districts surrounding Idaho, Georgetown, Fairplay, and the comparatively unknown San Juan region; and on the Western declivity, the districts around Montezuma and St. Johns. Between the developed portions of these geographical divisions thus hastily considered, numerous discoveries of lodes have been made, and at many points mining operations are now successfully prosecuted.

The fully explored "gold belt" commences on the North on the eastern slope, with Word and Gold Hill districts, in Boulder county, and continues on southward through Gilpin county, and southward and westward to the western rim of South Park, and still westward and southward around the headwaters of the Arkansas, and southward to the San Juan mountains in Conejos county, on the southern boundary of the Territory. On the western declivity of the range, the gold belt extends from Middle Park southward, through the districts around Breckenridge and the headwaters of Ten Mile and the Blue River. This vast area, rich in mineral and metallic wealth is without parallel in the world, and is destined to yield untold treasure to its fortunate possessors, a great nation and the pioneers of this new and wonderful country—Colorado.—Georgetown Miner.

COAL IN CHINA.—According to Baron Richthofen and others, the Chinese coal-fields cover an area of upwards of 400,000 square miles; 12,000 miles of coal have sufficed to make Great Britain the greatest workshop of the world. In the province of Hunan, a coal-field extends over an area of 21,700 square miles. There are two perfectly distinct coal beds in Hunan, one bearing bituminous and the other anthracite; the latter being most conveniently situated with regard to conveyance by water, easily mined, and covering an area equal to that of the anthracite coal-fields of Pennsylvania. In quality this coal will compare favorably with the best kinds of anthracite known. The coal area of the province of Shansi is of the enormous extent of 30,000 square miles. This is capable of supplying the whole world, as its present rate of consumption for thousands of years, and has unrivalled facilities for mining. The beds are from twelve to thirty feet in thickness, while the system of coal-bearing strata in this province is about 500 feet in thickness, and contains, beside, an inexhaustible supply of iron ore. Ping-ting chau is conspicuous for an extraordinary and exceptional favorable juxtaposition of coal and iron.

SCIENTIFIC PROGRESS.

An Electrical Tower.

Below will be found something in addition to what we gave last week under the head of a "Novelty in Telegraphing," which we copy from the *Scientific American*:

Mr. William H. Ward, of Anburn, N. Y., has suggested an electrical tower for accumulating natural electricity for telegraphic purposes. The structure which is to be placed on high mountain peaks or other elevated stations is to be made in three sections. The lower portion is a mere shell containing a door. Above this and insulated from it by a diaphragm is the middle part in which are openings or windows having slats pivoted in them, so that, by means of raising or lowering rods suitably connected to such shutters, the openings may be shut or opened. A projecting rod extends over the windows, serving to protect them from the weather and also for receiving the aerial electricity which may be drawn from it by wires for land line purposes. Above this roof is another insulating diaphragm. The highest portion of the tower is surmounted by a bent ventilating tube and vane, so arranged and connected with the rods acting on the shutters that the revolution of the vane by the wind will open the windward and close the leeward slats. The wind therefore assists in driving an aerial current of electricity into the insulated middle portion of the tower, which current passes upward through the upper portion of the tower and out through the ventilator, thus forming a draft by means of which the electrical current is forced out at the vane. Insulated wires leading from the top portion of the tower allow a supply of electricity to be drawn therefrom.

By the use of the aerial electricity which surrounds the earth in the upper strata of the atmosphere, the inventor considers that artificial batteries may be entirely dispensed with, and a circuit formed merely by connecting the aerial current with the earth current. For instance, to bring Buenos Ayres, in South America, in direct connection with New York the following plan would be pursued: one electrical tower is erected on Pike's Peak or any other suitable high mountain in North America, and another similar tower on some suitable peak of the Andes in South America. The former would, by means of land lines, be connected directly with Denver, which place is again connected with all the prominent cities of the States. In a similar manner the southern tower is connected by land lines with prominent cities via Quito. New York telegraphs to the tower on Pike's Peak, and the operator having connected the land line with the aerial current, the signals are transmitted through the aerial current to the town in South America, and thence—the land lines being suitably connected—to Quito and Buenos Ayres.

Interesting Chemical Experiment.

An experiment involving a molecular change in the condition of an element, can be performed as follows:—Let a copper and platinum strip form respectively the negative and positive terminals of a galvanic circuit; immerse these in a hydrochloric solution of chloride of antimony. The result of the galvanic action will be the precipitation of the antimony in form of a fine impalpable powder upon the surface of the copper, from which, when enough has accumulated, it may be readily removed by bending the copper strip back and forth. The metal thus obtained, if placed in a mortar, and vigorously triturated in with the pestle, will detonate with some violence, the explosions being at the same time accompanied with the evolution of light and heat. This curious phenomenon appears to be purely the result of a molecular change, induced in the metal by the mechanical force employed; the consequence being the conversion of the amorphous powder to a crystalline condition. It would be of some interest to note whether the same result would follow the application of heat to the powder, since, from the announcement of Bunsen, made some years ago, the metals rhodium and iridium, when deposited from solutions of their salts in an analogous manner, manifest this property in an extraordinary degree; so much so, indeed, that the scientific world came very near losing the invaluable services of its illustrious discoverer in consequence of a severe accident which befel him from this very unexpected source. It would be a matter of no little interest to trace the analogy here indicated, to one of positive identity in kind, by investigating the behavior of such precipitated antimony when heated, as was the case with the platinum metals experimented upon by Bunsen.

LUMINOUS TUBES.—A NEW EXPERIMENT.—If fifteen to twenty grammes of granulated silver are introduced together with thirty to forty grammes of bisulphide of carbon into a hard white glass tube, and hermetically sealed, then, upon gently warming and then shaking in the dark, sparks will be observed in the tube, which by continued shaking may be rendered quite luminous. Pouring water on the tube causes the luminosity to disappear, but, upon shaking, it reappears again.

Fires and the Atmosphere.

The question why fires at certain times spread so much more rapidly, and are so much more difficult to check, than at others, possesses a very high degree of importance and interest. After all the reasons that can be given for the spread of most of our great fires, nearly or quite all the causes assigned, both by practical and scientific men, could generally be found to exist in cases where the conflagration was comparatively slight, and where the means of extinguishing it proved no less effective than usual.

Every one who regularly attends to an ordinary grate or stove, has frequent occasion to observe that a fire, which burns brightly at certain times with a certain draught, will often require, at other times, a much greater draught to keep it from going out. In some cases this is readily understood; but in many instances it is in a very great degree owing to causes which neither science nor practical observation knows anything about.

The simple fact in regard to the whole matter is, that the different states of the earth's atmosphere are a subject concerning which, like a great many other things, science is able to tell much less than scientific men are generally willing to acknowledge. There are certain philosophic truths, indeed, in regard to the atmosphere, which are well ascertained, and respecting which no one capable of understanding them can have any doubt. But there are others in reference to which we are as ignorant as the ancient Romans. There are very many phenomena connected with the subject of the air we breathe, for which science utterly fails to account, and among these the numerous phenomena produced by the action of fire, occupy no unimportant position.

There is sometimes, in case of a very destructive conflagration, a kind of criticism heard, in respect to alleged want of efficiency in the firemen, which is unreasonable, as the blame often attached to a doctor when a patient dies of a disease from which an individual has, under the care of another physician, recovered. The cases of the two patients—although, so far as could be seen, exactly alike—may have been, in reality, entirely different. So with fires. The skill and energy which will effectually check one, will not always prevent the spread of another, although the circumstances may be, apparently the same.—*N. Y. Times*.

BIELA'S COMET.—Astronomers do not universally indorse the idea that the object discovered by Mr. Pogson, on the 2d of December, was without doubt the lost comet of Biela. All that is certain is that Mr. Pogson turned his telescope on the track of the retreating meteors of November 27th, and saw an object of cometary appearance. If really Biela's comet, something very extraordinary must have happened to that body, which, according to the very accurate calculations of its path, would have been in perihelion on the 14th of October, whereas the group of meteors which produced the shower seen here on the 27th of November, did not arrive at its nearest distance from the sun until the 25th of December. The earth crossed the orbit of that comet, with which the meteors appear to have so remarkable a connection, on November 27th, but the comet itself was far away, unless some catastrophe had occurred to it since last seen, concerning which speculation is quite at fault. It is more likely that what Mr. Pogson saw was another concentration of cometary matter in the orbit of Biela.—*London Athenaeum*.

THE ELECTRIC DEPOSIT OF COPPER.—It is a recent French discovery, that adding a minute quantity of gelatine to a solution of sulphate of copper, prevents the brittleness which copper is said to have that has been deposited by the action of the galvanic battery. The philosophy of this result is unknown. The softness and malleability of copper deposited from a solution of a copper salt by electrolysis is increased by increasing the conductivity of the solution. This acid added to the bath until it has reached the point when the hydrogen gas is about to be given off, will hasten the decomposition, and the copper obtained will be soft and pliable. But what gelatine does to produce an effect, or rather why, we do not understand, any more than we understand why a little sulphuret of carbon added to the solution of a bath for electro-deposition should have the alleged effect of causing the deposit to be so bright as to need no burnishing afterwards.

INFLUENCE OF PRESSURE ON THE SPECTRA OF GASES, AND ON THE ELECTRIC CURRENT.—A foreign contemporary publishes the following information as an observation of M. Cailletet: When a spark from an induction coil is passed through a tube containing a gas under ordinary pressure, the light is feeble and presents in the spectroscopic very indistinct bands. But if the pressure be slowly increased, the bands will become brighter and broader, producing in the end a continuous spectrum. Upon reaching a pressure of two hundred atmospheres the electric current ceases to pass.

CONSERVATION OF FORCE.—Dip the hand in a finger-glass until the temperature of the water therein is raised one degree. An amount of energy is withdrawn from the hand sufficient to project that water to a height of 772 feet above the earth's surface.

A Fatal Flaw in the Darwinian Theory.

Muller recently delivered a lecture before the Liverpool Literary and Philosophical Society on the phase of Mr. Darwin's theory which deals with the possibility of animals acquiring the faculty of articulate speech. Mr. M. maintained that the true barrier between man and beast was language. He gave various illustrations of the essential difference between the expressions of emotions—the language of beasts, and the expressions of ideas or abstract conceptions—the language of man, and argued at length on the impossibility of mere emotional signs or sounds being developed into articulate speech. He ridiculed the idea of the possibility of a gradation from the neigh of a horse to the poetry of Goethe! Man and animals possess emotional language in common, because man is an animal; but brute animals do not possess rational language, because they are not men.

Rational language is traced back to roots, and every root is the sign of an abstract idea, and not the demonstration of an emotion. Mr. Darwin has seen the importance of overthrowing this bar to the maintenance of his theory, and has assumed to find savage languages, which contain no abstract terms; the fact that such have been found is denied. The lecturer holds that until Darwin finds a language containing no terms expressive of the abstract ideas of father, mother, brother, etc. he fails to maintain his position.

MECHANICAL PROGRESS.

The Canal Navigation Award.

The one hundred thousand dollar reward offered in 1871, by the Legislature of New York, to the introducer to the inventor of a plan for a more economical plan for the navigation of the Erie canal, has brought out numerous inventions and plans to that end. Not less than sixteen inventors entered upon the contest, and made actual experiments on the line of the canal—one, however, inventing the use of an engine on the tow path as a traction engine, was ruled out, as not coming within the limits of competition. Another, consisting of a steam rope towage, by means of a wire rope laid along the bottom of the canal, after the plan used to some extent in Europe, was also ruled out. Ten of the devices appear to have given results more or less satisfactory. Four were not satisfactory.

The *Scientific American* says that in respect to nearly all the exhibits they have demonstrated the fact that canal boats may be successfully operated by steam power; but that none have fully and satisfactorily fulfilled the intent and conditions involved in the award.

The next inquiry is whether any of the exhibits are likely, on further trial and such improvements as experience may suggest, to accomplish the ends required. The general impression is favorable for such a result. It was demonstrated by a majority of the boats tried that the cost of transportation by steam may be done at about one-third the expense of horse-towage.

Capt. Goodwin's plan of a train of boats, drawn by a single steamer, appears to be the most promising, and the Captain is very confident that if more time is given him to make modifications in his plans, he will be able to solve the problem of canal navigation in a manner entirely satisfactory. Other inventors, also, appear to feel hopeful of their individual plans, and nearly all have joined in a memorial to the Legislature asking for an extension of the time, which, under the original award, expired with the close of navigation last fall. The subject is of so much importance to the State that it is thought the Legislature will grant the extension asked for.

STEEL RAILS.—It is said that the demand for steel rails during the past year has been so great that they can hardly be obtained at any price; the supply is limited from the lack of ore free from sulphur and phosphorus, and recourse has been had to extensive mines in Spain. It is hoped that America will supply herself with steel rails, and import only those of iron required for new lines or light traffic. There is a scarcity of suitable ore for the Bessemer process throughout Europe, except in Sweden, where the recently discovered coal will render the ores more available.

NEW PROCESS FOR PLATING.—A Hartford, (Conn.) man has invented a new process of plating iron or any composition metal either with gold, silver or nickel, the plating being so driven into the surface that it becomes a part of the metal itself. Experiments have been made on boiler iron at Colt's with perfect success, and the government is going to test the merits of the invention.

Value and Utilization of Water Power.

During a late speech at Lonsville, General Butler said, on the subject of the utilization of water privileges for manufacturing purposes: "There is one bond-servant that we have in Massachusetts which you have not yet captured and made work for you. You have a river 500 miles in length with falls of 26 feet. We have a river in Massachusetts—the Merrimack—of only 90 miles in length, and we have captured it, and made it do the work of 65,000 horses. In adding to your industry that power—you have it right here—you will find that you are using a power which will increase your facilities with the least cost. It is the secret of Massachusetts' prosperity—a state with a sterile, rocky soil, and eight months of winter."

We never look at the rivers of California, without wondering that so little is done to utilize them, either in the way of irrigation, or in harnessing them to machinery. The remarks quoted above are quite as applicable to this State as to Kentucky. At a single locality on the Merrimack river at Lowell—10,000 horse power has been utilized, which has been the means of collecting a population of 40,000, producing an annual value in manufactures of \$24,000,000. Fall River has a population of 23,000, and a valuation of \$17,000,000. Lawrence, with a power nearly equal to Lowell's, has already a population of 30,000. It has been laid down as a safe proposition that a population of 1,000 may be looked for to each 166 horse-power employed in textile or equivalent manufactures, whether that power be derived from water or steam.

Moreover it is not absolutely necessary that our rivers should plow over dams or down rapids to utilize their power, to at least a moderate extent.

At any point in a stream of reasonable depth, large paddle-wheels may be attached to an anchored boat, or to a staging built across or out into the stream, which may be turned by the water that flows incessantly beneath, and which would thus catch a vast deal of power, which, for the want of such similar contrivance, we now extract from coal at a cost of from \$10 to \$15 per ton. Such wheels are largely employed by our California miners for pumping purposes; but we have no recollection of ever seeing such wheels employed for any other purpose, either in California or the Atlantic States.

At Mainz, on the Rhine, all the grain is ground by mills located on boats, like those above described, notwithstanding the inconvenience of their presence to the crowded commerce of the river. The barges are located in a line straight out from the shore, one beyond another, and perhaps a dozen in number. In the dearth of coal prevalent in England, ingenuity is racked to find new sources of power, and a Mr. Bramwell proposes to erect dams across narrow inlets of the sea, and when the tide comes in to shut it in and make it work a turbine wheel and pump water into a system of accumulators, when it would be transmitted to neighboring manufacturing districts. This is possible from the fact that a very small pipe, if strong enough, will transmit hydrostatic pressure to any distance or depth, as perfectly as though it were a canal.

Electricity vs. Boiler Scale.

There is good reason to believe that electricity will yet be made to prevent, at least in a great measure, that great annoyance to engineers—the formation of scale in boilers. The theory of this preventive is given as follows:

That as an electrical current will decompose a chemical compound in the Chemist's Laboratory, it can be made to do the same work in the steam boiler, the sugar pan, the salt kettle, and any other vessel upon which mineral or earthy salts are deposited. The electric current destroys the affinities by which the salts are held together and adhere to the boiler metal. This result is accomplished by placing the boiler in circuit with a galvanic battery, which is removed from time to time, like batteries used in the telegraphic service. The result is the incrustation does not form under galvanic influence, the substances that otherwise would go to form scale remaining in a soft decomposed state, which can be ejected through the blow off pipe like any other soft sediment. This method of preserving boilers from the evils of incrustation has been in use in some parts of the country for five or six years, and is beginning to attract considerable attention because of its novelty, and the new field of scientific research which this solution of a difficult problem has brought about.

TINNING CAST IRON.—A correspondent of the *Scientific American*, in reply to another who asks for a method of tinning cast iron, says: I used to tin boxes by heating them, then using a flux of alcohol or salt of ammonia, and tinning with a common soldering tool or a copper wire swab, with melted solder. They were cast iron boxes for steam engines and other purposes.

Another reply to the same query is as follows: A process for tinning common cast iron is one of the things that is yet to be found out. Any person having a process to tin gray iron and to give it a finish equal to what is known to the trade as C plate or even to give it a smooth coat of tin, would have too good a thing to let lie round loose.

MINING SUMMARY.

The following is mainly condensed from journals published in the interior, in proximity to the mines mentioned.

California.

AMADOR COUNTY.

HOOPER.—*Amador Dispatch*, Feb. 22: We are informed that they have struck some very rich rock in this mine at Plymouth.

MORNING STAR.—Hooper's works have been erected at this mine, and the work of hoisting rock, will commence next week.

PLACER MINE.—*Amador Ledger*, Feb. 22: We are pleased to learn that our placer miners are all in high spirits over the prospects of having a good supply of water, and as soon as the storm is fairly over we expect to hear of some very flattering clean-ups. There is much ground in this vicinity that would pay good wages if water could be had to work it. In and around Volcano there are some rich mines now being worked.

CALAVERAS COUNTY.

GRIN.—*Calaveras Chronicle*, Feb. 22: The progress of operations continues highly satisfactory. The yield last week was greater than ever before, averaging about \$1,500 per day. The recent storms have not interfered with the working of the mine in the least, causing no perceptible increase of water in the shaft. We learn that the work of sinking the south shaft 100 ft. deeper—making 700 in all—will be commenced shortly.

HUMSON.—We learn that rapid progress is being made in sinking the shaft on this mine. The contractors expect to have 50 ft. of the 100 to be sunk, completed by the first of March. The ledge is looking first-rate and the prospects of the mine are flattering. The shaft will be 230 ft. in depth when the present contract is finished.

COMMENCED WORK.—Messrs. Schrack & Robinson, who for several months past have been engaged in opening a hydraulic near the Mokelumne Station road, about a mile this side of Messengers', are just commencing operations. They were compelled to dig a ditch several miles in length to conduct water to their claim, and the performance of a great deal of other labor was necessary in getting ready for washing. The hydraulic has a pressure of about 150 ft. we believe, the water being conducted through a 7-inch iron pipe.

EL DORADO.

MINING DEVELOPMENTS.—*Placerville Democrat*, Feb. 22: We are informed that new developments of rich deposits have recently been made in Jones' Hill, above Georgetown, and also in this sterling old mining camp of Mammoth Hill. The abundant water supply secured by the late enlargement of the ditch is greatly stimulating the mining industry in that portion of our country.

POCAHONTAS.—*Folsom Telegraph*, Feb. 22: This mine situated near Shingle Springs, is proving to be a very rich mine. A few days since we were shown some exceedingly rich rock struck lately at the lowest depth in their main shaft. The mines in El Dorado county, wherever a sufficient depth has been attained, are proving to be as rich as those of Amador or Nevada counties. The fact is the same ledge extends through all of the above named counties.

KERN COUNTY.

BRIGHT STAR.—*Havilah Miner*, Feb. 22: The proprietors of this mine have discovered and opened a rich chimney of quartz, which measures 6 ft. from wall to wall. It prospects magnificently, averaging \$41 to the ton. It was struck after running through a thick seam of clay. They now contemplate opening the mine along the entire ledge, a distance of several thousand feet.

ST. JOHN.—This Co. have their shaft sunk 600 ft., with no diminution in its richness or width of chimney. The stamps are kept in constant operation.

McKEANEY.—These mines are in a most encouraging condition. Rich rock is now being extracted. A run will be made as soon as the new machinery arrives from below.

VENUS.—One of a very valuable character is being taken from this mine.

ST. PAUL.—A road has been completed to this new mine, preparatory to making a run.

SOMER.—This mine is turning out a large amount of bullion. This mine shows a finely developed ledge of immense richness. It can be favorably compared with any mine on the coast. Report says that the company contemplate erecting a 40-stamp mill, which, in addition to the old one will make a crushing power of 56 stamps.

FRANK STAPLES & Co. have partly constructed a road to their new mine. An 8-stamp mill will be put up in Bull Run Creek, a few yards distant from the mine, next month.

NEVADA COUNTY.

INAR.—*Grass Valley Union*, Feb. 22: This mine seems to have taken the hit in its teeth and is running away. After a 3-days run, this week, the amalgamators of the mill were skimmed off and the skimming gave \$12,000 worth of gold.

PLACER COUNTY.

SNOWEN.—*Placer Argus*, Feb. 22: From a correspondent at Michigan Bluff, we learn that the mines in that section of the county have not been able to work their claims for the past two weeks on account of the great quantity of snow. They have had no water in the ditches during that time. The prospects for an abundant

supply of water was never more flattering for mining operations in the spring.

PLUMAS COUNTY.

IAON MINE SOLN.—*Plumas National*, Feb. 15: It is reported that the iron mine near Mohawk Valley has been sold to a party of heavy capitalists and it is thought that some very extensive operations will be commenced in the spring towards opening and developing this vast deposit of iron ore. That highly renowned scientific explorer, Clarence King, pronounced this mine the finest body of ore west of the Rocky mountains.

SHARP LAKE.—*Cor. same*, Feb. 20: Metcalf & Co. have their new reservoir and ditches in first-class order, claims about ready to operate on with a Little Giant, etc. Smith Bro. & Co. are following the even tenor of their way and doing well, plenty of gravel, and water to wash it up. The Forest Hill bedrock tunnel is still being prosecuted, and the company expect ere long to strike the gravel and pay grit. The Mendoza Hill is lying idle for lack of water. The Wapponese Creek boys are all doing well. Old Bean Hill has turned out well; took out over \$2,000 in 12 days' run.

SAN DIEGO COUNTY.

STONEWALL.—*San Diego World*, Feb. 15: This mine continues 12 ft. while on the 140 ft. level. It is now prospected, with drift or level, at the depth of 60 ft. from the surface. This ledge is fully 500 ft. long. Another at the depth of 140 ft., has been run 100 ft. The ledge averages from 10 to 12 ft., and with only a sufficiency of water for running the 10-stamp mill 6 or 7 hours a day, and crushing and running every thing without selection between the 12 ft. walls the yield has been most gratifying, and advances the mine to a high standard. The "Stonewall's" returns have arisen from average rock.

SONOMA COUNTY.

DISCOVERY.—*Sonoma Democrat*, Feb. 22: Two and a half miles south of Cloverdale, near the railroad track, opposite the old grave yard, a man named Savage and Joe Dougherty have located a gold quartz claim which prospects brilliantly and promises well for the discoverers. The Eureka Mining Co. has been organized to develop the mine. A ledge of 6 ft. is well defined, the crops of which assay \$12 per ton. Surface diggings were worked in the same neighborhood about a year ago which paid \$3 per day to the hand. A later assay of rock taken from the mine shows a yield of \$33.50 in gold to the ton.

TULARE.

WHITE RIVER MINES.—*Cor. Visalia Delta*, Feb. 20: I visited these mines a few days since, and the prospects for rich developments are very flattering indeed. First in importance is the Eclipse Ledge, employing 20 men, taking out ore that pays from \$30 to \$40 per ton. The mill (5 stamps) is undergoing repairs at present. The ledge is well defined, and has an average width of 2 ft.

MR. ARCHIE DONALDSON, is working 4 men in the Arnold mine. Rich developments are expected, and there is every indication of a good mine.

A new discovery has lately been made by Messrs. Biggs and Emerson, 7 miles above Tail Holt, and 300 yards from White River, of the Green Monster Ledge, over 100 ft. in width, it has 2 ft. of solid ore on one side which assays over \$40 in gold.

TUOLUMNE COUNTY.

INDEPENDENT. Feb. 22: Table Mountain, Alpha Co. is now digging up as handsome a bank of gold-bearing gravel as ever delighted the eye of a gravel miner. It is from 4 to 5 ft. thick, and fully half its bulk consists of large, well-washed boulders. At the end of the third week from the time of breaking ground the hardest kind of blasting rock was encountered. They then mounted the rock, and running a crescent-shaped drift to the spot they were aiming at, struck good gravel and gold in five days of 24 hours each. There was no further doubt of the richness of the mine.

OMEGA.—A bedrock tunnel was started over 16 years ago, and with a few interruptions the slow and expensive work of blasting through this solid stone bowels of the mountain has been carried on ever since with wonderful pluck, perseverance and energy. Last week the work was given up as hopeless. The tunnel is evidently too low to strike into the channel of the mountain.

PATTERSON.—The purchase has changed the appearance of things round the neighborhood very much. A fine office and other buildings have been erected. A 10-stamp mill will also soon be completed, with additional 10 stamps to be built immediately. In the gulch, a few hundred feet above the mill, two tunnels can be seen in operation, driven into two different hills, but opening into the same vein. The first tunnel we meet has a very hard rock, but worked without interruption, 8-hour shifts, intending to tap the vein 120 ft. deep. Above this tunnel, and on the slope of the hill is a shaft also in full blast, to intersect the tunnel below, for ventilating the mine and other purposes. A few hundred feet up the gulch we come to the other tunnel, closed up for several years, but is now being re-opened, substantially timbered, and will soon be ready to take out rock for crushing. The vein in this tunnel has been worked extensively in one place several years ago, but still shows plenty of rock in sight, apparently equally as good as the rock previously taken out.

Nevada.

ELY DISTRICT.

ALPS.—*Pioche Record*, Feb. 16: About the usual quantity of ore is being taken out of the mine at the bottom of the lower level. The winze from the same level has improved greatly. The ore breast now being fully a foot and a half in width. This is a development from a seam of only an inch in width, which was struck about 3 weeks ago and improvement continues. There are now at least five veins ore on the dump.

PRICING.—There is a vast amount of first-class ore out. Its character is best shown by the average car-sample assay, which is of ore hoisted through 16 consecutive days, the return being \$20 to the ton.

EXCELSIOR. This mine is certainly improving in all parts. There are now 200 tons of first-class ore on top, and hoisting continues, from 8 to 9 tons being dumped daily. The last ore drilled pulped \$150.

PAOE AND PANCA.—The drift is now in well on to 600 ft., and the rock is growing more metalliferous very perceptibly.

PARAN.—Main shaft is now down 80 ft., following the ledge the entire distance. The vein is fully 20 inches in width, and the ore looks well.

CHIEF.—The new shaft below the 90-ft. level has improved very much the past week. There are now about 6 inches of very fine ore on the foot-wall, and the ledge is about 3 ft. wide between the walls.

LA PAZ.—Work continues on this mine with improving indications—the improvement being very marked. A series of rich veins seem to be converging, and those touching the ledge are very rich.

PEATINE.—Work on the cross-cut from the 200-ft. level continues, with very flattering indications.

MAZEPA.—Usual force at work sinking the winze, which is now down about 70 ft. The mine improves as depth is attained.

ORIENT.—Work continues in the drift, which is now 75 ft. The contractor tells us that the indications have greatly improved.

SILVER PEAK.—The incline maintains its average width and the ore its average richness.

PROSPEX.—Sinking in the new shaft progresses finely; it is now down 310 ft. The average progress is 3 ft. every 24 hours.

CHAPMAN.—Drifts are being run from the 360-ft. and the 430-ft. levels to tap the ledge; but it has not yet been reached in either drift.

HUMBOLDT.

MANTROCK.—*Silver State*, Feb. 22: This is a continuation of the Arizona proper. About 250 ft. from the surface we arrived at a point where ore is being extracted at present. A slope, 150 ft. long and 50 ft. high is open on this level, the average width of the ledge being about 2 ft., carrying milling ore principally. From this level an incline shaft, 70 ft. deep, is sunk on the vein. At the bottom of this shaft a level is being run for the purpose of opening another slope. At this point, the deepest yet reached, the ledge is very regular and less broken than nearer the surface, and carries a much greater proportion of shipping ore. Retracing our course to the mouth of the incline, and proceeding a considerable distance in a southerly direction on the main level, we reached a point in the Silver mine where work is being prosecuted. The ledge at this point is looking well and is yielding both shipping and milling ore.

AMAZON.—Wending our way through inclines, levels and shafts, compared with which the mazes of a labyrinth were but a plain road, we reached a level 300 ft. west of the main tunnel. This level is 380 ft. long, and the ledge is from 2 to 5 ft. wide the entire length, exclusive of a chamber about 25 ft. long, where the ledge is from 10 to 15 ft. thick. There is an immense quantity of ore in sight at this point, the "backs" extending toward the surface 300 ft. Proceeding to the main tunnel, about 1,200 ft. from its mouth, we descended an incline 70 ft. deep from the level of the tunnel. At the bottom of this incline a shaft is being run south. The ledge exposed by this drift is from two to four ft. wide, and the ore is impregnated with native silver.

HENNING.—The working force on the Henning has been increased; 21 men are now employed. Developments have demonstrated beyond doubt that it is a valuable and permanent mine.

RYE PATCH.—The Butte mine is running steadily, and has all the ore it can possibly crush from the Butte mine. Work has been suspended for several months on the Alpha mine, partly owing to litigation. There are 3 mining companies now actively engaged in prospecting, with fair prospects of success. The Lincoln, owned by Cody & Co., on which work is now prosecuted, is a good vein, and has yielded considerable ore. The vein carries a great deal of water, which made the working of the mine by shaft very expensive. A tunnel is now being run to the level of the vein, at a depth of 300 ft., and save the expense of hoisting water.

WASHOE.

JUSTICE.—*Gold Hill News*, Feb. 22: South drift still in fine looking quartz, and prospects at other points very favorable.

CROWN POINT.—Yielding about as at last report. The mine looks splendidly at all points, especially so at the 1,300-ft. level. At this level a cross-cut east is started from the third drift, at the belcher line, which is now in about 10 ft. in very rich ore. The drift north at this level is still in good ore and a cross-cut is started from it to the east, which is 7 or 8 ft. in good ore. The main incline is still sinking and the drift south from it at the 1,400-ft. level is driven ahead energetically.

BONORA.—Daily yield, 380 tons. This mine is yielding unusually well at present, and the prospect is bright. The receipts will foot up to \$500,000 or more this month. The ore-breasts at the 1,000, 1,100 and 1,200-ft. levels hold out finely, and a general improvement in the character of the ore is noticeable. The 1,200 is looking and yielding especially well. The drift at the 1,300-ft. level from the Crown Point mine has passed into Belcher ore-body, which is of very rich character at that point.

Work is resumed in the Empire mine, under the active supervision of Superintendent Archie Bonland. At the 1,600-ft. level, toward the south end, some very good ore is found, which assays as high as \$500 to the ton. The body is 25 or 30 ft. wide.

SAVAGE.—The incline is down below the 1,700-ft. level and the new 1,700-ft. station is nearly completed. About the usual amount of ore is being extracted from the upper levels.

HALE & NORCROSS.—The yield of the ore-breasts between the 8th and 9th, and 9th and 10th stations, continues good, and taken altogether, the prospects of the mine are quite encouraging.

COLLIER POTOMI.—Daily yield, 40 tons of ore, the assay value of which is \$33 per ton, showing a large decrease in the daily yield, which is mostly owing to inability to get the ore hoisted to the mills, the dumps all being full.

YELLOW JACKET.—The main drift east, at the 1,400-ft. level, meets with no sign of the east wall. The 1,300-ft. level has reached the north line, and the cross-cutting at that point develops some very good indications of a valuable body of ore.

GOULD & CURRY.—The main east drift on the 1,500-ft. level is again making fair progress, the water in face gradually decreasing.

CALIFORNIA.—The northwest cross-cut from the main north drift has developed a fine body of good milling ore, which is being hoisted to the surface as fast as the drift progresses.

SILVER HILL.—The main north drift at the first station is still driven ahead, the face in good ore. Sinking the incline is making excellent progress, the rock in the bottom working well.

SENATOR.—The Co. have been compelled to shut down their works for the last few days on account of their being unable to get wood, but the furnaces have been so altered as to burn coal, and they expect to resume work shortly.

STERNA NEVADA.—Daily yield 55 tons of good milling ore. It is with great difficulty that sufficient wood can be obtained to keep the mill running.

SILVER CLOUD.—The ore-breasts at the first and second stations, are looking and yielding as large a quantity of good ore as at any time heretofore.

BUCKEYE.—A fine body of good ore 5 ft. in width has been developed in the raise, 200 ft. south from the first station. The mills were obliged to again stop work day before yesterday, on account of the impossibility of obtaining the necessary supply of wood to keep them running.

JULIA.—The main east drift, on the 800 ft. level, is making the usual headway, with no water in the face. In the west drift, on the 1000-ft. level, the rock is working well and water does not interfere.

VICTORIA COY.—The main north drift on the 1167-ft. level from the Gould & Curry shaft is making excellent progress, the rock in the face working well. Sinking the shaft is making excellent progress, the rock at the bottom working soft and well.

ARIZONA AND UTAH.—The shaft is down 204 ft. the rock in the bottom working well and the sinking-making excellent progress. Strata of quartz and clay are continually encountered as the sinking proceeds.

KENTUCKY.—Daily yield 30 tons of good milling ore from the old upper workings.

WOONVILLE.—At the third station the north drift is in 46 ft. and the south drift 64 ft., the ore body in each of the drifts continuing as large as heretofore, and the assay very high in gold.

SURRO TUNNEL.—Total length 3,640 feet. Work progressing as usual.

WHITE PINE.

ROBINSON DISTRICT.—*White Pine News*, Feb. 22: The mines are looking better than ever before, and work on them is only delayed by the inclement weather of the last few weeks. J. M. Ogden, Superintendent of the Canton Co. is expected to arrive soon, and will immediately commence the erection of furnaces on a large scale. Indications point to that section as one of the most promising of all mining camps outside of Hamilton.

Arizona.

MINING ITEMS.—*Arizona Miner*, Feb. 15: The gold dust brought in town this week from Lynx Creek, is in the neighborhood of \$1,000. Buffalo Joe went over there recently and struck a claim out of which he has washed about an ounce a day.

A. C. Williamson and other gentlemen brought in some very rich rock from the Star Eagle, in Bradshaw. The ore looks like Tiger and Benton combined. It is rich in both gold and silver.

During the past 2 months several shafts have been put down upon the War Eagle, Tiger and other lodes, and that the ledges in said new shafts, are good.

From the Hassayampa there are very favorable reports. J. A. Anderson and his partner have struck rich placer diggings in a bar not far from Norton's Carters' mill. All the miners are sluicing and taking out the good yellow gold in paying quantities.

Mr. Allen Cullumber brought up recently, from Walnut Grove, several ounces of gold, the proceeds of a few tons of Big Rebel ore, recently worked in his little mill. He is now taking out richer ore, and will soon be here with a larger lot of dust than that which he recently brought up.

Near Weaver, the Marcons Company are working with their usual vigor. They have now the cream of 6 tons of pulverized ore in their arrastras and intend to keep on crushing until the last of next month.

From Wickenburg the news is quite cheering.

YUMA COUNTY.—We have heard that Mr. Berger had, so far, failed to extract the gold from the mine he has been working, near Ehrenberg, which mine is rich in floor gold.

MOHAVE COUNTY.—Mines of great richness are found on every hand. Since the discovery of the Gunsight mine, in Cerbat Valley District, many other mines and extensive ledges have been discovered in the same district. A very rich discovery was made by J. R. Boner and company of this town, on the north side of the Wapiti Mountains. The first location is named "The Boner." This ledge is 12 ft. thick and wide, and the rock assays from \$300 to \$1,000 per ton. The next location one-half mile south, is named the "Dean." This rock assays from \$17 to \$1,000 per ton, and the ledge is from 8 to 9 ft. thick. The next location is about 1 mile south. The rock is of the same character as above described, and the ledge is here 12 ft. in thickness. In all these locations horn silver and native silver are present in abundance, without the presence of any rebellious ores.

Agenteleman just up from the Gunsight mine reports said mine as rich, or richer, than when I last wrote you. We are now shipping ore from the Gunsight to San Francisco.

Col. Baker's furnace and reduction works, at Chloride, have proved under his excellent management, a complete success.

Colorado.

CARBON MINE.—*Central City Register*, Feb. 6: This mill, in the last week in January, yielded silver bullion to the amount of \$5,050.19; during one-half each of the first and second weeks in Feb., the yield was \$13,645.49, coin value, making the sum total for the two weeks, redundancy value, \$22,695.68. The mill has but 15 stamps. The average yield from these is \$3,000 per day. As the Carbon mine which supplies it, is producing an average of 25 tons per day, the mill has been found much too small to keep up with it, and Mr. Breed has therefore resolved to double its capacity. The value of the ore ranges between \$160 and \$400 per ton. The best quality is worth from 1,200 to \$2,000 per ton. All the extraneous material from 5 ft. wide to 10 ft. to the mill without assorting, and all crushed together.

Montana.

NEW TUNNEL.—*Deer Lodge Independent*, Feb. 8: A company was organized to build a tunnel a few days ago and work commenced on a tunnel under the mountain north of the town. Some very rich float ore has been found on the hill and the projectors hope to strike the vein from which it came.

VIRGINIA CREEK.—The mines are in the gulch and about 10 ft. deep, gold of good quality, both fine and coarse, nuggets worth \$10 having been found last season. The mines have averaged for 2 years not less than \$10 per day to the hand, and the pay streak is from 40 to 100 ft. deep.

ROCKY AND SILVER BOW.—Nelson Wolverton has been engaged for several weeks in the construction of a ditch to carry water from Silver Bow creek, at a point two and a half miles above Rocky city, to the bar and hill diggings lying north of Rocky and Silver Bow. The mines covered by the ditch were discovered last summer and pay from \$5 to \$10 per day.

BEARTOWN.—Chas. Schmitt & Co., Jas. Brannan & Co. and W. Grimes & Co. are making from \$9 to \$12 per day clean "gulchable" dust; which is more than average for placer mines located within 30 miles of the summit of the Rocky mountains, in latitude 46 degs 50 min.

CHEERY CREEK.—*Cor. Avant Courier*, Feb. 15: On the Eberhardt shaft has been sunk to a depth of 83 ft., and the ledge at that depth shows a 3-ft. vein of ore, some of which is exceedingly rich. The Enclosed is open to a depth of 50 ft., with the ore improving as greater depth is attained. The Davis lode is looking better than at any time since discovery. The shaft on this lode is down 45 feet, and the proprietors are sanguine of being independently rich in very "short order."

About 4 weeks ago George W. Resford found a new ledge 5 miles east of the camp, situated in the main belt of the range 20 ft. in width, which yields, by actual working process \$80 per ton. The rock was worked by the Turner process in Harper & Co.'s mill at Silver Star. Messrs. Harper & Co. also worked 2,500 pounds of average rock from the Eberhardt mine with a net result of \$218 per ton.

Effect of Gold Discoveries.

Since the days when the sons in this tale were rewarded for obeying their father's dying request to search for treasure in the garden, the precious metals and stones have been wonderful agents in advancing wealth, civilization and colonization. The utilitarian who regards personal adornment, when it assumes the shape of carrying metals or stones in one's ears or nose, or slave-like chains around one's neck, are remnants of gross barbarism must still admit that the artificial value placed upon precious metals and precious stones has been the chief cause of discovery and colonization. Without going back to the days when ships went from Palestine to Tarsish, we may touch upon some main incidents of which we have a complete history and glance at the influence of the precious metals on the history of the world. To tap the wealth of the Indies, to find the mines from which the gold for Solomon's temple was dug, was the object alike of the great father of discovery and the succession of bold Portuguese navigators who spread along the Western Coast of Africa, doubled the Cape, and who have left their names in India. Love of gold was the origin of the demolition of human sacrifices and cannibalism among the Aztecs, and the cause of the fall of the Inca Power in Peru. But the effects of discovery of gold in our age have been more wonderful than any which have preceded them. Some of us can recollect Texas and California when people were few and far between, when the population consisted in great measure of out-lawed Yankees, of half-caste Roman Catholic priests and the most wretched and faithless semi-Christian Indians. The land was good and inviting, and, as in Italy, men seemed to be the only growth that dwined there. But soon the cry of gold reached the utmost parts of the earth, and drew people from the Old World and the new, from China and from Germany. Gambling and speculation spread the news. Every outrage rendered the place more famous. San Francisco, from being a wretched monastery, grew as few towns have ever grown. Its isolation was felt at Washington and New York. Hence the Pacific Railway, the steamers to Shanghai, Hongkong, Australia, Japan and New Zealand. Within our own recollections an exploring party went from Tasmania to Port Phillip and returned with the impression that the time had not arrived for planting a colony there. A small one, however, was planted, but dwindled until the surplus population of California, enthusiasts from England, and the Chinese were drawn to the gold fields of Victoria. The new fields had attractions alike for the lovers of adventure and the lovers of gold. There grew into early maturity the fine town of Melbourne; there industries, common to all Australian colonies, developed themselves, and next to the Dominion we may call Victoria the finest of our colonies. The great wheat fields of North America remained the home of the buffalo and Indian hunter until gold fields drew men from England and the States. The isolation of British Columbia from the rest of the world has, however, prevented such advances being made in prosperity as its mineral and agricultural wealth would justify us in expecting. But it is the parent of the North Pacific Railway, the future road from England to China. The land of the Griquas and the Free Orange State in South Africa have caused hundreds of blunders to be made in the Colonial Office and thousands of inconveniences to the Cape Government until the diamond fields were discovered and peopled by men who thought no more of a Griqua, a Dutch Boer or a Hottentot than of a plain English Digger. Then the Colonial Office stepped in and gave to the diggers such liberty as they were prepared to fight for.

So far the gold fields have been found where they have done the most practical good. If we could have pointed out a place out of India where we should have liked the next gold field to be found, we should have said near Port Darwin. The South Australian Government has long endeavored to turn the northern territory to account. It was hoped that it would become the great horse-breeding colony of India, and that it might become a colony partly of natives of India and partly of Europeans, and thus the northern portion of the great continent of Australia, as well as the southern would soon become settled. And now news comes to us that gold in large quantities has been found at this very place. Thus gold discoveries will speedily cause the far off and unknown portions of the world to fill up and become the prosperous homes of millions.—*Overland Athenaeum and Daily News.*

LEAD, next to iron, occupies the most important place in the mineral products of Missouri. The lead mines are now only partially developed, but they cover a vast area of territory, and will in time prove a source of great prosperity to the State. Foreign pig lead was for many years imported into St. Louis, but the quantity gradually decreased, falling in 1869 to 7,857 pigs, and to nothing in 1872. During the past year the receipts of lead at St. Louis amounted to 285,769 pigs, or 22,882,650 pounds of which 20,427,000 were produced in Missouri. The exports of lead from St. Louis, in 1872, amounted to only 4,718, 223 pounds, leaving 18,164, 427 pounds retained for home consumption. The soft brands of Missouri lead are chiefly used for the manufacture of white lead, rivaling for this purpose the best imported pigs.—*Iron Age.*

Fish Culture.

The artificial culture of trout is a subject which has but recently began to attract any attention on this coast, although in the Eastern States it has been carried on extensively. A number of plans have been devised for making the fish spawn naturally, in artificial races built for the purpose. One of the best of these was the invention of Hon. Stephen H. Ainsworth. It consists of a race of any length from ten to fifty feet and from two to six feet wide, according to the number of trout to be used and the amount of water to supply the pond.

For large trout the water should be two inches deep at the upper or supply end, and fifteen inches at the lower end where it empties into the pond, with a gentle current its whole length. This will give good spawning depth to the water for trout of all sizes from six to twenty-four inches long. A race only three feet wide and from fifteen to twenty feet long, will be ample for a pond of one thousand or eighteen hundred trout.

To the bottom of the race are fixed fine wire cloth or screens, a finer and a coarser one, for the spawn as it is deposited by the parent trout, to fall through; but which cannot be well de-

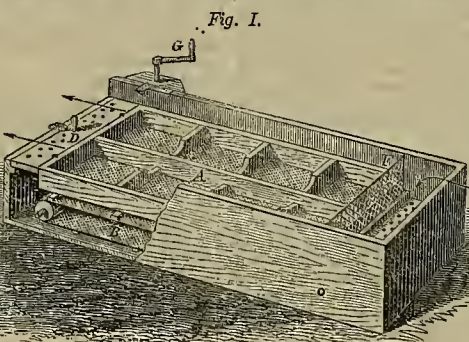
scribed for want of space in our columns, nor can their management be made plain without suitable engravings. We must refer the reader therefore to the popular works of the day on this subject.

Our object in speaking of this invention is to contrast it with a greatly improved one, The Ainsworth races, though answering perfectly in making the fish spawn naturally, are nevertheless attended in their management with considerable labor and exposure. This latter ob-

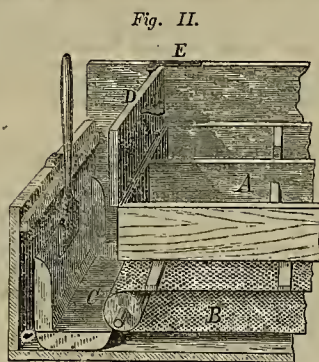
jection was ingeniously surmounted by Mr. A. S. Collins the partner of Seth Green, the famous fish culturist of New York, in a modification of the Ainsworth races, known by the name of the Roller Spawning Box.

This improved roller spawning box for taking the naturally impregnated eggs of brook trout, salmon, etc., is shown in the accompanying cuts. Figure 1 is a spawning box with a portion of its side removed. A, is a double row of coarse wire screens; B, an apron of fine wire cloth; D and F, are both screens. Fig. 2 shows an enlarged view of the front of the same box in which, A, is a double row of coarse wire screens; B, an apron of fine wire cloth; C, apron to receive the eggs; D, a screen; and E, a catch to hold the screen, D, when raised.

In the Roller Spawning Box, the principle used is that of the Ainsworth screens, and the improvement consists in a new and convenient method of collecting the eggs. A double row of coarse wire screens (three meshes to the inch, eight in number, each two feet square, are put together in one frame, eight feet by four. These screens are to be filled with



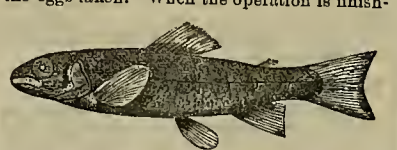
SIDE VIEW OF COLLIN'S SPAWNING BOX.



FRONT OF SPAWNING BOX.

top of the box, or the top of the box may be cut down until the water will enter on the level at which it is intended to stand over the screens.

A screen, intended to prevent the fish from running beyond the race or getting into the lower part of the box, may extend to the bottom, or be arranged differently; a screen placed at the front of the box is also intended to prevent the fish from getting below. When the eggs are to be taken, this screen is raised on hinges to an upright position, and confined by a spring catch or latch. This confines the fish which may happen to be in the race, and none of them can get below. The pan is then lowered to its position, the roller turned, and the eggs taken. When the operation is finished the screen is again lowered, the button turned, and the work is done.



A concise and greatly extended description of these spawning boxes and the way to use them can be found in a new work entitled Domesticated Trout, how to Breed and Grow Them, by Livingston Stone, A. M. For sale by A. Roman & Co., S. F.

The Cold Weather in Iowa.

Ens. PRESS:—Having kept account of the weather during the last month, I thought it would be interesting to the residents of California to know what kind of weather we have in Iowa during the month of January. The mercury stood as follows:

Jan. 1.....	-18°	Jan. 17.....	-18°
" 2.....	-10°	" 18.....	-8°
" 3.....	-25°	" 19.....	-22°
" 4.....	-6°	" 20.....	-22°
" 5.....	-10°	" 21.....	-20°
" 6.....	-8°	" 22.....	-10°
" 7.....	-20°	" 23.....	-8°
" 8.....	-18°	" 24.....	-10°
" 9.....	-15°	" 25.....	-25°
" 10.....	-8°	" 26.....	-25°
" 11.....	-6°	" 27.....	-10°
" 12.....	-8°	" 28.....	-3°
" 13.....	-15°	" 29.....	-20°
" 14.....	-20°	" 30.....	-10°
" 15.....	-15°	" 31.....	-6°
" 16.....	-25°		

When a (-) precedes the figures it is below zero.

Clear Lake, Iowa, Feb. 1st, 1873.

M. H.

Utah Coal for Nevada Mines.

Nevada has a deep interest in the development of the coal fields in Utah; we of Eastern Nevada more particularly. Therefore we gladly transfer to our columns the following from the Salt Lake Tribune on this subject:

The Enterprise quotes our recent articles on the availability of the Southern coal region to Nevada by a narrow-gauge road from the coal fields to Pioche, and thence by roads now in contemplation. It concludes thus:

"This coal of Southern Utah might, by means of narrow-gauge transportation, be advantageously used in Southeastern Nevada, but it is doubtful whether it could be delivered in this city cheaper than the Wyoming coal, the transportation charges of which amount to thirteen dollars per ton. The distance would be about the same, with the advantage in favor of Wyoming of but a single handling in shipment. Could three hundred tons of coal be delivered in this county daily at twelve dollars per ton, it would take the place of wood and find a ready sale."

Here, then, is a problem for narrow-gauge men to work out and, according to our view, well worth the working out, too. Three hundred tons of coal a day delivered in Storey county, Nevada, at \$12 per ton, or \$3,600 per day, is an amount of trade worth some exertion to secure, more especially when the demand is likely to be permanent, as the Enterprise states "it is doubtful whether coal, of a marketable quality, will ever be found in Nevada."

The only competition to be considered is, as the Enterprise states, that of Wyoming, with Evanston as the point of shipment—688 miles distant from Virginia City. Now the distance from our Southern coal fields to that city, via Pioche, Hamilton, Eureka and Austin, is but 540 miles, a clear gain of 148 miles in distance to begin with, while in cost of transportation the advantages are, of course, in favor of narrow-gauge roads. Another important point which must not be overlooked in the consideration of this matter, is the great superiority of the Southern coal—much of which is said to be anthracite—over the Wyoming coal.

In order to secure this trade and avoid the handling, to which the Enterprise refers, it would be necessary to depart from the plan originally proposed by the Tribune, at least so far as a portion of the route is concerned, and run from Hamilton to Eureka 40 miles, Eureka to Austin 75 miles, and from Austin to Virginia City 186 miles. This, although not a direct route, would probably be the best one, as it would embrace nearly, if not quite all the mining districts, and open up the interior of Nevada, besides furnishing a direct route for the shipment of goods from San Francisco to the points named, which would benefit Pioche and Southern Utah greatly. In addition to the coal trade, which is the basis of our article, we look forward with confidence to the time when the vast deposits of iron ore adjacent to the coal will be so utilized that in manufactured forms it will supply the whole interior basin with railroad iron and mining machinery, making that region the Pittsburgh of Utah.

For diversity and extent of mineral wealth Southern Utah and Southwestern Nevada are unsurpassed in the United States, and certainly there is no better opportunity presented for the investment of capital in railroads than the one to connect Cedar City, in Utah, with Storey county, Nevada.

BLASTING "SEAM DIGGINGS."—The El Dorado Republican says, that it has been a subject of much speculation whether or not the "seam diggings" on the Georgetown divide could be successfully blasted by what are known as "powder drifts;" a large majority believing that the numerous decomposed quartz seams in these claims would absorb the force of the blast and thus render it ineffectual. Consequently no one seemed willing to hazard the expense of several hundred dollars in making the experiment. The California Water Company, becoming interested in several of these claims, and witnessing the heavy expense attending the working of these bed-rock banks without the use of powder, determined to try the experiment. Consequently a powder shaft was made in the American Mining Company's claim, better known as the Smith claim, near Spanish Dry Diggings, one hundred kegs of powder deposited there. It was fired last Thursday, with the most satisfactory results; lifting and apparently crushing an area of about one-half acre to the depth of eight feet. It is believed that this expenditure of a few hundred dollars has saved thousands.

SOUTH AURORA MINING COMPANY, WHITE PINE.—The shareholders of this company met in London, December 21, 1872, according to adjournment, and resolved to go into liquidation, and wind up the affairs of the present company, preparatory to the formation of a new one, for the purpose of purchasing and working mines in the neighborhood of the South Aurora. Liquidators (analogous to our receivers) were appointed, and a memorandum of the new association was read, from which it appeared that the name of the new company will be the South Aurora Consolidated Silver Mining Company, (Limited), with a capital of £300,000, (\$1,500,000,) in 60,000 shares of £5 each. Arrangements will be immediately made for buying up the shares of those holders who are not satisfied to join in the new project. The name of the mining property to be purchased is not made public.

USEFUL INFORMATION.

The Primary Colors.

If we look steadily for a considerable time upon a spot of any given color, placed on a white or black ground, it will appear surrounded by a border of another color. And this color will uniformly be found to be that which makes up the harmonic triad of red, yellow and blue; for if the spot be red, the border will be green, which is composed of blue and yellow; if blue, the border will be orange, composed of yellow and red; and if yellow, the border will be purple, making in all cases a triad of the three primary colors.

With a view to throw such a light upon the subject as my limited opportunities would permit, I tried over the experiments by which Sir Isaac Newton came to the conclusion that there were seven primary elements in the solar spectrum, and the same results occurred; I could not separate any one of the colors of which it seemed composed, into two. The imperceptible manner in which the colors were bleended together upon the spectrum, however, and the circumstance of the colors which practical people called compound, being always found between the two of which they understood it to be composed, together with my previous conviction induced me to continue my experiments; and although I could not, by analysis, prove that there were only three colors, I succeeded in proving to my own satisfaction, synthetically, in the following manner:

After having tried every color in succession, and finding that none of them could be separated into two, I next made a hole in the first screen, in the center of the line of the spectrum, and another in that of red. I had thereby a spot of each of these colors upon a second screen. I then, by means of another prism directed the blue spot to the same part of the second screen on which the red appeared, where they united and produced a violet as pure and intense as that upon the spectrum. I did the same with the blue and yellow, and produced the prismatic green; as also with the red and yellow, and orange was the result. I tried, in the same manner, to mix a simple with what I thought a compound color, but they did not unite; for no sooner was the red spot thrown upon the green than it disappeared.—*Hay's Interior Decorator.*

A VELOCIPED RACE.—A fifty mile race on bicycle velocipedes recently took place at Wolverhampton, Eng., between two experienced riders, Moore and Johnson. Moore, the smaller man of the two, agreed to allow his opponent an advantage of two miles in the fifty. The first fourteen miles were run in 59 minutes and 23 seconds, the advantage being in favor of Moore. At the end of the twentieth mile the race seemed to be over, as Johnson was evidently suffering from having repeatedly to force his high wheel with short crank up hill against the wind. Moore, on the other hand, with small wheel and long crank, had no difficulty in making the ascent. On the twenty-seventh mile Moore passed Johnson for the sixth time, who could scarcely now move his vehicle up the short hill, and, on the twenty-eighth mile, Johnson gave up the race. Moore finished the remainder alone, making the fifty miles in three hours 56 minutes and 40 seconds, and running the last mile quite as quickly as the first.

The above practical trial appears to show an advantage in the small wheel and long crank over a large wheel and short crank in velocipede driving.

FOAMING IN BOILERS.—The *Scientific American*, in reply to the queries of a correspondent, "What causes foaming in an engine boiler? Is it dangerous or apt to cause an explosion of boiler? Does steam ever descend under the water in a boiler and force the water up and then take its place?" answers as follows:—"Foaming is caused by the generation of steam more rapidly than it can discharge itself from the mass of water within which it is formed. It may give rise to inconvenience, and even danger, either by carrying water out of the boiler more rapidly than the feed pump can replace it, or by entering the steam cylinder of the engine and creating a liability to accident, when the piston strikes upon it, at the end of its stroke, by breaking crank pin, connecting rod or cylinder head. Steam does not get under the water but is sometimes so rapidly disengaged, at points on the heating surface under water, as to almost or quite displace the water.

FOR LUBRICATING.—It is stated that a preparation, consisting of one part sulphur to twenty parts of refined colza oil, after undergoing a heat of from 130 to 140 deg. for an hour, furnishes an excellent lubricating material for machinery. The sulphur, being a poor conductor of heat, is thought to assist to a considerable degree in preventing heat from friction.

TO REMOVE NITRIC ACID FUMES.—Whenever nitric acid pollutes the air by its vapors, as in sundry branches of industry, all injurious consequences may be obviated by the free use of ammonia. The vapor of the latter, combining with that of the nitric acid, forms a compound which is inodorous and innocuous.

Change the Law of Process.

Reader, did you ever reflect that all you can do in the physical, mental or moral world is simply to direct pre-existing forces to accomplish change?

To illustrate this proposition, let us follow the history of any article of common use, say the shoes on your feet.

Long ago, in the pre-historic ages, the manufacture of those shoes was begun, and only through ages of progress and infinite change have they been wrought. In the time when "the earth was without form and void," volcanic forces were at work upheaving, degrading, plowing miles deep to prepare a soil for the growth of nutritious plants to support animal life. Then, through slow successive stages, animals and men appeared.

Then followed that curious round of intricate and, as yet, very dimly comprehended processes, whereby crude inert matter is converted first into coarse organic forms of life, and through those into such finely organized, complicated structures as the skin of a mammal.

The tanner takes such a skin, and, by direct chemical affinity in his vats and other physical forces in subsequent operations, transforms it into leather. Then the shoemaker follows, directing, by his skill, muscular power and the operation of machines. At last appears the finished fabric, to subserve the comfort of man.

In this simple illustration is obtained a glimpse of the vastness of all cycles of change, only through which can their be any progress, even in little things.

How much more, then, ye impatient for the time to come, must mental and moral progress be slow; sometimes so slow that the onward march seems stopped, or, perhaps, to retrograde? But this is only the view of cursory observers. When the foundations of society are shaken by war, by the abandonment of long-established usage, when almost anarchy prevails, people are often wont to become pessimists, and to exclaim that the world is getting worse instead of better. But all these disturbances are but the settling of the moral crust of society. By and by the disruptive forces will have expended themselves, and the sides of the chasm shall be transformed into gentle slopes blossoming with verdure, and its mountain peaks shall stand never more to be shaken, only we must wait.—*American Artisan.*

NEWSPAPERS.—More copies of newspapers are printed in a year in the United States than in all the rest of the world together. England and France come next, and the two together have half as many as the Yankee Nation. Asia, Africa and European Turkey, according to "Hudson's New History of the Newspaper Press," together do not publish so many newspapers and periodicals as San Francisco alone. We imagine, however, that his information about Asia must be incorrect, for there is considerable intellectual activity among the Hindoos. It cannot be denied that in this great branch of progress, the Americans have taken the lead in a most remarkable manner.

HOW TO INSERT SCREWS IN PLASTER WALLS.—It often becomes desirable to insert screws in plaster walls, without attaching them to any woodwork; but when we turn them in the plaster gives way and our effort is vain. And yet a screw may be inserted in plaster so as to hold light pictures, etc., very firmly. The best plan is to enlarge the hole to about twice the diameter of the screw, fill it with plaster of Paris, sand, as is used for fastening the tops of lamps, etc., and bed the screw in the soft plaster. When the plaster has set, the screw will be held very strongly.

SETTING TIRES.—A mechanic gives the following method of so putting tires on wagon wheels, that they will not get loose and require resetting. Use a long cast iron pan or dish made for the purpose; line the oil is brought to a boiling heat, the wheels are placed on a stick over the dish, so as to hang in the oil, each fellow an hour. The timber should be dry, as green timber will not take the oil.

CEMENT FOR LEATHER.—Ten parts of carbon bisulphide and one part of oil of turpentine are mixed, and as much gutta percha added as will readily dissolve. The surface of leather must be freed, with a hot iron, from fat, and the parts once joined should be well pressed until they are firmly united.

LINSEED OIL.—A patent has been taken out by a party in England for treating linseed and other seed and vegetable oils so as to give to them all the advantages derived from boiling without having recourse to that process, and to retain other properties unimpaired which boiling destroys.

ZINC WHITENESS.—Mix oxide of zinc with common size and apply it with a brush, like lime whiteness, to the ceiling of a room. After this apply in the same manner a wash of the chloride of zinc, which will combine with the oxide, and form a smooth cement with a shining surface.

BY RAIL FROM MEXICO.—A correspondent of the *German Town Telegraph* remarks that before the Centennial celebration can take place we shall have trains running straight through from the city of Mexico to Philadelphia.

PAPER MONEY which cannot be counterfeited is said to have been invented by a Berlin lithographer.

GOOD HEALTH.

Process of Digestion.

Digestion is the process by which food is prepared for conversion into living blood. This conversion of dead matter into living substance is the greatest and most mysterious power of Nature; yet it is effected by agencies so very delicate that our nicest chemistry fails to detect even so many active elements as it finds in a Homeopathic pellet of aconite or belladonna. The gastric juice, which produces this miracle of transformation, is almost tasteless, and it has no pungency whatever. It certainly affords an example of how very small a dose of the appropriate element is capable of making the most fatal changes in the living process of the human body.

It is not balk nor mechanical consistency that determines the digestibility of food; nor can the law for one stomach be treated as the law for all. The gastric juice is, no doubt, prepared in every stomach of such variety as to take up the food elements required by the existing conditions of the bodily organs, and to reject such elements as are not wanted. Hence, "what is one man's meat is another's poison." General directions as to what should be eaten are like the usual conglomerate pill of the quack, designated for all cases, and useful in none.

Generation is a congressional act, in which every organ of the body is represented. Hence, parent peculiarities are transmissible, and delicate stomachs, torpid livers, and the like, pass from generation to generation. No doubt digestion is also a congressional act, the gastric juice being a contribution representing the wants of each organ in the body. It is not, then, the bulk one eats, but the kind of food, which, according as it responds to those wants, sits easily on the stomach and gives good digestion. Dyspepsia is the error of injudicious supplies. Theory avails nothing, and general dietetic rules are mockery. Every man must, by experiment, determine for himself.

Some change of food is imperative. Tea, coffee, cabbage, hot bread, the wheaten loaf, pan-cooked pork, salt meat, pastry, etc., may be retired in turn. Rum and tobacco must not go unchallenged; and all private indulgences may be moderated in the experiment. Three meals a day inflict twelve hours' labor on the stomach. Dyspepsia is, perhaps, its mode of striking for eight hours' work, or two meals a day; and its promise may be honest that it will digest as much nourishment for you in eight hours as in twelve, and do it to the greatest profit of the whole body corporate. Don't refuse it a hearing, but give it a fair trial, with reasonable hopes of the restoration of health and harmony.

Listen to no man who proclaims this wholesome, and that not, unless the counsel come from a physician who can give reasons for his advice. Distrust him who tells you to avoid hard and to eat soft-boiled eggs, because the one is hard to digest and the other easy, and to abhor cheese as indigestible altogether. Dr. Leube, of Erlangen, has thoroughly tested the gastric juice of many stomachs, and he finds ripe cheese more digestible than eggs in any form, and well-boiled eggs are better than soft ones.

We would prescribe good nature as an essential element in the cure of dyspepsia. But we know that, with such sickness (as Burns says): "Tis hardly in a Body's power To keep at times free feeling dour."

Labor, then, to right the body, and the body will right the mind. By a process analogous to the conversion of dead matter into living tissue, it seems as though the living body finds the elements for its mental manifestation; for good nature is the product of a healthful balance among the co-working organs of the body. It is also a peculiar function of Homeopathic medicines to adjust, with the least disturbance, the delicate balance upon which hangs the life of health in the body and sanity of the mind. *Ex.*

A NEW IDEA IN BATHS.—A correspondent of one of the English medical journals has taken a sand-bath, and this is his description of the process:

The patient is introduced into a warm, comfortable room, in which is a bath, fenced round with curtains, filled with sand heated to about 100° to 120°. In this a longitudinal groove (I will not say grave) is scooped to receive the patient, who is wrapped in a sheet, and so protected from contact with the sand. There is a comfortable pillow for the head. Then the bath operator gradually covers up feet, legs, arms and trunk with the warm sand. A bucket of hotter and one of cooler sand are at hand, so that the temperature can be adjusted with the greatest nicety. The feeling of warmth is very agreeable, and the weight of the sand is just enough to cause a pleasant sense of compression and support. After an hour's delightful repose, the patient rises, is refreshed by a sluicing of hot water, and goes away refreshed.

The effect is very different from that of hot water, and still more from that of hot air or steam. There was absolutely no commotion of the heart, nor any of the grilling effect on the windpipe which I have experienced in other baths. Altogether, it seems a good thing when we want to produce measured perspiration and relieve congestion of the internal organs.

A NEW FEVERIFUGE.—The *Constitutional* announces the discovery of a new febrifuge, which has been found an excellent substitute for quinine. As the latter is very costly—too much so for the purses of workmen and peasantry who are so frequently the victims of fever—it will be a general boon if the new drug, which is said to possess all the properties of quinine, and which will cost very little, can be brought into use among the public. M. G. Doray, an apothecary in Saint-Lo, it seems, remembering the good effects in certain fevers of bitter aromatics, as, for example, camphor, conceived the idea of trying the action of the laurel, the leaves of which are at once bitter and aromatic. The experiments were conclusive as to its powers, for according to statements made to the Academy of Science and the Academy of Medicine, three grammes of powdered laurel leaves suffice to work a cure. All the fevers treated by the new drug have given way (it is said) in a few days, and it has even been successful in an African fever of long standing, against which sulphate of quinine has proved powerless. The laurel is common in France, and produces no bad effects, so that if its use were general the French would no longer depend on the New World for quinine. Intermittent fevers are very common in France, so that if the medical profession should adopt the new febrifuge after fully testing its properties, it will prove an immense advantage to the population. The green leaves of the laurel (*Laurus nobilis*) are dried by a gentle heat on the fire in a close vessel, to prevent the loss of the volatile elements, and are afterwards reduced to a fine powder, one gramme of which in a glass of cold water may be taken as a dose. The effects of so simple a drug may at least be easily tested.

FAT AND LEAN.—Meat eaters and vegetarians show in their persons the effects of the diet. The first has the most brain force and nervous energy. A mixed food of animal and vegetable rations develops the highest intellectual powers. A strictly vegetable living ordinarily gives a fair complexion, and amiability and extreme pugnacity when the vegetarian's views in regard to that one engrossing thought of his life are discussed. They are annual-meeting reformers, without ever setting a river on fire. Arabs are a sober, frugal race, rather slender, not tall, conscientious and contentious on religious subjects. They largely subsist on rice, pulse, milk and keimac, something similar to whipped cream, through a vast region of an arid country where they are indigenous. They are not destitute of mutton, goats, camels and game; but they manifest no disposition to feed upon meats, as is necessary in temperate zones or in high northern latitudes. An intellectual man, one of their kindred, who rises to distinction by the grandeur of his mental stature, is extremely rare. The beer and ale drinkers expand and grow fat, but they are not much given to profound researches in science.

DIETETIC HINTS.—Most chronic diseases, and many acute ones, are produced at the table. As a rule, no fluid of any kind should be taken at the table, especially if the stomach is weak. The stomach should never be overloaded; not more than two or three articles should be taken at one meal; no stimulants used before eating; tobacco arrests digestion. Milk is the best diet for infants and children. Tomatoes with cream and sugar are healthy and nutritious. Bread and butter is the staff of life, and easily digested. Too much salt irritates the stomach. Colds are frequently produced by drinking hot tea and exposure afterwards. Late suppers induce heart disease. Pastry and cake constipate the bowels. Boiled potatoes are not so healthy as baked ones. Fruits are to be eaten at breakfast and dinner. The stomach requires much rest to be healthy; purgative medicines weaken the bowels. Cheerful conversation promotes digestion; end anger prevents it.

COLOR-BLINDNESS.—An instrument has been invented in Germany for testing color-blindness. It consists of a rotating apparatus, which moves a disk whose center is a circle, one half black and the other white; outside of this is a ring of violet and red, then the outside ring of violet and green. When rapidly rotated, the centre appears to be colored grey, that is white and black mixed. To a green-blind person the middle ring will appear grey, that being the result to him of a mixture of violet and red. The outer ring will appear grey to the red-blind patient, and the inner grey to the violet-blind. By the use of this instrument, a large number of patients may be simultaneously examined for one or more kinds of color-blindness.

BREATHING FOUL AIR.—When breathing air that is dirty, ill-smelling, or otherwise impure, the breath should be drawn in slowly through the nostrils—never through the mouth. In this way the dust and other impurities are mostly lodged in the passages of the nostrils, from which it is readily expelled, and kept from the lungs. People ought always to breathe through the nostrils. A person's life is, in almost all cases, thereby greatly lengthened.

SOUR STOMACH.—Alkali is used in Allopathy to correct acidity of the stomach; but Homopathy corrects it better by small doses of lemon-juice. "I have known many persons," says Dr. Dio Lewis, "who had long suffered from heart-burn or water-brash, cure themselves by a few drops of lemon-juice after a meal."



B. EWER.....SENIOR EDITOR

DEWEY & CO., Publishers.

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Office, No. 338 Montgomery St., S. E. Corner of California St., diagonally across from Wells, Fargo & Co.'s.

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San Francisco:

Saturday Morning, March 1, 1873.

Legal Tender Rates.—S. F., Thurs., Feb. 27.—buying 88; selling 88½.

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LITTLE COTTONWOOD RAILROAD.—A bill to incorporate the Little Cottonwood Railroad and Telegraph Company, as amended and recommended to the Honss Committee on Pacific Railroads, provides for a continuous route from Sandy Station on the Utah Southern Railroad, through Grants City and Tannersville to Alta City, in Little Cottonwood Cañon, with this right to build a branch to the Big Cottonwood, and collateral lines not exceeding twenty miles from this main line; the principal office to be in Pittsburgh, Pennsylvania; this capital stock of the Company \$5,000,000.

TRANSIT OF VENUS.—Our Government will shortly be called upon to give an example of its generosity in aiding the cause of science to the extent of \$100,000. Aean "amendment to sundry civil appropriation bills", a provision has been introduced, providing for the organization, by the Secretary of War, of parties to observe the transit of Venus on December 1874. The amendment authorizes a detail of two vessels of war for the transportation of parties to the Pacific and Atlantic stations, and appropriate \$100,000 to defray expenses.

DEATH.—Mr. A. H. Bangle, the inventor of an improved printing press, died at his residence in Brooklyn, Cal., on Wednesday last. He was a very worthy man.

COAL.—A new coal vein, eight feet wide, has been opened at Widefield on the Denver and Rio Grande Railroad, 12 miles from Colorado Springs.

THE RECEIPTS of the San Rafael and San Quentin Railroad company for 1872 were \$19,152; expenses \$15,435.

COAL is to be used in Pioche from the mine of the Wasatch Co. in Utah, as soon as the roads will permit hauling.

THE WELSH miners' strike is reported to be over and about 60,000 of the strikers have returned to work.

MINING sales in Colorado are quite frequent of late at heavy prices. The Caribou mine is said to have sold for \$1,500,000.

Amalgamation of the Precious Metals.

The recent lecture by Eugene N. Riotté, before the Polytechnic Class on the subject of "Amalgamation—with special references to the Pacific Coast" was an interesting one, particularly to the mining community.

Literature.

Mr. Riotté opened his lectures by referring to the literatures of Amalgamation, saying there were but two works on the subject, both of them already old. One is Wrinkler's—"The European Amalgamation of Silver Ores," published in 1848 and never translated. The other is "Kustel's Processes of Gold and Silver Extraction," published (by Dewey & Co.) in San Francisco in 1863. Although this principles of amalgamation as there laid down are still the same, still the practice has since changed materially.

History.

Far back in the dark ages was known this property of quicksilver to combine with the different metals, but especially with gold and silver to form alloys or amalgams which could again be decomposed simply by heat. This property has been employed to extract gold and silver from ores and products and the peculiar metallurgical operation resulting has been termed amalgamation. At first the process was only used to extract metallic or native gold from gravel, sand, soil, etc., or from sweeping, but it was also employed on ore containing free gold. As the ores to his works grew poorer and poorer, or chemically more complicated, the simple mortars, pots, or pans, elucies, riffles, long-toms, etc., by which the process was carried on, became more extensive. Large mills and chemicals, salt, vinegar, etc., were used in grinding the ore and quicksilver together. At the commencement of the 14th century in one district in Bohemia, 350 gold mills were in operation.

This amalgamation of silver ores did not come into use so early or so generally; only few ores could be worked, as the minrelized silver could not be extracted for a long time; but in the middle of the 16th century, Bartolomeo de Medina, a Mexican, succeeded in this also. Velasco took it to Peru in 1588 and Cordova attempted to introduce it into Austria, but failed. For two hundred years after this silver amalgamation reeted in Europe. In the United States Barhae's process was introduced which employed pans and chemicals. It saved quicksilver but did not get so much silver, as Medinas' method, which caused a successful opposition in America; Von Born obviated this defect by a careful preparation of the ore. He first roasted it with salt and then amalgamated it in copper pans, under which a fire was maintained. The ore was stirred with wooden rakes, and after 20 hours poured into a settler, the gangue worked off, quicksilver streined and amalgam retorted. This is the entire theory as it stands to-day; but this practice has been changed and rechanged.

In 1784, Von Born made some public trials, which foreshadowed a great reduction in the cost of working silver ores. Metallurgical ambassadors flocked to Vienna, and as a result mills were built in many places. Jellert, the director of the reduction works at Freiberg, Saxony, about this time found by experiment that the ore became hot without fire under the pans, if stirred violently in a wooden cylinder. The building of the 40-pan mill at Freiberg was stopped until his experiments were concluded. The mills in Hungary were soon changed from the poisonous, hot amalgamation process to Jellert's process of cold amalgamation in wooden cylinders. And now in 1789 a large mill was commenced, with horizontally revolving barrels devised by Ruprecht, and the best amalgamative process to this day was invented. But all these scientific and practical men based the explanation of so great an invention on fallacy. They thought only metallic silver would amalgamate, and that it was metallic silver that was formed in the Pateo by magistral and in the furnace by salt. Lampadius proved that it was chloride of silver that was wanted, and what had really been formed during the preliminary washing. And to this day we have got no further.

The speaker said that you ought to take this slight sketch and substitute well known names and places in California and Nevada, and you have the history of amalgamation here. The euphousous Alonzo Barhae's process becomes plain "Smith's pans," etc. In speaking of the way things were done

On the Pacific Coast,

Mr. Riotté said: How often may you not hear the remark in regard to the ore from new localities, or new combinations, "If we could only find out how to work our ores;" or, better still, "There is no way to get at the silver;" all of which is very silly. Give the metallurgist the price of labor, wood, salt and freight at any given point, and the way or ways of working can be told with mathematical certainty. Then a test must be made, not by a quack, but by a scientific and practical experimenter, who is at the same time thoroughly honest. The mistakes may all be accounted for. You must remember one little maxim: "Don't build mills before you have ore and don't experiment as to how ore should be worked with a \$100,000 quartz mill, with an ass, or worse, a knave at the head of it. Now let me lay down a few

General Principles of Amalgamation.

First, it is a settled fact that gold needs friction, and silver chemical action. Gold is in a native or metallic state in this ore and can only be extracted in this form. It is therefore necessary to connect it and the quicksilver very intimately to make the two combine or one dissolve in the other; it is a purely mechanical operation and upon its mechanical perfection reests its success. Remember again that only metallic gold will amalgamate, everything to the contrary notwithstanding.

Silver must enter the pans or barrels as a chloride; from this compound it is either precipitated by quicksilver and chloride of mercury and silver formed which is immediately taken off by the surplus quicksilver, or it is precipitated by the iron and simultaneously amalgamated. This is a chemical action, during the progress of which heat is evolved, which like the acid solution of salt, aids the decomposition. Galvanic effects are produced which suffice to explain the results in harrs or pan.

Chemicals added during gold and silver amalgamation are often dangerous, always detrimental and never of any use. Kustel says: "In regard to chemicals, after several months at Col. Raymond's mill on the Cersour river, experience proved that the use of chemicals is entirely useless: I am prepared to prove this by actual experience." Wrinkler proved the same ideas in regard to the large addition of magistral. In gold ore amalgamation any and all chemicals have only the effect of reducing the fineness of the hullion and costs much money.

In silver amalgamation the addition of salt and sulphate of copper seems to hasten amalgamation at first, but is liable to stop it too soon, and then the galvanic reaction necessary, cannot again be produced. No more silver is produced than without them, the hullion is less fine, and quicksilver is lost by "flooding" in proportion to the chemicals employed. A notable exception to this is working slimes from the Comstock. In this case chemicals are employed to advantage, but have a mechanical action. The slimes are, when put in a pan and mixed with water, difficult to "temper," that is, to mix to such a consistency that the action of the mullers of the pan will throw the quicksilver finely divided into the ore. No results can be obtained from a pan that is not "tempered." We have here, as before, an entirely mechanical operation to deal with. The particles of gold and silver must be brought in contact. Now a mixture of salt or sulphate of copper, or either singly, finely divides the quicksilver that is shaken with it, which is what we wanted. No matter how poor the workmanship in tempering you have become independent of it. In the

Mechanical Appliances

For the use of Barhae's or Von Born's process, we have made immense strides recently. Instead of 200 or 300-pound pans we have the Stevenson 6,000-pound, or even Park's 20-ton cast iron pan, that finishes a charge every six hours.

In raw amalgamation, fancy, or the size of the purse still govern the size of the pan. The simplest and cheapest is the best. Don't be deceived by the catch-word "it is a great grinder." This is just what you don't want. Powder your ore under stamps, which is the machinery for crushing, not the pan. Stamps will crush for one-tenth the cost in one-tenth the time. The pan that "is a great grinder" will also grind your quicksilver and make it "flour." Rubbing would be a much more needed faculty; this is what is needed in a pan. For

roasted ore the selection of pane is narrowed down to one or two. Only the "Combination pan" contains all points.

"Future Processes."

May we hope that the days of amalgamation of roasted ore are numbered. We are now 50 years behind the age. Nowhere, except here, is it now practiced; melting furnaces and leaching tubs have long ago superseded the hulk machinery needed for amalgamation. Where we can chloridize up to 95 per cent. and mors, we are but amalgamating up to 90 per cent. Two, three, and even ten per cent. of the silver already in our grasp is thrown away by this costly, ponderous, but simple process. We know how to do this, and to learn anything new is fearfully difficult. Let us raise up a generation of young men who are willing to devote a life's study and purpose to mining and metallurgy and we will soon overtake and pass the balance of the world.

Australia and New Zealand.

The wonderful island continent of Australia, with its neighboring islands of Tasmania and New Zealand, contain on their shores, washed by the waters of the Pacific, many fine ports and harbors now the seats of flourishing cities and towns. The area of Australia, Tasmania and New Zealand is about equal to that of the United States, but the circumstances of soil and climate are very different. By much the greater part of Australia is hot and dry with a deficiency of navigable rivers, and of arable land. There are immense tracts, however, on the east and north suited to the culture of Sugar, Cotton and other tropical productions, a tract as large as the whole of the Pacific Coast. Three-fourths of the remainder will have to be devoted to sheep husbandry. From this may be predicted the nature of the commerce that will in future subsist between San Francisco and the trade ports of Australia. We shall have to supply a population as large as the United States with Wheat and all the various productions of the temperate climates of this Coast, and we shall in return be purchasers of their Cotton, Sugar and Wool, which we will manufacture and distribute abroad to the world.

QUICKSILVER.—If Napa county proves as prolific in quicksilver as it is in "quicksilver mine" we will surely see the speedy downfall of the Rothschild-Barron monopolise throughout the world, and especially on this coast. The product of the county is as yet, however, quite limited, but judging from recent reports it will be materially augmented before long. We are informed by the Register that a vein of ore was struck a few weeks since that promises to be the richest yet found. It is being drifted upon and shows a free show of rich ore. If even a very small proportion of the locations made are worked and prove by their product to be valuable, Napa county ought to do well in the quicksilver trade, without having to put her minss in the London market.

COPPER PRODUCT OF LAKE SUPERIOR MINES.—From a detailed statement of the production of copper of Lake Superior mines in the Marquette Mining Journal, we learn that the total for the year 1872 was 15,166 tons, a decrease of 905 tons from 1871 when the production was 16,071 tons. This total copper (mineral) product of the mine from 1845 to 1873 is 176,395 tons. An approximate statement of ingot copper produced and its value from 1845 to 1872 inclusive gives a total of 135,075 tons, valued at \$76,303,320. The dividends declared by mining companies in 1872 amounted to \$3,390,000, while the assessments were only \$190,000, leaving an excess of dividends over assessments of \$3,200,000. The total dividends declared by mines at Lake Superior aggregate \$11,910,000.

A SEQUEL TO THE DIAMOND FRAUDS.—Everybody remembers the big diamond fizzle of last year, and meet probably the names of prominent parties, with ewindlers or ewindled, who had any connection with it. The whole affair was thoroughly investigated by the press and comments made upon the actions of those who were at all connected with the affair. Wm. M. Lent who alleges that he lost by the whole transaction the sum of \$250,000, has sued the Territorial Enterprise for publishing an alleged libellous article which accuses Mr. Lent of being fraudulently implicated in the Arnold etock diamond swindle. Mr. Lent aeks for \$15,000 damages from Jas. T. Goodman, editor of the Enterprise.

A HEAVY snow slide occurred in Little Cottonwood on the 26th ult., and the roads blocked but no lives lost.

The Probable Periodicity of Rainfall.

At the last meeting of the California Academy of Sciences, the President, Professor George

Davidson, of the U. S. Coast Survey, read a paper on "The Probable Periodicity of Rainfall," which was accompanied with diagrams illustrating the average of rainfall in California for 23 years, and which, as it is a subject of great interest, we publish with this cuts. Professor Davidson said: Many attempts have been recently made to establish a periodicity of rainfall commensurate with the eleven year period of the solar spots. In limited cases the law has appeared to prevail, but in cases as apparently reliable the results have been adverse. In an extended series of observations of the rainfall in England, stretching through 150 years (British Association Report for 1866) no such maxima and minima could be deduced; and in a series of observations, over various parts of the globe, gathered by G. J. Symons, in number 165 of *Nature*, the same want of law is manifest; in fact, where maxima of rainfall should be expected, we find minima, and vice versa. These tables are, however, too limited to deduce a general law therefrom. The materials are at hand for a much more comprehensive treatment of the problem.

But if there is a law in such cases isochronous with the exhibition of the sun spots, it must be qualified by other variable functions than rainfall; such as the temperature and pres-

sure of the atmosphere, the amount of aqueous vapor in the atmosphere, the direction and force of the winds, and the climatology, not only of the adjacent ocean, but of the sources of the great currents that cross the ocean. For example: if the rainfall of the Western Coast of Europe is assumed dependent upon the same causes which occasion the solar spots, the epochs of the maxima and minima rainfall would not coincide with those of the solar spots, because the precipitation of rain and the temperature of the seaboard of Ireland, Scotland, Norway, Iceland, Spitzbergen, etc., depend upon the temperature of the Gulf stream bathing those shores; and the waters of the Gulf of Mexico heated to a maximum at a given epoch would not reach the coast of Norway for possibly a year. The same is true of this Coast; the heated waters of the great Japan stream, at their point of departure at the Island of Formosa do not reach this Coast for more than a year. Thus whilst these superheated waters are delayed one year in reaching their destinations, the climatic conditions of the Coasts of Norway and of California, supposed to be governed by a regular law, have been changed and the problem is complicated and masked by these changes in the nearer effects of the climate of the adjacent continents; and in the European case, of the Polar Basin.

If there is a law of the rainfall, there will naturally be a similar law for the temperature and pressure of the air and for the winds; but it must be complicated and masked by the influence of great ocean currents, so that the problem instead of being simple, as it first appears, is in reality very intricate.

An attempt has been made to give an eleven year period to the cyclones in connection with the rainfall, but evidently upon insufficient data, for Mr. Meldrum only claims that a supposed periodicity has been made out. Lockyer (*Nature*, No. 163) in discussing Mr. Meldrum's records and others at Madras and the Cape of Good Hope, sees in them indications of a periodicity, but his discussion is merely tentative from insufficient materials and is not satisfactory.

The same eleven-year period has been assigned to the seasons of great freshets in California; but we need, what we cannot ob-

tain, absolute observations over extended areas, and not mere reports to aid in its establishment. The statement was common in the west that the greatest freshets occur on the great rivers of the Western States about every ten years.

I have had placed in graphical order the rainfall at San Francisco for 23 years, from Mr. Thomas Tennent's observations and exhibit it to show that we cannot, from it alone, predicate any periodicity. Even the well marked short period of comparatively little rainfall and of clear weather during each of our wet seasons is masked in the averages of monthly rainfall in these years by its not occurring at any well defined epoch. But its existence is well marked and established in the illustration of the monthly rainfall from 1849 to the present.

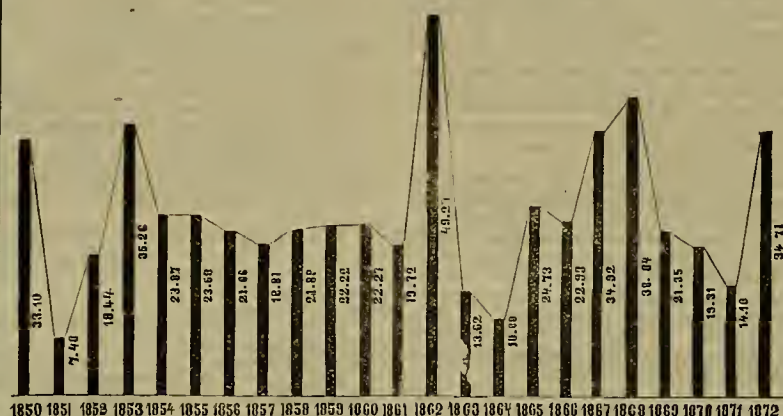


FIG. 1—YEARLY RAINFALL AT SAN FRANCISCO FOR 23 YEARS.

sure of the atmosphere, the amount of aqueous vapor in the atmosphere, the direction and force of the winds, and the climatology, not only of the adjacent ocean, but of the sources of the great currents that cross the ocean. For example: if the rainfall of the Western Coast of Europe is assumed dependent upon the same causes which occasion the solar spots, the epochs of the maxima and minima rainfall would not coincide with those of the solar spots, because the precipitation of rain and the temperature of the seaboard of Ireland, Scotland, Norway, Iceland, Spitzbergen, etc., depend upon the temperature of the Gulf stream bathing those shores; and the waters of the Gulf of Mexico heated to a maximum at a given epoch would not reach the coast of Norway for possibly a year. The same is true of this Coast; the heated waters of the great Japan stream, at their point of departure at the Island of Formosa do not reach this Coast for more than a year. Thus whilst these superheated waters are delayed one year in reaching their destinations, the climatic conditions of the Coasts of Norway and of California, supposed to be governed by a regular law, have been changed and the problem is complicated and masked by these changes in the nearer effects of the climate of the adjacent continents; and in the European case, of the Polar Basin.

This is on a scale of inches one-half that of Fig. 2. In this the break in the wet season of most of the years is plainly marked, but it does not occur with any regularity as to time.

To arrive at a law of periodicity in atmospheric phenomena will demand a comprehensive scheme of observations over a large extent of the earth and ocean; this scheme to involve all the conditions of atmospheric variations and the local relations of each station to the whole, and be represented in graphical rather than in numerical order.

I believe in the law of periodicity of these phenomena, but it will be found an intricate

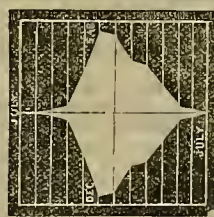


FIG. 3—AVERAGE MONTHLY RAINFALL FOR YEARS.

problem and is doubtless involved with such conditions as the lunar cycle of 19 years, etc. As stated in my paper last year upon "the Cosmical Origin of Physical Phenomena on the Surface of the Earth," we must expect abnormal exhibitions of these phenomena from the irregular exhibition of the materials burning upon the surface of the sun; but in a prolonged series of spectroscopic observations of solar phenomena and observations of physical phenomena on the earth, we will eventually arrive at the law of their recurrence.

SENATE COMMITTEE ON PATENTS.—The Senate Committee on Patents have reported adversely on extending Goodyear's patent on hard rubber. The principal application of this is to plates for artificial teeth, and the extension was opposed by most of the dentists throughout the country. The bill to extend Jenkin's patent for combining wrought and cast iron in ornamental railing, cornices, etc., was reported favorably. The committee has declined to consider any further applications concerning patents at this session.

PATENTS & INVENTIONS.

Telegraphic List of U. S. Patents Issued to Pacific Coast Inventors.

[RECORDED OFFICIALLY FOR THE MINING AND SCIENTIFIC PRESS, DEWEY & CO., PUBLISHERS AND U. S. AND FOREIGN PATENT AGENTS.]
By Special Dispatch, Dated Washington, D. C., Feb. 25th, 1873.

FOR WEEK ENDING FEBRUARY 11th, 1873.

RAILROAD TRACK.—Alexander D. Rock, Hamilton, Nev.

STRAW FEEDING ATTACHMENT FOR FURNACES.—David Morey, Watsonville, Cal.

TRADE MARK.

MEDICINAL COMPOUND.—Emil Frese, S. F., Cal.

—The patents are not ready for delivery by the Patent Office until some 14 days after the date of issue. NOTE.—Copies of U. S. and Foreign Patents furnished by DEWEY & CO., in the shortest time possible (by telegraph or otherwise) at the lowest rates. All patent business for Pacific coast inventors transacted with greater security and in much less time than by any other agency.

CENTRAL PACIFIC RAILROAD CO.—The annual report of the Central Pacific Railroad Company for 1872 shows that the receipts for transportation of passengers, freights, mails etc., exceeded the receipts of 1871 by \$2,836,538. The capital stock of the road is \$100,000,000 of which the amount actually paid in is \$54,283,190. The total amount expended for the purchase of lands is \$906,100; for the construction of the road \$131,609,304; for buildings \$1,126,857; for engines \$2,106,164; for cars \$3,516,208. The amount received for transportation of passengers, mails etc., was \$4,563,551 in U. S. currency and \$7,400,089 in gold coin. Freight transported 948,114 tons. The current running expenses of the road for the year were \$9,271,721. The number of engine houses and shops and of engines and cars, is as follows, to wit: 11 engine houses, 11 repair shops, 184 locomotive engines, 223 passenger cars, 25 baggage cars, 15 mail and express cars, 3,194 freight cars, 110 dump cars, 222 hand cars, 179 section cars, 51 iron cars, 7 snow plows, 2 wrecking cars.

LECTURES FOR WORKING MEN.—The Wednesday evening lectures of Dr. E. S. Carr in the Chemical Lecture room of the State University, Oakland, are highly appreciated by full and attentive audiences. We have never before noted so valuable a course of free lectures delivered by one lecturer. His practical and interesting lessons will prove of much benefit, and he long remembered by his intelligence-seeking auditors.

NARROW GAUGE.—In the Nevada Legislature, Senator McCoy, of Lander Co. has introduced a bill providing for the construction of a narrow gauge railroad from Palisades, near the line of the Central Pacific to Eureka, Lander Co., a distance of about ninety miles. It authorizes Lander County to issue bonds to the amount of \$300,000 to aid the construction of the road.

A SMALL RAILROAD.—At the Royal Arsenal in Woolwich, a small miniature locomotive engine is used to draw trucks carrying altogether about 20 tons of metal. The track has a gauge of only 18 inches. The railroad is intended to supersede as far as possible the transit of heavy loads by contract horses and is of great convenience about the works.

A PROJECT is being discussed of running a tunnel in Lassen county from Willow Creek valley to tap the waters of Eagle Lake, a distance of one mile, which operation will not only supply water for large agricultural operations, but make available, valuable mineral lands now worthless.

THE QUESTION of a narrow gauge railroad from Santa Barbara to Soledad Pass is being agitated by the Santa Barbara Press. The distance is only 70 miles, and the Press says one man, Colonel W. W. Hollister, for instance, could build and own the road, without seeking aid from outside parties.

MEXICO'S FIRST RAILROAD was put in operation on the 1st of January, 1873; it runs from the city of Mexico to Vera Cruz. On some portions of the road the grades are very steep, but the peculiarly constructed engines and brakes allow the trains to make the ascents and descents without difficulty.

FRANCE sent last year 52,000 tons of rails to other countries notwithstanding the natural depression of industry after the late war.

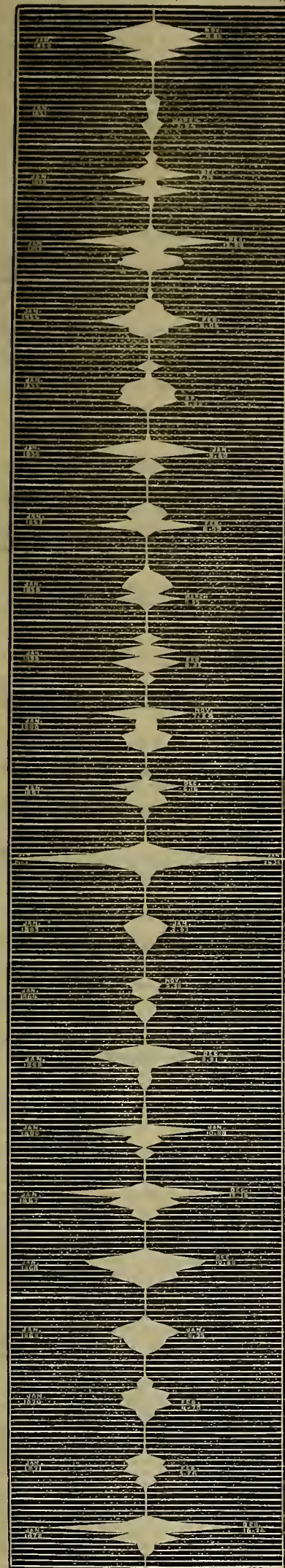


FIG. 2—MONTHLY RAINFALL AT SAN FRANCISCO FROM 1849 TO 1872.

Laws Under New California Code—Taking Effect Jan. 1, 1873.

(Continued from page 106.)

Title I to apply to all corporations, with certain exceptions.)

403. The provisions of this Title are applicable to every corporation, unless such corporation is excepted from its operation, or unless a special provision is made in relation thereto inconsistent with some provision in this Title, in which case the special provision prevails.

Note—

An Act in relation to foreign corporations.
(Approved April 1, 1872.)

(Enacting clause.)

Section 1. Every corporation heretofore created by the laws of any other State and doing business in this State shall, within one hundred and twenty days after the passage of this Act, and any corporation hereafter created and doing business in this State, within sixty days from the time of commencing to do business in this State, designate some person residing in the county in which the principal place of business of said corporation in this State is, upon whom process issued by authority of or under any law of this State may be served and within the time aforesaid shall file such designation in the office of the Secretary of the State; and a copy of such designation, duly certified by said officer, shall be evidence of such appointment; and it shall be lawful to serve on such person so designated any process issued as aforesaid. Such service shall be made on such person in such manner as shall be prescribed in case of service required to be made on foreign corporations, and such service shall be deemed to be a valid service thereof.

Sec. 2. Every corporation created by the laws of any other State which fail to comply with the provisions of the first section of this statute shall be denied the benefit of the statutes of this State limiting the time for the commencement of civil actions.

Sec. 3. Every corporation created by the laws of any other State which shall comply with the provisions of the first section of this statute shall be entitled to the benefit of the statutes of this State limiting the time for the commencement of civil actions.

Wagon Road Corporations.

(Three Commissioners to act with Surveyor.)

512. Three Commissioners must act in conjunction with the Surveyor of the corporation, two to be appointed by the Board of Supervisors of the county through which the road is to run and one by the corporation, who must lay out the proposed road and report their proceedings, together with a map of the road, to the Supervisors who appointed them, as provided in the succeeding section.

(Survey and map to be filed and approved by Supervisors.)

513. When the route is surveyed, a map thereof must be submitted to and filed with the Board of Supervisors of each county through or into which the road runs, giving its general course and the principal points to or by which it runs, and its width, which must in no case exceed one hundred feet, and the Supervisors must either approve or reject the survey. If approved, it must be entered of record on the journal of the Board, and such approval authorizes the use of all public lands and highways over which the survey runs; but the Board of Supervisors must require the corporation, at its own expense, and the corporation must so change and open the highway so taken and used as to make the same as good as they were before the appropriation thereof; and must so construct all crossings of public highways over and by its road, and its toll gates, as not to hinder or obstruct the use of the same.

(Tolls, etc., to be collected. Penalty for taking unlawful tolls.)

514. All wagon road corporations may bridge or keep ferries on streams on the line of their road, and must do all things necessary to keep the same in repair. They may take such tolls only on their road, ferries, or bridges as are fixed by the Board of Supervisors of the proper county through which the road passes or in which the ferry or bridge is situate, except that in the counties of Trinity, Shasta, Klamath, Butte, Siskiyou, Del Norte, Plumas, Humboldt and Sierra, the Directors may fix their own tolls; but in no case must the tolls be more than sufficient to pay fifteen per cent. nor less than ten per cent. per annum on the cost of construction, after paying for repairs and other expenses for attending to the road, bridges, or ferries. If tolls, other than as herein provided, are charged or demanded, the corporation forfeits its franchise, and must pay to the party so charged, one hundred dollars as liquidated damages.

(No tolls to be charged on highways or public roads.)

515. When any highway or public road is taken and used by any wagon road corporation as a part of its road, the corporation must not place a toll gate on or take tolls for the use of such highway or public road by teamsters, travelers, drovers, or any one transporting property over the same.

(Rates of toll to be posted at gate.)

516. The corporation must affix and keep up, at or over each gate, or in some conspicuous place, so as to be conveniently read, a printed list of the rates of toll levied and demanded.

(Toll gatherer may detain persons until they pay toll.)

517. Each toll gatherer may prevent from passing through his gate persons leading or driving animals or vehicles subject to toll, until they shall have paid, respectively, the tolls authorized to be collected.

(Toll gatherer not to detain any person unnecessarily.)

518. Every toll gatherer who, at any gate, unreasonably hinders or delays any traveler or passenger liable to the payment of toll, or demands or receives from any person more than he is authorized to collect, for each offense forfeits the sum of twenty-five dollars to the person aggrieved.

(Persons avoiding tolls to pay five dollars.)

519. Every person who, to avoid the payment of the legal toll, with his team, vehicle, or horse, turns out of a wagon, turnpike, or plank road, or passes any gate thereon on ground adjacent thereto, and again enters upon such road, for each offense forfeits the sum of five dollars to the corporation injured.

(Penalties for trespasses on property of corporation.)

520. Every person who:

1. Willfully breaks, cuts down, defaces, or injures any mile stone or post on any wagon, turnpike, or plank road; or,
2. Willfully breaks or throws down any gate on such road; or,
3. Digs up or injures any part of such road or anything thereunto belonging; or,
4. Forcefully or fraudulently passes any gate thereon without having paid the legal toll;

For each offense forfeits to the corporation injured the sum of twenty-five dollars, in addition to the damages resulting from his wrongful act.

(When capital invested is repaid, tolls to be reduced, etc.)

521. The entire revenue derived from the road shall be appropriated; first, to repayment to the corporation the costs of its construction, with fifteen per cent. per annum interest thereon, together with the incidental expenses incurred in collecting tolls and keeping the road in repair. When the repayment is completed, the tolls must be so reduced as to raise no more than an amount sufficient to pay incidental expenses and to keep the road in good repair.

(May mortgage and hypothecate corporate property.)

522. The corporation may mortgage or hypothecate its road and other property for funds with which to construct or repair their road, but no mortgage or hypothecation is valid or binding unless at least twenty-five per cent. of the capital stock subscribed has been paid in and invested in the construction of the road and appurtenances, and then only after an affirmative vote of two-thirds of the capital stock subscribed.

(This Title applies to natural persons as well as corporations.)

523. When a wagon, turnpike, or plank road is constructed, owned, or operated by any natural person, this Title is applicable to such person in like manner as it is applicable to corporations.

(How organized.)

Land and Building Corporations.

639. Corporations organized under Subdivision 11 of Section 286 may raise funds in shares not exceeding two hundred dollars each, payable in periodical installments. Such bodies are known as land and building corporations, and may be organized with or without capital stock.

(May borrow money.)

640. Any such corporation may borrow money for the purpose of carrying out its objects, and may give as security therefor its shares or mortgage upon its real estate.

(Power and object of the corporation.)

641. Any such corporation may purchase real estate and erect buildings for its members, and make loans to its members for the purpose of aiding them in acquiring and improving real estate. Such loan must in all cases be secured on such real estate.

(May insure the lives of members and debtors.)

642. Such corporations may insure, in some life insurance company incorporated

under the laws of this State, the lives of its members and debtors. In case of the death of a debtor or member so insured, the amount recovered on the policy must be applied to extinguish the indebtedness, including the premium paid, and the residue, if any, must be paid to the legal representatives of the decedent.

(What real estate may be owned at any one time.)

643. Any such corporation may purchase, hold, and convey real estate, as follows:

(Liability of shareholders for debts.)

646. Every present and past member of such corporation is personally liable for such proportion of all its debts and liabilities, incurred during his membership, as the number of shares subscribed by him bears to the whole number of subscriber shares; but no past member is liable for such contribution if more than one year had elapsed since he ceased to be a member before suit is commenced, nor for any debt or liability contracted after the time to which he ceased to be a member, nor unless it appears to the Court that the corporation is unable to satisfy such debts and liabilities; nor must any contribution be required for any member or past member exceeding the amount unpaid on the shares in respect of which he is liable.

(Consolidation and transfer of corporation business and property.)

647. Any two or more such corporations may unite and become incorporated in one body, with or without any dissolution or division of the funds of such corporation, or either of them; or any such corporation may transfer its engagements, funds, and property to any other such corporation, upon such terms as may be agreed upon by two thirds of the members of each of such bodies present at general meetings of the members, convened for the purpose by notice stating the object of the meeting, sent through the postoffice to every member, and by general notice, appearing daily at least one week, or weekly at least two weeks, in some newspaper published at the place of the principal business of the corporation; but no such transfer can prejudice any right of any creditor of either corporation.

(Married women and minors.)

648. Married women and minors may be admitted as members and may take and hold shares in such corporations, and may execute all necessary instruments and give all necessary acquittances, and sell and transfer their shares, in like manner as other members.

Mining Partnerships.

(When a mining partnership exists.)

2511. A mining partnership exists when two or more persons who own or acquire a mining claim for the purpose of working it and extracting the mineral therefrom actually engage in working the same.

(Express agreement not necessary to constitute.)

2512. An express agreement to become partners or to share the profits and losses of mining is not necessary to the formation or existence of a mining partnership. The relation arises from the ownership of shares or interests in the mine and working the same for the purpose of extracting the minerals therefrom.

(Profits and losses, how shared.)

2513. A member of a mining partnership shares in the profits and losses thereof in the proportion which the interest or share he owns in the mine bears to the whole partnership capital or whole number of shares.

(Lien of partners.)

2514. Each member of a mining partnership has a lien on the partnership property for the debts due the creditors thereof, and for money advanced by him for its use. This lien exists notwithstanding there is an agreement among the partners that it must not.

(Mine partnership property.)

2515. The mining ground owned and worked by partners in mining, whether purchased with partnership funds or not, is partnership property.

(Partnership not dissolved by sale of interest.)

2516. One of the partners in a mining partnership may convey his interest in the mine and business without dissolving the partnership. The purchaser, from the date of his purchase, becomes a member of the partnership.

(Purchaser takes, subject to liens, unless, etc.)

2517. A purchaser of an interest in the mining ground of a mining partnership takes it subject to the liens existing in favor of the partners for debts due all creditors thereof, or advances made for the benefit of the partnership, unless he purchased in good faith, for a valuable consideration, without notice of such lien.

(Takes with notice of lien, when.)

2518. A purchaser of the interest of a partner in a mine when the partnership is engaged in working it, takes with notice of all liens resulting from the relation of the partners to each other and to the creditors of the partnership.

(Contract in writing, when binding.)

2519. No member of a mining partnership or other agent or manager thereof can, by a contract in writing, bind the partnership, except by express authority derived from the members thereof.

(Owners of majority of shares govern.)

2520. The decision of the members owning a majority of the shares or interests in a mining partnership binds it in the conduct of its business.

Fuel at the Washoe Mines.

As wood in the timber ranges of the Sierra Nevada Mountains is daily becoming more difficult of access, and as the supply is rapidly growing "heavily less," it has even now become a question of no little interest to know how the growing deficiency in fuel for milling, mining and other purposes is to be supplied. We can look for relief in no other direction than to the coal regions of the Rocky Mountains. The slopes of the Sierras will soon be denuded of everything that can be worked up into cordwood, and as we cannot wait for a new growth of timber we must look in some other direction for our fuel. Hitherto there has been some difficulty about getting full and regular supplies of coal from the Rocky Mountain coal regions and our mine and mill owners have for this reason been somewhat backward about adopting it and depending on it for daily use. Now, however, we learn that the Virginia and Truckee Railroad Company have assurances from the Rocky Mountain Coal Company that they will be able to give a supply of coal to this portion of the State in quantity sufficient to make up any deficiency in our full supply that may arise from a shortness of wood. There will soon be an immense demand for coal in all this region, and year by year this demand must increase if our mines hold out as they now promise to do. The season during which wood can be got down off the mountains is short, and every year the woodcutters are climbing higher and higher up their slopes, greatly increasing the distance and difficulty of transportation. It is now proposed to land coal at the depot in this city at \$18 per ton of 2,240 pounds. This may do for a short time, but we must soon have it cheaper. The cheaper it is furnished the more we will take of it. The majority of our mill and mine owners are already preparing to burn coal, and once it is made sufficiently cheap along the line of the Virginia and Truckee Railroad, only that quantity of wood required to be used with the coal, to produce the heat effect in steam-making, will be called for. For this purpose more or less wood

will always be used, provided it can be obtained at a reasonable price, therefore the owners of wood-ranches need not be alarmed at the introduction of coal in our mines.—*Virginia Enterprise*.

THE IRON MINE SOLD.—It is reported that the iron mine near Mohawk Valley, Plumas county, has been sold to a party of heavy capitalists, and it is thought that some very extensive operations will be commenced in the spring toward the opening and developing this vast deposit of iron ore. The company talk seriously of constructing a narrow-gauge road to Reno, or some point of connection with the Central Pacific. That highly renowned scientific explorer, Clarence King pronounced this mine the finest body of ore west of the Rocky Mountains. Should the report be true, we think the company have the most valuable piece of property in the northern part of the State. The timber interests, in connection with the road and the mine, would certainly place the property on a paying basis second to none west of the California line.—*Plumas National*.

A SAFETY SHOE FOR RAILWAY CARS is an invention which has recently been attracting considerable attention at Philadelphia, and which is figured in the last number of the *Journal of the Franklin Institute*. The device consists of strong wrought iron runners affixed lengthwise of the car and upon both sides, so arranged that in case of the breaking of a wheel the weight of the car comes upon the runner, by which it may move along with comparative ease upon the outer ends of the tie. It is said that there is a probability that the device will soon receive a practical test.

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[Special Mention.]
Let Them Come!

We are informed by letter from Capt. J. M. Keeler, of New York, who exhibited the *Eureka Pump* last season in our city and at the State Fair, that a Stock Company, to be known as the Keeler, Hine & Thomas Co., has been organized in New York to manufacture and sell this Pump on our Coast, and that it will hereafter be called after the inventor, as the Government have adopted it for fire and bilge purposes on vessels, calling it the Sluothur Pump.

This Company propose to open a house in San Francisco some time in March, and will also sell Pipe, Hoses, and Brass Fixtures, Ornamental Castings and wrought work in brass and iron; Stable Fixtures, Weather Vanes, Crestings and Rustic Work, Statuary, Figures, Vases and Fountains for Ornamental Grounds; and in fact all the most valuable improvements pertaining to water works, public and private grounds and parks, and claiming the best Pump for hand and windmill power. They also set forth that they will exhibit the best windmill in the world; and they claim to have the best and most powerful Pump for deep mining and for forcing water through towns and cities for ordinary and hydrant purposes, and to serve the immense requirements of irrigation on our Coast.

Capt. Keeler is an old Californian, and seems to understand the needs of the Pacific Coast. He is the Vice-President of this Company, and will come out to take the management of the business.

The main propositions of this Company concern our most vital interests, and we hope they can be fully demonstrated, consequently we bespeak them a hearty welcome and abundant success, and we repeat, let them come.

"PAIN-KILLER."—There can be no necessity, at this late day, for the *Press* to speak in commendatory terms of this remarkable medicine, in order to promote its sale; for it is a medicine that is known and appreciated the wide world through. Whenever we speak of the Pain-Killer, as in the present instance, we do so in behalf of the afflicted, rather than with the view of advancing the interest of its proprietors. For various diseases, such as rheumatism, cholera, cholera-morbus, burns, sprains, bruises, and so on, to the end of the catalogue, we are convinced that there is no remedy before the people equal to Davis' Vegetable "Pain-Killer," and we know that thousands upon thousands entertain the same belief. Certainly, we cannot refer to the history of any medicine which equals that of the Pain-Killer. It was introduced in 1840, and from that time to this its sale, both at home and abroad, has constantly and rapidly increased, and we rejoice at the high reputation it has achieved, because this reputation shows that it has been the means of relieving a vast amount of human suffering. We hope the present proprietors of Davis' Vegetable "Pain-Killer" will long live to enjoy the popularity they have so fairly won.

A CARD.—Mr. Editor.—I beg to inform the public generally, that one Charles O. Milton, who has been exhibiting a fire escape at Woodward's Gardens and other public places, of late, claims that this invention is his. In justice to the right inventor of this device, I beg to inform you that the invention belongs to me in Washington, D. C., in the presence of many and distinguished gentlemen connected with the Patent Office and Public Works Department. Yours, etc., ROBERTSON RUTTER, Sole Inventor. San Francisco, Feb. 25, 1873.

No LIFE INSURANCE COMPANY has a better record or more permanently popular reputation than the CONNECTICUT MUTUAL LIFE INSURANCE CO., J. E. Roberts, 315 California Street, San Francisco, is general agent for this Coast. Send to him for circulars and information of this reliable, first-class company.

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Every description of Engineers' and Machinists' supplies, for sale by

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NOVEL AND PROLIFIC VARIETY Branching Joint Pop Corn.



[From Pacific Rural Press.]
For CORN.—In our illustration we present a variety that claims the merit of being simply perfect pop-corn; it was raised by Joseph Dimmock, of Windsor, Sonoma County, last year. It is exceedingly prolific, and many stalks produced ears that were above by our engraving. We have tried the popping quality of this corn, and know it to be superior. It matures early.
We have before spoken of the remarkable production, and can vouch for its growth in California, as stated above; but for its success elsewhere we quote the following from Mr. J. J. Johnson, who first propagated it:
"The most productive variety known, producing from EIGHT to TEN EARS ON EACH STALK. Equal to a yield of from 150 to 200 bushels per acre. Although it is strictly speaking, a variety of parching corn, it is adapted to all purposes of common field corn for stock and poultry feeding, etc. It weighs, when shelled, stricken measure, 58 1/2 pounds per bushel. It should be planted in drills three feet apart, putting one kernel to every foot."

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GOOD WORDS

—FOR THE—

PAIN-KILLER.

We can confidently recommend the Pain-Killer.—[Toronto Baptist.]

It is the most effectual remedy we know of for Aches, Pains, flesh wounds, &c.—[St. Johns News, P. Q.]

We advise that every family should have an effective and speedy Pain-Killer.—[Amherst N. S. Gazette.]

Our own experience is that a bottle of Pain-Killer is the best Physician a traveller can have.—[Hamilton Spectator.]

For both internal and external application have found it of great value.—[Chris. Era.]

A medicine no family should be without.—[Montreal Transcript.]

Could hardly keep house without it.—[Ed. Voice.]

Should be kept in every house, in readiness for sudden attacks of sickness.—[Chris. Press.]

No article ever obtained such unbounded popularity.—[Salem Observer.]

One of the most reliable specifics of the age.—[Old North State.]

Its power is wonderful and unequalled in relieving the most severe pain.—[Burlington Sentinel.]

An indispensable article in the medicine chest.—[N. Y. Examiner.]

It will recommend itself to all who use it.—[Georgia Enterprise.]

Is extensively used and sought after as a really useful medicine.—[Journal, St. John, N. B.]

No medicine has acquired such a reputation; it has real merit.—[Newport Daily News.]

One of the most useful medicines; have used it and dispensed it for the past twenty years.—[Rev. Wm. Ward, Assam.]

The most valuable medicine now in use.—[Teun. Organ.]

It is really a valuable medicine, and used by many physicians.—[Boston Traveler.]

We always keep it where we can put our hands on it in the dark, if need be.—[Rev. C. Hubbard, Burmah.]

One of the few articles that are just what they pretend to be.—[Brunswick Telegraph.]

In my mountain travels no medicine is as of universal application as Pain-Killer.—[Rev. M. H. Bixby, Burmah.]

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Call or write. Terms reasonable. Medicines supplied. Office and Residence, N. E. Cor. Union Square, 222 Stockton street, near Post, San Francisco. fe22tf.

Scorpion Silver Mining Company.—Loca-

tion of Works, Virginia City, Storey County, Nevada. Principal place of business, San Francisco, California. Notice is hereby given, that at a meeting of the Directors of said Company, held on the 5th day of February, 1873, an assessment of fifty cents per share was levied upon the capital stock of the corporation, payable immediately in United States gold and silver coin, to the Secretary, at No. 523 Kearny street, Room 22, San Francisco, California. Any stock upon which this assessment shall remain unpaid on the 12th day of March, 1873, will be delinquent, and advertised for sale at public auction, and unless payment is made before, will be sold on Monday, the 26th day of March, 1873, to pay the delinquent assessment, together with costs of advertising and expenses of sale. By order of the Directors. WM. H. MARTIN Secretary, Office, 523 Kearny street, Room 22, San Francisco, California.

Mining and Other Companies.

Owing to the time necessary to mail the present large edition of the M. & S. Press, we are obliged to go to press on Thursday evening—which is the very latest hour we can receive advertisements.

Admiral Nelson Tunnel and Mining Com-

pany.—Location of works, Emma Hill, Little Cottonwood Mining District, Salt Lake County, Utah Territory. Principal place of business, in the city of San Francisco, California. Notice is hereby given, that at a meeting of the Board of Directors of said Company, held on the 27th day of January, A. D. 1873, an assessment of ten cents per share was levied upon the capital stock of the corporation, payable immediately in United States gold and silver coin, to the Secretary of the Company, at his office, No. 539 California street, San Francisco, Cal., by stock upon which said assessment shall remain unpaid on Saturday, the 8th day of March, A. D. 1873, will be delinquent, and will be duly advertised for sale at public auction, and unless payment is made before, will be sold on Monday, the 26th day of March, A. D. 1873, to pay the delinquent assessment, together with costs of advertising and expenses of sale. By order of the Board of Directors. R. H. SINTON, Secretary, Office, No. 539 California Street, San Francisco.

Eagle Quicksilver Mining Company.—Loca-

tion of works, Santa Barbara County, California. Notice is hereby given, that at a meeting of the Board of Trustees of said Company, held on the 18th day of January, 1873, an assessment of fifty dollars (\$50) per share was levied upon the capital stock of said Company, payable immediately in gold coin of the United States, to the Secretary at his office, Room 5 and 6, No. 302 Montgomery street, San Francisco, California. Any share upon which said assessment shall remain unpaid on Wednesday, the 13th day of March, 1873, shall be deemed delinquent, and will be duly advertised on Saturday, March 23d, 1873, for sale at public auction, and unless payment shall be made before, will be sold on Monday, the 26th day of March, 1873, to pay the delinquent assessment, together with costs of advertising and expenses of sale. By order of the Board of Trustees. W. H. WATSON, Secretary, Office, Room 5 and 6, No. 302 Montgomery street, San Francisco, Cal. fe25

Dauphin Mining Company.—Location of

works, Wyandott District, Butte County, California. Notice.—There are delinquent upon the following described stock, on account of assessment, No. 1, levied on the eighth (8th) day of January, 1873, the several amounts set opposite the names of the respective shareholders as follows:

Names.	No. Certificate.	No. Shares.	Amount.
Balcom, C. F. Trustee.....	1	100	\$40 00
Balcom, O. F. Trustee.....	2	100	40 00
Balcom, C. F. Trustee.....	7	100	40 00
Balcom, O. F. Trustee.....	8	100	40 00
Balcom, C. F. Trustee.....	9	100	40 00
Balcom, O. F. Trustee.....	10	100	40 00
Balcom, C. F. Trustee.....	11	50	20 00
Balcom, O. F. Trustee.....	12	40	16 00
Balcom, C. F. Trustee.....	13	100	40 00
Balcom, O. F. Trustee.....	14	100	40 00
Balcom, C. F. Trustee.....	15	50	20 00
Balcom, O. F. Trustee.....	16	25	10 00
Balcom, C. F. Trustee.....	17	25	10 00
Balcom, O. F. Trustee.....	18	100	40 00
Balcom, C. F. Trustee.....	19	100	40 00
Balcom, O. F. Trustee.....	20	100	40 00
Balcom, C. F. Trustee.....	21	100	40 00
Singer, R. C. Trustee.....	22	100	40 00
Kreider, S. D. Trustee.....	23	500	200 00
Kreider, S. D. Trustee.....	24	400	160 00
Kreider, S. D. Trustee.....	25	1000	400 00
Balcom, O. F. Trustee.....	26	1000	500 00
Balcom, C. F. Trustee.....	27	1250	500 00
Balcom, O. F. Trustee.....	28	1000	400 00
Balcom, C. F. Trustee.....	29	1000	400 00
Balcom, O. F. Trustee.....	30	1000	400 00
Singer, R. C. Trustee.....	31	500	200 00
Kreider, S. D. Trustee.....	32	500	200 00
Kreider, S. D. Trustee.....	33	400	160 00
Kreider, S. D. Trustee.....	34	1000	400 00
Balcom, O. F. Trustee.....	35	1000	500 00
Balcom, C. F. Trustee.....	36	1250	500 00
Balcom, O. F. Trustee.....	37	1000	400 00
Balcom, C. F. Trustee.....	38	1000	400 00
Balcom, O. F. Trustee.....	39	1000	400 00
Balcom, C. F. Trustee.....	40	1000	400 00
Balcom, O. F. Trustee.....	41	1000	400 00
Balcom, C. F. Trustee.....	42	1000	400 00
Balcom, O. F. Trustee.....	43	1000	400 00
Balcom, C. F. Trustee.....	44	1000	400 00
Balcom, O. F. Trustee.....	45	1000	400 00
Balcom, C. F. Trustee.....	46	1000	400 00
Balcom, O. F. Trustee.....	47	1000	400 00
Balcom, C. F. Trustee.....	48	1000	400 00
Balcom, O. F. Trustee.....	49	1000	400 00
Balcom, C. F. Trustee.....	50	1000	400 00
Balcom, O. F. Trustee.....	51	1000	400 00
Balcom, C. F. Trustee.....	52	1000	400 00
Balcom, O. F. Trustee.....	53	1000	400 00
Balcom, C. F. Trustee.....	54	1000	400 00
Balcom, O. F. Trustee.....	55	1000	400 00
Balcom, C. F. Trustee.....	56	1000	400 00
Balcom, O. F. Trustee.....	57	1000	400 00
Balcom, C. F. Trustee.....	58	1000	400 00
Balcom, O. F. Trustee.....	59	1000	400 00
Balcom, C. F. Trustee.....	60	1000	400 00
Balcom, O. F. Trustee.....	61	1000	400 00
Balcom, C. F. Trustee.....	62	1000	400 00
Balcom, O. F. Trustee.....	63	1000	400 00
Balcom, C. F. Trustee.....	64	1000	400 00
Balcom, O. F. Trustee.....	65	1000	400 00
Balcom, C. F. Trustee.....	66	1000	400 00
Balcom, O. F. Trustee.....	67	1000	400 00
Balcom, C. F. Trustee.....	68	1000	400 00
Balcom, O. F. Trustee.....	69	1000	400 00
Balcom, C. F. Trustee.....	70	1000	400 00
Balcom, O. F. Trustee.....	71	1000	400 00
Balcom, C. F. Trustee.....	72	1000	400 00
Balcom, O. F. Trustee.....	73	1000	400 00
Balcom, C. F. Trustee.....	74	1000	400 00
Balcom, O. F. Trustee.....	75	1000	400 00
Balcom, C. F. Trustee.....	76	1000	400 00
Balcom, O. F. Trustee.....	77	1000	400 00
Balcom, C. F. Trustee.....	78	1000	400 00
Balcom, O. F. Trustee.....	79	1000	400 00
Balcom, C. F. Trustee.....	80	1000	400 00
Balcom, O. F. Trustee.....	81	1000	400 00
Balcom, C. F. Trustee.....	82	1000	400 00
Balcom, O. F. Trustee.....	83	1000	400 00
Balcom, C. F. Trustee.....	84	1000	400 00
Balcom, O. F. Trustee.....	85	1000	400 00
Balcom, C. F. Trustee.....	86	1000	400 00
Balcom, O. F. Trustee.....	87	1000	400 00
Balcom, C. F. Trustee.....	88	1000	400 00
Balcom, O. F. Trustee.....	89	1000	400 00
Balcom, C. F. Trustee.....	90	1000	400 00
Balcom, O. F. Trustee.....	91	1000	400 00
Balcom, C. F. Trustee.....	92	1000	400 00
Balcom, O. F. Trustee.....	93	1000	400 00
Balcom, C. F. Trustee.....	94	1000	400 00
Balcom, O. F. Trustee.....	95	1000	400 00
Balcom, C. F. Trustee.....	96	1000	400 00
Balcom, O. F. Trustee.....	97	1000	400 00
Balcom, C. F. Trustee.....	98	1000	400 00
Balcom, O. F. Trustee.....	99	1000	400 00
Balcom, C. F. Trustee.....	100	1000	400 00

CHAS. F. BALCOM, Secretary, Office, 426 Montgomery street, San Francisco, California. fe22

Imperatrice Eugenie Gold and Silver Min-

ing Company.—Location of principal place of business, San Francisco, California. Location of works, Blue Mountain, Calaveras County, California. Notice is hereby given, that at a meeting of the Board of Directors, held on the fifteenth day of February, A. D. 1873, an assessment of fifty cents per share was levied upon the capital stock of the corporation, payable immediately in United States gold coin, to the Secretary, at the office of the Company, 712 and 714 Washington street, San Francisco, California. Any stock upon which said assessment shall remain unpaid on Saturday, March 23d, 1873, will be delinquent, and advertised for sale at public auction, and unless payment is made before, will be sold on Monday, the 26th day of March, 1873, to pay the delinquent assessment, together with costs of advertising and expenses of sale. By order of Board of Directors. GUSTAVE BERSON, Secretary, Office, 712 and 714 Washington street, San Francisco, California. fe22

Lady Franklin Gold and Silver Mining

Company.—Principal place of business, city and county of San Francisco, State of California. Location of works, Silver Mountain Mining District, Alpine county, State of California. Notice is hereby given, that at a meeting of the Board of Directors, held on the 18th day of February, 1873, an assessment of fifty (50) cents per share was levied upon the capital stock of the corporation, payable immediately in United States gold coin, to the Secretary, at his office, 507 Montgomery street, San Francisco, California. Any stock upon which this assessment shall remain unpaid on the thirty-first day of March, 1873, will be delinquent, and advertised for sale at public auction, and unless payment is made before, will be sold on Monday, the 26th day of April, 1873, to pay the delinquent assessment, together with costs of advertising and expenses of sale. J. S. LUTY, Secretary, Office, 507 Montgomery street, San Francisco, California. fe22

Lemon Mill and Mining Company.—Prin-

cipal place of business, City and County of San Francisco, State of California. Location of works, Eureka Mining District, Lander County, State of Nevada. Notice is hereby given, that at a meeting of the Board of Directors, held on the 18th day of February, 1873, an assessment of one dollar (\$1) per share was levied upon the capital stock of the Corporation, payable immediately in United States gold coin, to the Secretary, at his office, No. 608 Merchant street, San Francisco, California. Any stock upon which this assessment shall remain unpaid on the 18th day of March, 1873, will be delinquent, and advertised for sale at public auction, and unless payment is made before, will be sold on Monday, the 26th day of April, 1873, to pay the delinquent assessment, together with costs of advertising and expenses of sale. T. M. LILKEN, Secretary, Office, 608 Merchant street, San Francisco, California. feb 15

Mansfield Gold Mining Company.—Prin-

cipal place of business, San Francisco, California. Location of works, Kelsey Mining District, El Dorado County, California. Notice is hereby given, that at a meeting of the Board of Directors, held on the 17th day of February, 1873, an assessment of two and one-half cents, per share was levied upon the capital stock of the corporation, payable immediately in United States gold and silver coin, to the Secretary, at the office of the company, room 14, 331 Kearny street. Any stock upon which this assessment shall remain unpaid on the 25th day of March, 1873, will be delinquent, and advertised for sale at public auction, and unless payment is made before, will be sold on Monday, the 18th day of April, 1873, to pay delinquent assessment, together with costs of advertising and expenses of sale. W. M. SMALL, Secretary, Office—Room 14, 331 Kearny street. mrl

Meadow Valley East Extension M. Co.—

Location of principal place of business, 419 California street, San Francisco, California. Location of works, Ely District, Lincoln County, Nevada. Notice.—There is delinquent upon the following described stock, on account of assessment (No. 2) levied on the 15th day of January, 1873, the several amounts set opposite the names of the respective shareholders, as follows:

Names.	No. Certificate.	No. Shares.	Amount.
Boyd & Davis, Trustees.....	1	50	\$ 5 00
Boyd & Davis, Trustees.....	2	50	5 00
Boyd & Davis, Trustees.....	3	25	2 50
Bayquer, R.	4	100	3 00
Bayquer, R.	5	100	10 00
Brand, Jno G.	6	307	15 15
Buckley, Jno.	7	224	2 25
Boyd, Theodore C.	8	525	10 00
Billowman, H. J.	9	551	12 50
Benson, Jno.	10	375	10 00
Bonlangier, P.	11	498	2 50
Cops, G. W. Trustee.....	12	539	5 00
Cavallier, J. P. Trustee.....	13	10	1 00
Cartwright, Jno.	14	446	1 00
Chloriotto, Antonio.....	15	617	5 00
Cady, A. M. Trustee.....	16	623	17 1/2
De Solla, J. M.	17	583	50 00
Eyre, E. E. Trustee.....	18	521	2 50
Eyre, E. E. Trustee.....	19	52	2 1/2
Fieid, Wm A.	20	102	10 00
Forbes, Alex. Trustee.....	21	435	21 1/2
Forbes, Alex. Trustee.....	22	442	10 00
Forbes, O. S.	23	549	125 12 50
Glazier & Seligsberg, Trustees.....	24	206	40 00
Glazier & Seligsberg, Trustees.....	25	317	25 2 50
Glazier & Seligsberg, Trustees.....	26	50	5 00
Grimes, N. K. Trustee.....	27	344	50 00
Gould, O. G.	28	332	1 00
Hoffman, Ogden	29	443	500 50 00
Henriques, D. Trustee.....	30	107	25 2 50
Hathorn, H. W.	31	572	25 2 50
Hathorn, H. W.	32	508	75 75 00

Machine Builders.

ESTABLISHED 1851.

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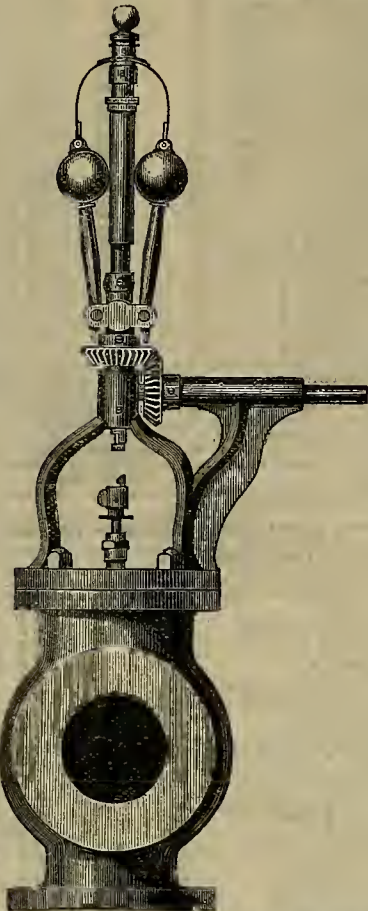
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IRON CASTINGS of all descriptions at short notice. All orders punctually executed in time agreed on. Particular attention paid to making superior Shoes and Dies. Among the special castings of this Foundry are the well known CALLAHAN GRATE BAR, of superior merit for burning screenings—all size Bars. STRATTON'S JACK SCREWS, all sizes. Superior compact and effective Horse Powers, Pumps, Agricultural Castings, Ingot Moulds, Assaying and Refining Retorts and Kettles, and a great variety of other and special castings.

STEIGER & BOLAND Proprietors.

Steiger & Boland are the sole Manufacturers of the Improved Hepburn Roller Pan. The patterns having all the improvements to those Pans are at the Occidental Foundry, enabling the Establishment to deliver all pans and parts thereof with uniformity, finished in the best style, and at the lowest possible price. Pan Castings furnished the trade, with liberal facilities for erection, &c. All persons are cautioned against making, selling or using these Pans, except through the authorized agents and manufacturers, viz., Steiger & Boland, of the Occidental Foundry, S. F.

25725-3m

WM. H. HEPBURN.

This Cut represents the Governor with all the improvements. It is simple in its construction and accurate in the regulation of speed, with a positive active trip valve attached, a preventive against all accidents liable to occur from the parting of the Governor belt or any other cause that would prevent the working of the Governor, and is so arranged that the speed of the Engine can be readily adjusted while in motion, without change of Pulleys.

DESCRIPTION.

The Valve Stem is divided into two parts, viz: the upper and lower Stem; the upper Stem being connected at the top with the sliding Sleeve to which the Spring and Gear is attached; the lower Stem is attached to the Valve by an adjustable screw and stirrup by which the Valve is adjusted by a thumb screw at the upper end. The upper and lower Stems are connected together by a Ketch on the lower Stem, which fits into a turned Groove on the lower end of the upper Stem, and is disconnected by the end of the Ketch coming against the sleeve through which the upper Stem passes, allowing the Valve to drop, which immediately shuts off the Steam. To connect the Stems turn the thumb-wheel half round, so that the Ketch may pass into the recess in the Sleeve. After starting engine, turn the Ketch half round and secure with Spring on front.

RECOMMENDATION.

St. PATRICK MILL, Placer Co., Feb. 10, 1873.

JOSHUA HENDY, ESQ., SAN FRANCISCO.
Dear Sir: We, the undersigned, take pleasure in giving you the following testimonial as to the merits of the Hendy Governor, which we ordered from you about four months ago. Though more than pleased with its workings at first, we deferred writing until we had tested it thoroughly.

Our engine is 12½ hp (carrying 70 lbs. of steam), driving 15 stamps, 12½ lbs. each; 1 Wheeler Pan, 1 Knox Pan, 6 Hendy Concentrators. The discarded Governor was the common "Arm and Ball Governor;" it giving but poor satisfaction, we decided to try the "HENDY," and are pleased to report in its favor for the following reasons:

1st. It saves Fuel. Previous to attaching your Governor we were burning 3½ cords of wood per 24 hours. We now consume but 2½ cords doing the same work.

2d. For safety. The "trip" saved us from an expensive smash up but a few days ago, during the temporary absence of our engineer. The Governor belt ran off the Pulleys. Your little automatic trip worked like a charm, and but one or two revolutions was the result, and no damage. Had we been using any other Governor, the probability is that we would not have had a whole cam in the mill.

3d. It is a PERFECT GOVERNOR. We can turn off the Wheeler Pan and hang up one-third of our stamp, without any perceptible change in speed.

4th. THE ADJUSTMENT for regulating the speed without increasing or reducing the size of our Governor pulley, is admirable, and as easy as setting a clock.

5th. It is simple and yet able to get out of order, or requiring more than ordinary care.

Yours res. truly,

J. S. H. CROSSMAN, Supt.
(Signed by request.) GEO. H. BARNEY, Chief Eng'r.

REFERENCES.

Eureka M. Co., Overman M. Co., Virginia City, Nev.
Camp Lloyd M. Co., Utah S. M. Co., Utah.
Falk & Miner, Eureka; J. M. Brown, Hollister; Gazos Mill, Pescadero, Cal.
Also, Bancroft & Co., Yolo Mills; The Union, Golden Gate, Asta and Fulton Iron Works, of this city.

THE RISDON

Iron and Locomotive Works.

INCORPORATED.....APRIL 30, 1868.
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Manufacturers of Steam Engines, Quartz and Flour Mill Machinery, Steam Boilers (Marine, Locomotive and Stationary), Marine Engines (High and Low Pressure). All kinds of light and heavy Castings at lowest prices. Cams and Tappets, with chilled faces, guaranteed 40 per cent, more durable than ordinary iron.

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JOSEPH MOORE.....Vice-President and Superintendent
LEWIS B. MEAD.....Secretary
24v17-07

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Every Description of Ornamental Work,
Stove and French Range Work, grate and fender work,
small machines of all descriptions, house
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25725-3m

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PRICES MODERATE.
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LIGHT AND HEAVY CASTINGS,

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Miners' Foundry and Machine Works,

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Machinery and Castings of all kinds.

Machinery.

POWER, TANTER & CO.,

MANUFACTURERS OF



WOOD-WORKING MACHINERY.

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PHILADELPHIA.

Woodworth Planers a specialty. 4v25-3m

Notice is hereby given, that the copartnership heretofore existing between A. J. Severance, Charles W. Randall and J. Gus. Burt, under the firm name of "Severance, Holt & Co.," is this day dissolved by mutual consent. A. J. Severance, having purchased all the interest of his late partners, will continue the business of manufacturing and selling Diamond Drills as before, under the style of A. J. Severance & Co.

Dated San Francisco, Nov. 24, 1871.
Office, 315 California street. A. J. SEVERANCE,
CHAS. W. RANDALL,
J. GUS. BURT.

22-v23-1f

FARCIOT & VANDRAKE,

GENERAL MACHINISTS,

No. 13 Fremont Street [Nelson & Doble's Building],

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NOTICE.—Special attention called to our new STRAIGHT PUNCHING PRESS, which we have on hand for use of customers. Capacity, 1800 per hour. All kinds of Dies and Punches made to order. 23v25-3m

THEODORE KALLENBERG,

MACHINIST,

and Maker of Models for Inventors. All kinds of Dies

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Small Gears Cut.

Repairing done on very Reasonable Terms and in the

best manner. No. 32 Fremont street, S. F. 19v23-3m

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ROCK DRILLS

—AND—

Air Compressors.

The Burleigh Rock Drills, which have stood the test of five years' constant use at the Hoosac Tunnel, and which are now in use in nearly every State in the Union, as well as in Europe and South America, are unequalled in efficiency and economy by any other Drilling Machine. They are of various sizes, and equally well adapted to Tunneling, Shafting, Open Cut or Quarrying, and will drill six to ten inches per minute in granite. They are driven by steam above ground. The Burleigh Air Compressor is the best engine yet devised for furnishing the "air motor" for the many purposes to which it is now being used.

They are to be used on the St. Gothard Tunnel, Switzerland; Tunnel 13 miles long. We refer to the following gentlemen and works:

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AGENTS FOR

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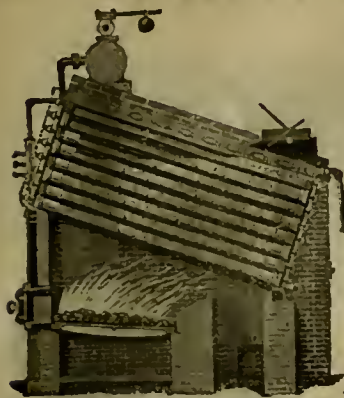
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BOILER MAKERS

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Howard st., between Fremont and Beale, San Francisco.

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IMPROVED AND PERFECTED

— BY —
FIVE YEARS' EXPERIENCE.

And the Sale of Nearly 800 Boilers,

For all manner of use.
Send for Circular, and for further information address
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San Francisco Boiler Works,

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(Late Foreman of the Vulcan Iron Works,) Proprietor.

High and Low Pressure Boilers of all
Descriptions.

SOLE MANUFACTURERS OF THE CELEBRATED
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SHEET IRON WORK of every description done
at the shortest notice.
All kinds of **JOBING** and **REPAIRING** promptly
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OF ALL KINDS,

Built according to Drawings or Specifications, and
SHEET IRON WORK executed at the shortest notice,
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Steam Boiler Manufactory

— OF —

JAMES H. SHANLEY,

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ALL SORTS OF STEAM BOILERS

Made to order and repaired.

Also all kinds of Sheet Iron Work done promptly,
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From the Mining Summary in the Gold Hill News of
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The New Root Boiler

IS A PERFECT SUCCESS.

The saving in the amount of fuel consumed, alone
amounting to 30 per cent. less than the cost of running
the same machinery with the old style of Boilers.
For price list and prompt execution of orders please
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Wagon Maker and Blacksmith,

131 Beale St., between Mission and Howard,

SAN FRANCISCO.

Wagons, Trucks and Carts of every description man-
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all kinds promptly attended to and all work guaranteed
to give satisfaction. 4v26-3m

BUY BARBER'S BIT BRAOE.

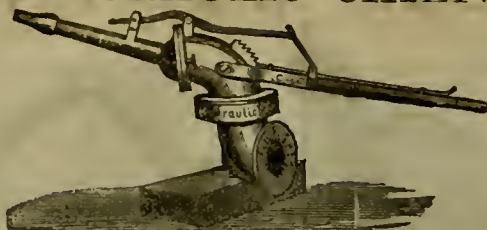
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KNUCKLE
JOINT
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NOZZLE**

IS THE
Cheapest and Best
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in use.

The only reliable party in the Hydraulic business who protects his patrons.
9v23-11 Address V. M. FISHER, Nevada, Cal.

HYDRAULIC MINERS, TAKE NOTICE—I hereby caution Miners and Manufacturers against making, buy-
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J. Craig and Richard Hoskin, as the same is an infringement upon the invention of the machine known as FISH-
ER'S HYDRAULIC CHIEF, secured by Letters Patent, No. 110,222, dated Dec. 20, 1870. All parties participating
in such infringements will be rigorously prosecuted. Nevada, Jan. 13th. F. H. FISHER.

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MACHINES
Manufactured
TO ORDER,
to throw from
One
to an
eight-inch
STREAM.

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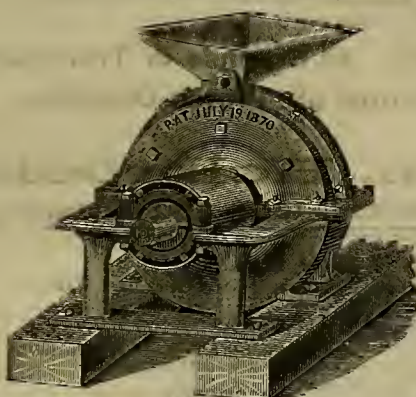
MINING STEAM PUMPS.

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THE LIGHTNING MILL.



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LIGHTNING MILL

For Pulverizing Quartz,

"Charleston Rock," and all Native Phosphates,
Flint, Feldspar, Iron Ore, Manganese, Anthracite,
Carbon, Corundum, Old Crucibles, Barytes, Brit-
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Plaster, Anthracite and Bituminous Coals, etc.

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**Patent Bone Mills and
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For Grinding Bones, Rock, Quartz, and all hard
substances; also, Corn, Wheat, Oats, Barley, Coffee,
Spices, etc.

WALKER BROS. & CO., Twenty-third and Wood Streets, Philadelphia, Sole Manufacturers of Stewart's
Celebrated Patent Bone Mills and Crushers, A. W. Straub & Co.'s Patent Revolution French Burr Mill and A.
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FRIEL'S PARAGON VAPOR STOVE.

PATENT APPLIED FOR.

The Great Labor Saver of the Household.
ECONOMY, CONVENIENCE AND SAFETY COMBINED.



JUST THINK OF IT—
No Wood, no Coal, no Coal
Gas, no Stove Pipe, no
Chimney, no Smoke, no
Ashes, no Dirt, no Wood
Boxes, no Coal Scuttles, no
Kindling Wood, but a
Friction Match, and the
Fire in Full Blast in
Half a Minute!
**OVEN HOT IN TWO
MINUTES.**
Steak broiled in seven
minutes! Baked Beans in
thirty minutes! The fire
extinguished in a moment!
And the house unheated!
It has no rival in all
kinds of Cooking and Flat
Iron Heating, and com-
bines Economy, Conve-
nience, Neatness, Safety and
Durability! The Ladies
Welcome it; a little CHILD
can operate it, and

ALL RECOMMEND IT.

Prices from \$6 to \$25, according to size.

Manufactured and sold by

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California File Manuf'g Co.

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Manufacturers of New Files.
Old Files re-cut and warranted equal to new.

**REAPER AND MOWER SECTIONS, BARS
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promptly attended to. 9v19-1y

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Piles that Dr. King's Pile
Remedy fails to cure. It is pre-
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Manufacturers and have constantly on hand

SPORTING,

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OF SUPERIOR QUALITY, FRESH FROM THE
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We have been awarded successively

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We also call attention to our

HERCULES POWDER.

Which combines all the force of other strong explosive
now in use, and the lifting force of the **GRANITIC**
POWDER, thus making it vastly superior to any other
powder now in use.

A circular containing a full description of this Pow-
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16v20-3m

JOHN F. LOHSE, Secretary.

SAN FRANCISCO

SCREW BOLT WORKS,

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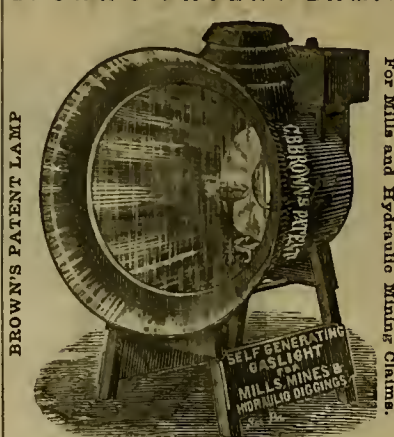
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One of these Lamps, when placed at a distance of 200
feet from the bank, will light up a bank surface 260 feet
in length and 160 feet high, and to a much better ad-
vantage than any other light heretofore tried, and at an
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furnished at short notice.

[Letter of Recommendation.

Me, C. B. BROWN—Sir: Your Patent Lamp for light-
ing hydraulic mines, which you sold to me in December
last, has given entire satisfaction, and far exceeds my
expectations, and I think it the best and cheapest light
ever used to light mining claims by night, and am sat-
isfied that I have saved three hundred dollars by the
use of it in the last mining season over pitch or any
other light of the same brilliancy; and I will also say
that if I could not get another lamp, five hundred dol-
lars would not buy it. Yours,
W. D. APLIN.

Little York, Nov. 5, 1872.

For further particulars, address,
fe22-2t **C. B. BROWN, Placerville, Cal.**

BLACK DIAMOND FILE WORKS.



G. & H. BARNETT,

Manufacturers of Files of every Description

Noe. 39, 41 and 43 Richmond street,
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MILL SAW FILES A SPECIALTY.
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SHEET IRON PIPE.

THE

Risdon Iron and Locomotive Works

Corner Howard and Beale Streets,

Are prepared to make **SHEET IRON AND ASPHALTUM
PIPE**, of any size and for any pressure, and contract to
lay the same where wanted, guaranteeing a perfect
working pipe with the least amount of material.

Standard sizes of railroad Car Wheels, with special
patterns for Mining Cars. These small wheels are made
of the best Car Wheel Iron, properly chilled, and can be
fitted up with the improved axle and box—introduced by
this company, and guaranteed to outlast any other
wheels made in this State.

All kinds of Machinery made and repaired.
24v22-3m **JOSEPH MOORE, Superintendent.**

WARNER & SILSBY

Manufacture all sizes of

Bed and Sofa Springs,

Which they offer to the trade at
reduced prices; also the elab-
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Fastening Bed Spring.**



Any man can make his own Spring Bed with them
by attaching them to the slats of any bedstead.

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OAKEY'S WELLINGTON KNIFE POLISH.

Packets, 3d each: tins, 6d., 1s., 2s., 4d., and 6s. each.

OAKEY'S INDIA RUBBER KNIFE

BOARDS from 1s. 6d. each.

OAKEY'S SILVERSMITH'S SOAP (NON

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OAKEY'S GENUINE EMERY, GRAIN

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OAKEY'S CABINET GLASS PAPER,

BLACK LEAD etc.

OAKEY'S GOODS SOLD EVERYWHERE

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Jos. THORNHILL,

1612 Mason Street, near Green. C. W. WHITE,
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JOS. THORNHILL,

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Particular attention paid to all kinds of **FIRE WORK,**
such as **BOILERS, FURNACES, OVENS,**
GRATES, RANGES, etc.

CAUTION.

Betts's Patent Capsules.

The public are respectfully cautioned that **BETT'S**

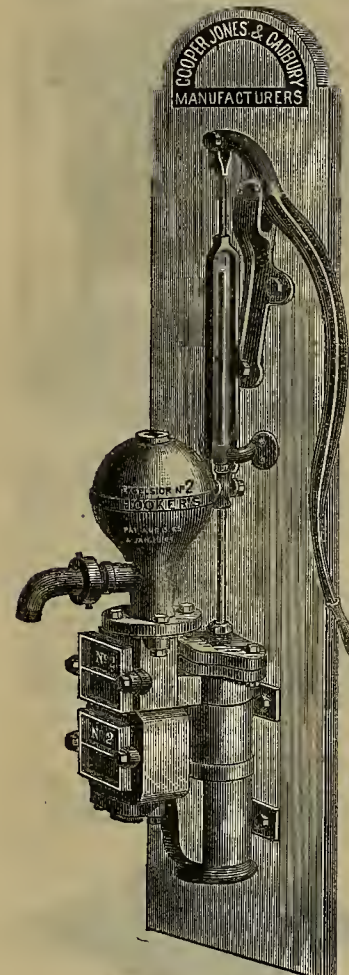
Patent Capsules are being in ringed

BETT'S name to upon every Capsule he makes for the lead-
ing Merchants at home and abroad,

and he is the **ONLY INVENTOR and SOLE MAKER** in
the United Kingdom.

MANUFACTORIES:—1, WHARF-ROAD, OTT-ROAD, LONDON
and **BOURBON, FRANCE.**


EXCELSIOR MINING PUMP.



COOPER, JONES & CAMPBELL
MANUFACTURERS

EXCELSIOR #2
HOOKERS

NO. 2-MOUNTED.



EXCELSIOR
#3
HOOKER

With six years use of this Pump we confidently recommend its

Use for Mining or Prospecting.

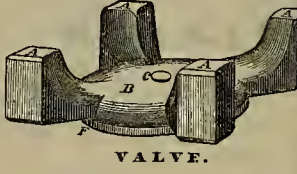
It is the CHEAPEST Pump in the market.

There is NO Trade Pump made of equal strength and power.

Every Pump is tested by hydraulic power to 125 lbs. to the square inch. So every Pump, large or small, is

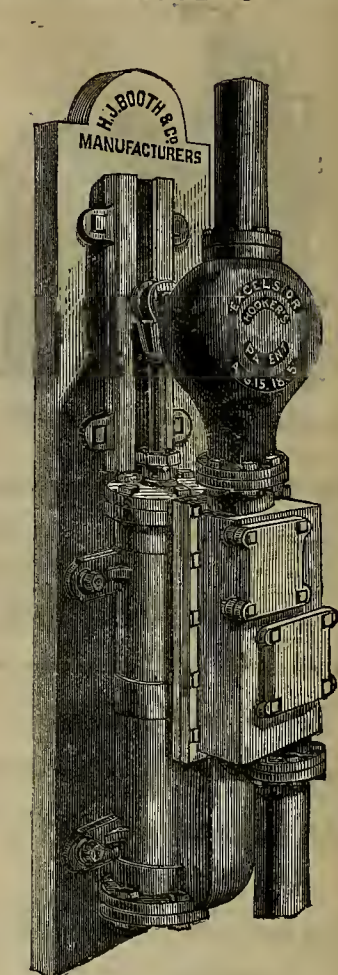
WARRANTED

To Force Water 250 Feet High.



VALVE.

NO. 3-SHIP.



H. BOOTH & CO.
MANUFACTURERS

EXCELSIOR
#1
HOOKER

MINING.

ALL PUMPS WARRANTED. All Expense of Transportation Refunded if the Pumps are Proved Defective.

Send for Circular.

Brittan, Holbrook & Co.,

111 and 113 California street, San Francisco, (and also Sacramento), General Agents.

HALLIDIE'S
Patent Endless Wire Ropeway.
Covered by Numerous U. S. Patents.

IMPORTANT TO
Mining Companies, Civil Engineers, Contractors, Etc.

The system of transporting material, such as Ores, from the mine to the mill, Earths for embankments, Rock from quarries, etc., by means of steel wire rope, has been well tested and found more economical, advantageous and reliable than any other method of transportation; and to the annexed certificates in connection therewith I beg to call the attention of those interested:

EUREKA, Nevada, July 10, 1872.
T. M. MARTIN - My dear sir: On your leaving for San Francisco, it gives me great pleasure to hand you my written acceptance of the HALLIDIE TRAMWAY put up by you upon our mine in Freshburg.

It is a perfect success, discharging ten tons of ore per hour with two men's labor. It is perfectly simple in construction, and, as far as I can judge, there is nothing about it to ever get out of order - nothing to wear out. While ours requires but about two thousand five hundred feet of wire rope, I can see no reason why the line could not be extended almost indefinitely with equally happy results. Again, the carrying capacity might be doubled or quadrupled if desired. After several weeks trial upon our mine, the unanimous verdict of all who have seen it is a complete, unquestioned success. If this can be of any service to you, use it in any way you think proper. Very respectfully, O. C. GOODWIN.

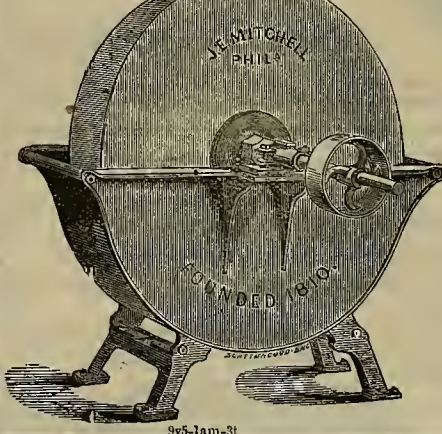
EMMA HILL CONSOLIDATED MINING CO.,
Little Cottonwood, Utah.
Superintendent's Office, Sept. 23, 1872.
T. M. MARTIN, Esq. - Sir: The Ropeway constructed by you (HALLIDIE'S PATENT) for the Emma Hill Consolidated Mining Company, has been built in a most substantial and workmanlike manner, and is at this time in splendid working condition. I most cheerfully accept the work for the Company, and recommend it to others, weighing a sure and speedy transit for ores over places impracticable for wagon roads, etc. Respectfully,
J. W. COLBATH, Superintendent.

"The Vallejo works smoothly with the elevated wire tramway, which carries its load of ore as lightly and easily as if there was no winter or snow in the world."
"Whatever the objections to wire tramways may be on account of their cost, I have seen nothing yet that even approaches them in the facilities they afford for moving ore at all seasons of the year." - Correspondent Utah Mining Journal, Alta, Jan. 8, 1873.

The Vallejo Ropeway.
The Vallejo Tunnel Company's Tramway in Little Cottonwood, built on the HALLIDIE PATENTED PLAN, is a complete success. It is between 2,300 and 2,400 feet in length, and is supported by thirteen stations. The fall in this distance is about 600 feet, and the wire rope, which is three-fourths of an inch in diameter, will safely and easily deliver one hundred tons in six hours. The machinery is automatic, loading and unloading the trucks or chutes. About one ton and a half can be sent down at one time. The stations are about two hundred feet apart, and the entire apparatus is strong and safe. As the wire rope is elevated about forty feet above the surface of the hill, the Tramway can be worked all winter long, without the slightest trouble. - Utah Mining Journal, Salt Lake, Sept. 23, 1872.
Mining Companies and others desiring to negotiate for the erection of this system of Ropeway, can communicate with me personally, or through Postoffice Box 964.

A. S. HALLIDIE, Patentee,
112 and 114 California Street, SAN FRANCISCO.
WIRE ROPE
For hoisting from mines, transmitting power, ship rigging, etc., of all kinds and sizes, on hand and made to order.
Wire of all kinds and descriptions, furnished at lowest rates.
A. S. HALLIDIE, 112 and 114 California St.

GRINDSTONES
From Newcastle, Wickersley, Nova Scotia and Ohio,
OF ALL SIZES AND GRITS.



Especial attention being paid to the selection of suitable grits for grinding

LOCOMOTIVE WORK.

Machinists' Grindstones

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SAN FRANCISCO, SATURDAY, MARCH 8, 1873.

VOLUME XXVI.
Number 10.

Economy of Fuel—Using Steam Expansively.

Much has been said and written on using steam expansively, and opinions vary greatly as to whether it is economical or not to do so. We saw this week at the establishment of the Kimball carriage manufacturing company, a practical solution, in dollars and cents, of this question. The engine used to drive the machinery has a 12-inch cylinder with 24-inch stroke. It has been running since it was erected, without any cut-off, and required in addition to the sawdust, shavings, and waste wood of the factory, \$30 worth of coal per week for fuel. On the first of January, without making any other change in the engine, a common lap-valve cut-off was put on, since which time the coal bill of \$30 per week has been entirely dispensed with. Now, nothing but saw-dust and shavings are used, with a little tan bark to keep the saw-dust from flying, and even the waste pieces are saved and used for domestic purposes. The fireman is not allowed to feed with these pieces. The cut-off is adjustable at pleasure but is generally set to cut off at about a quarter of the stroke. The average pressure of steam carried is 80 pounds, about five pounds higher than was carried previously.

This example is a good demonstration of the economy of using steam expansively and is a practical illustration of a question which has been written about many years. Some judgment of course, has to be used in putting on a cut-off and in operating it. Many people have tried using them, and being unsuccessful, have condemned them. The engineer says that the wear of the cylinder and packing rings in this engine is very different from what it was before. The cylinder has acquired a perfectly glossy surface since the steam has been used expansively, while before it had a granulated appearance. The engine runs much easier and to appearance will do as much work when cut off at one-third of the stroke as it does when running full stroke; of course, in the latter instance, using three times the amount of steam. The expense of putting on the cut-off was about \$250, and as the saving is reckoned at \$30 per week, it has paid for itself in two months. Captain Tyler, who has charge of the machinery at the factory, expresses himself well pleased with the way the engine runs and the economical result, as of course do the proprietors.

EXPECTED LABOR STRIKES.—A dispatch dated New York March 4th makes the following statement: "The Tribune is authority for the following statement that another series of labor strikes, similar to those of last year, are shortly to be made. The battle will be renewed late in April or early in May. Trade organizations are now making extraordinary efforts to gain recruits, as so to move with a solid front when the signal for revolt is given. Employers, however, are prepared, and have evaded large contracts. They will co-operate in making a general defense. Trade unions are now much excited over the coming struggle. The Tribune deprecates the renewal of last year's strikes, and points to the failures and loss to both capital and labor interests, and to the whole community, as reason why they should not recur."

THE WELSH STRIKE.—The iron workers of Merthyr-Tydvil have signified their willingness to resume work at the old rates of wages until the end of March, if an advance of five per cent, is guaranteed from April 1st. This action may end the long strike.

The Pulverizing Barrel.

[Written for MINING AND SCIENTIFIC PRESS by A. Blatchly.]

The revolving iron barrel was first used in this country for cleaning sand from small iron castings and for polishing chains. It was made of different sizes, from two feet in diameter and two feet long, to three feet and a half in diameter and six feet long. The heads were usually of cast iron of sufficient thickness on their peripheries to receive bolts for securing the staves, which were made of cast or wrought iron. Cast iron staves had flanges on the outside to strengthen them when of large size. They were bolted on the heads in such a manner as to leave a small space between them for the escape of the sand as fast as it became detached from the castings, which prevented their sharp corners from being worn away by the sand.

When the barrel was used to polish chains the staves were placed close together so as to retain the sand or emery employed in polishing from escaping from the barrel. In this manner the polishing was rapidly effected, and

out, a new set could be put in place in a short time and the vessel would be as good as new.

These vessels were charged with from six to twelve hundred pounds of iron balls and one thousand pounds of ore, but the feed and discharge of ore was continuous. After the ore was ground it was bolted and that which was not fine enough was returned into the barrel and re-ground.

These barrels were four feet in length and in diameter, and would reduce from six to ten tons per day, the ore being previously reduced in a jaw crusher. The wear of iron in the barrels and on the balls per ton of ore reduced was about the same as in a stamp mill.

In the next will be a description and cut of Paul's Barrel, and a consideration of the principles involved in its operation.

Steven's Oxy-Hydrogen Furnace.

An ore smelting furnace of Levi Steven's patent has been erected at the corner of Main and Harrison streets in this city, and was tried this week. We gave a complete description of this furnace, with a view of it in the MINING AND SCIENTIFIC PRESS of December 7th, 1872, so it is not necessary to go into particulars again. It is intended to economize fuel, and

is running by means of an opening in front, and it can be run night and day for some time without cleaning out. The fuel being ejected into the furnace in a liquid or gaseous form there is very little residue, and what does form, remains on a shelf in front of the burners, from where it can easily be removed. For localities where fuel is scarce and high, this furnace will be extremely useful. Several of them will be put up in different parts of the coast before long, and we will endeavor to obtain the details of their working. This furnace will be especially applicable in the Inyo county mines, for instance, where there is an abundance of asphaltum, and where coal is scarce. Mr. Stevens will no doubt, when his furnace is fully completed, give a more extended trial of its properties, the particulars of which we will lay before our readers.

"HILLS LOOK GREEN AFAR OFF."—It is reported in Salt Lake City that parties there have had an agent out on a prospecting tour in French Guiana, who has returned corroborating accounts of the fabulous richness of the gold mines there. It is said a vessel has been purchased and a grand move is to be made in that direction soon. The rocks of British Guiana, which is the western portion of the territory, are granite porphyry and sandstone. Traces of iron have been found there, but none of the precious metals. French Guiana has the same general characteristics with a fertile soil and salubrious climate. The mountain chains run from east to west, and are almost wholly granite, and in the center of these calmly rise from 12,000 to 15,000 feet above sea-level. There are 20 rivers in the territory, and the gold may have been found there, if it has been found at all. There are plenty of good mines in our own State, which can be worked with profit, without miners getting up an "excitement" to go to such a distant locality for the yellow dust. A company was incorporated in this city this week to mine in the Island of Papua or New Guinea, and that may be the country to which the dispatch referred.

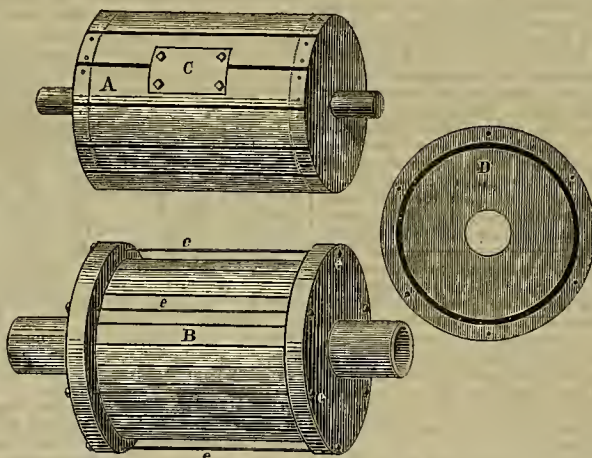
NARROW GAUGE RAILROADS.—The following gentlemen have been elected Directors of the San Joaquin Valley and Vernalis Narrow Gauge Railroad: E. F. Northam, W. B. Boura, G. F. Smith, C. Grattan, R. C. Sargent, A. Leitch, C. M. Blair, H. C. Dallas, R. C. Hyde, E. Jacobs and S. Sweet. It is now highly probable that this road will be completed at an early day and will not only benefit Stockton and Vernalis but all property within 25 or 30 miles of the road.

The engineers are now making estimates of the cost of construction of the Martinez and San Ramon Valley narrow gauge road and will shortly report.

Work on the Marin County narrow gauge road is progressing rapidly. About 300 men are now employed.

ENGLISH MINES.—Forty-six mines in Devon and Cornwall paid out in 123 dividends last year the sum of £275,450. The largest amount paid by any one mine was £48,000 and the smallest £121. This does not make much of a showing for so many mines and so many dividends, as it only foots about \$1,372,000. However, this is only from two counties.

MONTANA ORE SHIPMENTS.—Two hundred tons of silver ore were purchased at Bannock City Montana, on the 15th of February, to be shipped to Swansea for reduction. From \$30 to fifty per ton were paid for various lots,



VIEW OF PULVERIZING BARREL.

when fine emery was employed the polish was very smooth and bright. To charge and discharge, an opening was made in the side of the barrel and closed as shown in the cut of the barrel at c by an iron plate.

One of the first applications, if not the first, of this barrel to pulverizing ores was made in Colorado, when it was called a Bell Pulverizer, from a large number of balls which were charged in the barrel with the ore. B represents this barrel; D is a head showing how the staves are secured into it.

The staves are made of cast iron of the same degree of hardness as shoes and dies for a stamp mill. They are from two to three inches wide and one inch thick, cast with a slight projection on each side at the ends, so as to leave an opening between the staves for the escape of the ore as soon as it is ground sufficiently fine.

In the first barrels constructed, from four to six staves, much thicker than the rest, were set at equal distances from each other, which projected three or four inches further into the barrel than the other staves, making the inside of the barrel with projecting ledges so that as the barrel revolved the ore would be properly jolted. This device though excellent in theory was unfortunate in practice, as the barrel required much more power to drive it, and failed to grind it as fast as when all of the staves were of equal thickness and the inside of the barrel was smooth.

The barrel was held together by rods e, e, passing through the heads and secured by screws and nuts. When the staves were worn

it run with coal tar or asphaltum and superheated steam. The fuel is fed through a pipe and is blown in by the steam. The patentee claims that he utilizes the elements of the water by decomposing it, to aid combustion. At all events he makes a very hot fire, which seems to answer all purposes. The operation is very simple and the heat is under ready control, being reduced or augmented by simply turning on more or less steam; the supply of fuel can of course be controlled.

The furnace in question is not entirely completed, but it ran well enough to demonstrate its applicability for the purpose. The ore is fed from hoppers into a desulphurizer in which a shaft revolves, having upon it paddles, which convey it into the furnace. In this instance the ore was fed in without being desulphurized as the shaft was not ready to be run. The ore used was of low grade argentiferous galena. The fire was started in the furnace at half-past ten, and at half-past twelve the bullion was drawn out—two hours being consumed in thoroughly heating the furnace and reducing the ore. The contents was in a perfectly liquid form, and the ore as it dropped from above seemed to be immediately reduced to a plastic state as soon as it touched the inclined shelf at the back of the furnace. From there it gradually ran down to the bottom where it was completely liquified.

The slag is taken from the furnace while it

Resources of Utah.—Some of Its Principal Mines.—Continued.

The Silver Glimpse Mine,

In American Fork mining district, is owned by Messrs. John Tismna and others, of Salt Lake City. The mine was discovered in the month of October, 1870. It is situated on Silver Glances Hill. The extensive workings have developed an immense vein of ore, encased in well-defined walls, having an average width of six feet. The course of the vein is southeast and northwest, and it is traced and opened for a distance of over 700 feet, thereby establishing the vast extent, intrinsic value and permanency of the property. Several hundred tons of ore were taken out during the developments which are now laying on the dump. The work done embraces four tunnels and two inclines, the combined length of which is over 500 feet.

The character of the ore is chlorides and carbonates with silver glance and native silver. The average assay value is about \$100 to the ton. Some assays of ore from this mine have run as high as \$6,410. As a matter of interest we append a list of assays that have been made with their results:

June 6, 1871.....	\$ 64.10
Oct. 29, 1871.....	4,845.59
Aug. 7, 1871.....	2,276.70
June 24, 1871.....	2,174.71
" " ".....	1,952.80
" " ".....	1,436.60
Nov. 24, 1871.....	
Average of 19 assays.....	440.08

The Amador Mine,

In Little Cottonwood, is west of Emma Hill, and at the head of Superior Gulch. This mine, although not much known, presents a very promising appearance. The vein where exposed in the workings is three feet thick and has all the indications of being a true fissure. The ore is high-grade, free milling, and carrying silver and gold with very little lead. Some eminent Eastern capitalists are investigating the merits of this and some adjacent mines with a view of purchase. The high standing and position of the gentlemen in question is such as to warrant the supposition that there is considerable value attached to the property.

The Vulcan Mine,

Situated about a mile from the city of Stockton, Rush Valley District, in the lower mineral belt, is one of the most promising mines in that neighborhood. The vein has a width of three feet and is distinctly traceable through all present developments. The ore is of very easy reduction, carrying a high percentage of lead, and is found to be a splendid flux in combination with the high-grade ores of Dry Cañon. The owners are actively pushing work upon the property. If present appearances are borne out in future developments, this mine will rank among the prominent mines of the Territory. The character of ore, Carbonate and Galena, assaying on an average, \$50 in silver and 40 per cent. in lead per ton.

The Chicago Mine of Tinic

Is situated about three-quarters of a mile from Silver City, Tintic Mining District. It is on the line of the great mineral belt running through the District. The lode is a well-defined fissure vein in a granite formation. The surface indications are exceedingly favorable, equalling many others in the District, and rich and regular body of ore having been developed. The work consists of a shaft 106 feet deep. About 100 feet southward from the shaft is a cut 26 feet deep, and a shaft has been sunk from it on the vein to a depth of 30 feet. From the bottom of the shaft a drift is run southward for 70 feet and northward for 100 feet, both worked on the lode and exhibiting a good body of ore and a regular foot wall at a depth of 100 feet. In connection with the works is a deep tunnel to facilitate operations. It is opened about 80 feet and will soon reach the lode. The character of the ores is carbonates, sulphurates and chlorides of silver, with a small percentage of lead. They are very high grade, as proved by assay. The surroundings of the mine are very favorable, both as regards location and facilities of transportation, besides being in close proximity to a mill now being erected on Tanner's ranch.

[ADDENDA TO FURNACES.]

The Davenport Silver Mining Co's.

Furnace erected in the fall of 1872 are situated at the mouth of Little Cottonwood Cañon, and consists of two cupola blast furnaces of a capacity of ten tons of bullion each per day. The motive power for the machinery is water, obtained from Little Cottonwood creek. Each furnace is provided with a separate blower which possesses many advantages in smelting. The buildings are very large and well ventilated—a feature sometimes neglected in the construction of smelting works. The ores used at these works are chiefly from the company's mines—the Davenport, Matilda, etc., of Little Cottonwood Cañon. The charcoal used as fuel is from Truckee, California and iron ore for flux from Rawlins, Wyoming Territory. The general management is vested in John H. Ely of this city and Jay H. Wooley, Superintendent, under whose supervision the works were erected. The plans were made by J. C. Cameron, Jr., and the mason work under contract by Evans and Morris of this city.

[ADDENDA TO BINGHAM CANON.]

In addition to the mines already mentioned the following should be noticed:

The Grand Cross is about one mile and a half

from Bingham City. The works consist of a shaft 22 feet and a tunnel 104 feet. The surface indications and the ore exhibited in the works, give promise of very favorable results. The Life Pine has a shaft down 101 feet, bringing to light a fine body of ore.

The Silver Shield has a shaft 90 feet deep and the appearances so far are very promising. *Salt Lake Tribune.*

The Metallurgy of Gold and Silver.

The metallurgy of precious metals does not hold that position in the scientific schools of this country that it should. This is a fact that is patent to any one, who, after passing through the best of them ventures upon the business of milling or smelting even with some practical experience in the general working of ores. The reason is probably to be found in the fact that the industry is comparatively a new one to Americans, and consequently its importance not fully comprehended. The west is yet young, and must for some years to come draw upon the older states for its guides in science, and it will prove an injury to technological and mining schools if they fail at this point.

Without presuming that the mines of the Rocky Mountains and Pacific Slope will prove to be the

The Greatest Wealth of the Country,

Or without even ranking them as of so great importance as the iron or coal deposits, it is certain that they will be worked with greater zeal and energy, simply because they are precious, and judging from their yield in past years will constitute a leading industry in the future. It will also be the case that a very large percentage of the yield of the ores when properly treated will be base metals, the market for which is constantly enlarging. Even at present all the silver producing Territories are shipping away more or less lead, and considerable copper in the form of matte is annually produced. Only the difficulties in the way of a cheap method of smelting retard the growth of base metal production, while the unlimited quantities of these ores, associated with those of gold and silver, are almost a positive guarantee of the future importance of the business.

Were all the

Gold and Silver of the West

Washed from the sand of its ancient rivers, or taken from the veins of free milling ore, there would certainly be some reason for placing the metallurgy of these metals at the foot of the list in importance, and the whole ground of their working might be covered by the elaboration of a few simple processes. This however is not the case. The palmy days of the rocker and long-tom are rapidly passing away, and raw amalgamation can only be adopted with a small proportion of ores now mined. Especially is this true in Colorado. Its gold does not save well in stamps and the majority of its silver ores are refractory in the extreme. The old processes of Europe will not answer without considerable modifications, not only on account of the higher rates of labor and material, but because a class of deposits are to be handled differing from most of theirs. Outside, but little is heard of the innumerable experiments and failures, while here everything is in earnest, and while the scientific men of the east are studying, and modelling after the old methods of the ancients, almost a new science is springing up in the mining west, in answer to the needs of the country.

In Colorado we are having the privilege of solving some of the most

Difficult Problems of Metallurgy,

And to the honor of the Territory it can be said that the numerous failures that have occurred, have not discouraged her mill-men, nor dampened their energy. We doubt if any other district on the continent can afford a more complete and varied study for the metallurgist. Its gold is found nearly always associated with iron and copper, the latter in quantities varying from three to twenty per cent. Its silver is in a majority of cases carried in zinc or lead ores, and often with an admixture of antimony and arsenic. Were only one or two of these present the difficulties would not be so great. As it is however a very small number of mines yield rock that can be properly handled in any other way than by a long and complicated process.

We have been forced therefore to experiment largely, and as experiment always necessitates some failure, the growth of the country has been retarded, and the investment of foreign capital checked and discouraged in exact proportion. The working of our ores, necessitating as it does a treatment also for the most valuable base metals, and a careful regard for those thieves of gold and silver, zinc, arsenic and antimony, is no mean study, and requires by far more skill and knowledge than is needed in iron and steel working. An acquaintance with the standard processes in use abroad is not sufficient for the successful metallurgist here, though of course the main principles of treatment are identical. A history of the mining districts of the west will show that American inventions and improvements in many cases are superseding foreign ones, and succeeding where they have failed.—*Colorado Mining Review.*

African Gold Mines.

A correspondent of the Springfield *Republican* sends an extract from a letter just received from a friend in the Natal colony, South Africa, whose information in regard to what is going on in that part of the world is reliable. It appears that the Tatin gold diggings, which attracted so much attention a few years ago, are thrown into the shade by the recent discoveries of the precious metal in the Transvaal (Dutch Republic), which is not far from Port Natal. The Tatin fields are at least 1,500 miles from this seaport: "There is a probability of the Marabasiad gold fields turning out a success. One reef is extremely rich, giving from \$70 to \$80 per ton of quartz. There are now some hundreds of men digging for alluvial gold, and they find it, although not in large quantities. In my last letter from there it was reported that one man had obtained an nugget of over half an ounce. Others have found very nice gold of about the size of barley-corn. Mr. Button, a scientific and enterprising Englishman, has formed a company in London, with a capital of £100,000, to work this reef. The new President, Mr. Burgess, from the Cape of Good Hope, has been to these fields, and proclaimed the whole country open to the world for digging purposes, on the payment of ten shillings for a license. (Quite accommodating this on the part of the Dutch.) Diamond digging becoming more difficult and expensive, many are leaving there and going after the gold. The diamond region has been formed into a separate State or Colony, with its own Government and Legislature, and with the control and expenditure of its own revenue. There now seems every probability that railways through the Natal Colony will soon be commenced. Surveys have been made. The first will be constructed along the coast to accommodate the sugar planters and cotton growers. Labor is at present our great want. It is both dear and scarce. Every native man asks 12 or 13 shillings per month. (Cheap enough, we Yankees would say.) Food is also very dear. Indian meal selling at 28s. per bag. Horses and mules are in many cases superseding oxen on the sugar estates. The mules are imported from South America."

American vs. British Mines.

The leading London papers, especially the *Times*, have been of late so severe in their denunciations of foreign mining securities, particularly American ones, that some facts derived from their principal mining authority, the *London Mining Journal*, may be of interest. During the year 1872 the British and foreign dividend-paying mines, in the London market, paid in dividends a total of £972,135 or \$4,860,675. Of British paying mines there are sixty-four; of foreign twenty-six. Yet the twenty-six foreign mines paid more in dividends than the sixty-four British mines. Utah alone in 1872 paid one-fourth of the total amount of dividends, both British and foreign. Of the twenty-six foreign mines, the twelve American paid over two-thirds of the dividends therefrom. Of the ninety-one foreign mines, thirty-five are quoted as dividend-paying (twenty-six only paid in 1872), equivalent to nearly forty per centum of the whole. Of the three-hundred and twenty-nine British mines, seventy-five only are quoted as dividend-paying (sixty-four only paid in 1872), or less than twenty-five per centum of the whole pay.

One American mine, on the borders of Utah, though in Nevada, the Raymond & Ely, paid almost as much as all the British mines put together, and nearly fifty per centum of all the mines on the London list, paying 69 per centum on its capital stock.

Surely American mines are good for something. Yet after perusing the British papers, one might be led to believe there was not a good mine in all America.

PLUMAS COUNTY MINES.—Of the mining outlook in Plumas county, the *Quincy National* says: "The prospect is that more money will be taken from our mines during the year of 1873, than for any previous year for a decade. A large amount of outside capital was invested in Plumas county gravel diggings last summer, and that capital will be returned to the fortunate owners with ten-fold interest. The good results from the investment of this capital will lead other capitalists to look this way, and in a very short time the county of Plumas will be ahead of any county in the State for extensive mining operations. This is no idle boast. The undeveloped resources of the county are immense, capital has already commenced the work of development, and more 'solid men' are coming. A feeling of security has taken the place of distrust, and one and all join in a hopeful prediction of the 'good time coming.'"

PACIFIC PORTS.—Complaints have been made to the Treasury Department that American Consuls at Valparaiso and ports of China are unable to furnish shipping masters with proper charts of the American Pacific ports, and as a consequence, vessels approaching these ports run great risk in navigation. Secretary Boutwell has directed steps to be taken to ascertain if the facts are as stated, and, if so, what remedy is necessary.

The annual pig iron production of the world is about 19,000,000 tons.

Plumbago Mines.

Plumbago, or graphite, is found in crystalline rocks, especially in gneiss, mica slate, and granular limestone, also in granite and argillite, and rarely in greenstone. Its principal English locality is at Borrowdale in Cumberland. In some years the net produce of the six weeks' annual working of the mine has amounted to £40,000. In the United States graphite occurs in large masses in veins in gneiss at Sturbridge, Mass. It is also found in Vermont, Pennsylvania, North and South Carolina, and New York. For the manufacture of pencils the granular graphite is preferred, and it is this character of the Borrowdale graphite which has rendered it so valuable. At Sturbridge, Mass., it is rather coarsely granular and foliated, and has been extensively worked; the mine yields annually about thirty tons of graphite. The mines of New York, Vermont, and North Carolina are also worked; and that of Ashford, Ct., formerly afforded a large amount of plumbago, though now the works are suspended. In addition to being used in the manufacture of pencils, graphite is extensively employed for diminishing the friction of machinery; also for the manufacture of crucibles and furnaces, and as a wash for giving a gloss to iron stoves and railings. For crucibles it is mixed with half its weight of clay. The composition of the mineral is 90 to 96 per cent. of carbon, with the rest iron. It is often called carburetted iron, but it is not a chemical compound. It is infusible before the blowpipe, both alone and with re-agents, and it is not acted upon by acids.

These being the properties of graphite, it is natural that it should be constantly increasing in demand, but for some time past the supply has wonderfully fallen off. The Cumberland mines, on which we depended it may be said for centuries for the supply of plumbago, have, it is well known, been all but worked out, the best quality entirely so, and with all the resources of modern chemistry and scientific appliances the market has been supplied with an inferior material to that produced (at an enhanced price) when the mines were in their palmy days. It is, therefore, a matter of public importance that new sources of supply should be opened up, and if the private view of the ore at the offices of Mr. Harvey, St. Clement's House, Clement's-lane, is to be depended upon, an almost inexhaustible supply of the richest quality has been discovered in Canada, which only needs capital and the requisite machinery to satisfy the public wants of this country and the United States, and at the same time to return large profits to those who embark in the undertaking. The property in question is situated near the village of Buckingham, on the River De Lièvre, a tributary of the Ottawa.

The price offered for plumbago for crucible purposes is now about 6d. per lb., in consequence of the great scarcity. For professional and artistic purposes, of course, the finer quality would bear a proportionate price. If the prospects opened out by the discovery of these mines—in connection with facilities for transit by rail and water carriage—are realized the mines will become most valuable to the public and to their proprietors. The largest and purest specimens are to be placed permanently in the School of Mines.

Quicksilver in Napa and Vallejo.

Since the late rich developments in the Summit quicksilver mine, seventeen miles north of Napa City, J. Perschbaker, the owner, has entered into a contract with forty Mexican miners who formerly worked in the quicksilver mines at New Almaden, to go to work, and as the mine is developed and the work requires them, he has arranged to increase the number to 150. The Mexicans are so well pleased with the developments already made and richness of the mine, that they have contracted to go to work on a percentage of the ore taken out.

The Vallejo quicksilver mines can now be claimed as a success, according to the *Vallejo Chronicle*, as a large body of paying ore has been developed, and the furnaces are being run to a profit to the owners of the mines. A party of Vallejo gentlemen visited the mines yesterday—explored the shafts, tunnels, drifts, etc., inspected the furnaces, and came back, well pleased with what they saw. The *Chronicle*, some two or three months since, mentioned the discovery of apparently a large, well-defined and paying body of ore. Since that time Mr. Neat has developed the ledge for a distance of thirty feet or more, and there is no prospect of its giving out at that point, and as a matter of course, Neat feels highly elated with the success which has at last attended his efforts in quicksilver mining. They are experiencing some inconvenience in not being able to haul lumber to the mines from town now on account of the bad roads. The lumber is wanted to timber up the excavations in the mine. Work on the large, eleven-ton furnace had to be suspended also on account of not being able to get bricks to the ground. The small furnace is running regularly producing about a flask of metal per day, which is worth from \$60 to \$65. Mr. Neat shipped eight flasks of quicksilver to the city last week. Ten men are now employed at the mines.

MILLS SHUT DOWN.—The extreme scarcity of fuel on the Comstock has had the effect of causing Parke & Bowie's tailings mill and several other mills on Six and Seven Mile Cañons to shut down temporarily.

SCIENTIFIC PROGRESS.

Do Plants Exhale Carbonic Acid?

Plants have commonly been thought to differ from animals in the gases which they secrete; the animals parting with carbonic acid, while the plant gave out oxygen. Dr. J. C. Draper, of New York, however, maintains that all living things, whether animal or plant, absorb oxygen and give out carbonic acid; and that the life of the plant is one continuous drinking in of oxygen gas. Having grown plants similarly nourished in the dark and in sunlight, he found that all the same parts were produced in both cases almost at the same times, and that the slightly slower evolution of the series grown in the dark is marked by a slightly smaller weight, while the same plant measured by night and by day grows slightly faster in darkness than in sunlight. The roots of plants grown under both circumstances throw out the same kind of excrement. Therefore, as the evolution and weight and root-secretion agree, he urges that the carbonic acid has been in both cases thrown off as a consequence of growth, and has never been absorbed by the roots and then given out as vapor from the leaves. In conifers and fungi, which, like seedlings grown in the dark, never give out oxygen, he appears to think that the carbonic acid they seem to give off is really only the carbon of the air left around the plant as a consequence of the rapidity with which the oxygen is absorbed; and when plants are producing their flowers and seeds, the rate at which they seem to part with carbonic acid is greater than with many animals at any time. Oxygen is given off only from the green parts of plants and trees—the leaves, twigs and young shoots; and only when the sunlight is falling on the leaves. Dr. Draper's argument might have been made even more convincing if he had availed himself of Boussingault's experiments, which showed that carbonic acid is decomposed day and night, by green leaves, in the ratio of one part by night to about sixteen parts by day.

Are We Witnessing the Formation of New Suns?

Some interesting observations have recently been made in regard to the colored stars about *Kappa Crucis*. Mr. H. C. Russell, of the Sydney Observatory sends to *Nature* an account of some observations which he has made in that portion of the heavens, and ventures the assertion that astronomers will gain fresh knowledge, especially with regard to the Nebular theory, by careful examinations of the phenomena developed in the direction of that beautiful cluster of stars.

Mr. Russell holds that it is beyond all question that, from some cause, there has, as in the direction of *eta Argus*, been recently developed a considerable increase of brilliancy about *Kappa Crucis*; also that there has been not only there, but in other directions in the heavens, a sensible amount of "clearing up" within the last twenty-five years. In other words that the process of the formation of new systems of stars is actually going on, before the eyes of the astronomer; that suns, by careful observations, may be detected in all stages of progress from the greatest nebulousity, "without form and void," to the finished sun, whatever that may be.

It is in this view, Mr. Russell thinks, we may find a rational explanation of the appearance of new stars in and about *Kappa Crucis*. But, whether we admit this or not, one thing is certain; we are not yet prepared to say, with certainty, that such changes are not going on in space, as will suffice for a full explanation of the undoubted appearance of the small new stars above alluded to, if not of the greater changes about *eta Argus*.

THE SILBER LIGHT.—An English inventor, a Mr. Silber, has lately made various improvements in oil lighting, to some of which the *London Times* of a late date refers in favorable terms. Among other lamps to which Mr. Silber has applied his principle are the side and mast-head lights used on ships. He has perfected a covering for these lanterns which, while permitting the free outward passage of heated air from the flame, is completely impenetrable to water washing over it. Waves breaking over side lights so constructed would have no power to extinguish the flame. Satisfactory experiments made with these lamps have amply proved their serviceableness. The principle of construction of these ship lanterns is analogous to that adopted to afford protection against currents of air in the case of street lamps and railway roof lamps. For domestic uses Mr. Silber has also made Moderator and Argand table-lamps, burning colza oil. Tests have shown that lamps constructed on this principle for the same consumption of oil will give 40 or 50 per cent. increase of light over those of ordinary construction.

Solar Flames—A Fearful Possibility.

In the course of a lecture on solar phenomena, delivered on Thursday Evening by Prof. Draper, before the University of New York, the speaker said: "There is one reflection connected with these solar eruptions that has a dire interest for us. If it be true, and there seems to be no doubt about the fact, that these streams of intensely heated hydrogen can be ejected from the body of the sun with a velocity which, if it endured, would bring that breath of fire to our earth in a few hours, what would be the effect of an eruption on a larger scale? What would happen to men and animals if an explosion as general as that in T. Cononae Borealis took place in our sun? In May, 1866, that star, which is usually invisible to the naked eye, suddenly flamed up till it was as bright as a star of the second magnitude. When examined by Miller and Huggins it was found to be enveloped by a prodigious atmosphere. In a few days it dwindled away and sank to its former insignificance.

But what must have been the fate of animated beings on the surrounding planets, if any such there were? They were undoubtedly consumed at once and utterly dissipated. Who shall say that our sun, which is a star, will not do the same to-morrow, or the next day, and thus the dread prediction of the Scriptures be realized at any moment? Most assuredly we have no guarantee to the contrary, and can only comfort ourselves with the reflection that while hydrogen is certainly there, and also an awful store of force to heat and project, if yet such convulsions are rare in the order of nature, and, therefore, the world may outlast our time. Nevertheless both astronomy and geology inform us that there have been periods of great variation in the heat-giving power of our sun, and we may well be disquieted at the possible approach of a time when "the heavens shall pass away with a great noise, the elements shall melt with fervent heat, and the earth also, and the works that are therein shall be burned up."

EXPERIMENTS ON THE RESISTANCE OF STONES TO CRUSHING.—Mr. C. B. Richards, C. E., has recently experimented upon various kinds of American building stones worked into 1 inch and 1½ inch cubes, with flat end smooth faces. The specimens were crushed between the plane faces of two hardened steel hemispheres, the curved portions of which were seated in corresponding cavities of steel blocks, fixed in the machine. Single thicknesses of lace leather were interposed between the stones and metal surfaces; thus the pressure was uniformly distributed; it was in all cases applied to the faces of the cubes parallel to the natural bed of the stone, and carefully increased to rupture by pouring shot into the hollow weight by which the strain was caused.

Sixteen specimens of granite from six quarries gave from 8,620 to 15,622 pounds, minimum, 9,838 to 13,778 pounds, maximum strength. Fourteen specimens of sandstone from 3 quarries gave 5,806 pounds minimum, and 8,956 to 10,928 pounds, maximum strength. And 10 specimens of white marble from 3 quarries gave from 3,905 to 12,917 minimum, and 5,976 to 13,972 pounds maximum strength. Each was a 1 inch cube. The specimens failed by breaking into slender prisms and pyramids with axes normal to the pressure.

O. W. HOLMES ON "DARWINISM."—O. W. Holmes asks and thus answers the question: What is the secret of the profound interest which "Darwinism" has excited in the minds and hearts of more persons than dare to confess their doubts and hopes? It is because it restores Nature to its place as a true divine manifestation. It is that it removes the traditional curse from that helpless infant lying in its mother's arms. It is that it lifts from the shoulders of man the responsibility for the fact of death. It is that, if it is true, woman can no longer be taunted with having brought down on herself the pangs which make her sex a martyrdom. If development upward is the general law of the race, if we have grown by natural evolution out of the cave-men, and even less human forms of life we have everything to hope for the future. That the question can be discussed without offense, shows that we are entering on a new era, a revival greater than that of letters, the revival of humanity.

A NEW GALVANIC BATTERY.—Gaiiffe's new galvanic battery consists of a vessel in which are contained a plate of lead and a plate of zinc. The lead reaches to the bottom, while the zinc is but half as long. The bottom of the vessel is covered with a layer of red oxide of lead, and the exciting fluid is water containing 10 per cent. of sal ammoniac. The electro-motive power of this battery is estimated at one third that of a Bunsen cell. Its internal resistance is very slight and it is said to be very constant. It has the merit of cheapness.

NEW HYGROSCOPIC TESTS.—A new test paper to indicate the amount of atmospheric moisture has been suggested. It is a kind of a hygroscopic, in which use is made of the property of salts of cobalt, to be bluish when dry, and to become reddish by moisture. Strips of paper are dipped in a solution of cobalt salt, common salt and mucilage, and preserved in a tight bottle. When exposed to the air, a change from blue to pink gives an indication of the amount of moisture.

MOLECULAR PHENOMENA OF IRON.—M. Yore mentions an interesting fact concerning iron when under the influence of heat and strains. A strained iron wire was heated to redness by a current of voltaic electricity, and then, the current being discontinued, was allowed to cool. It was observed that there arrived a moment in the process of cooling at which the wire suddenly elongated, and then gradually shortened, until it became perfectly cold, remaining, however, permanently elongated. No other metal besides iron is known to exhibit this peculiarity—and the phenomenon is supposed to be owing to a momentary molecular change. This change, it is thought, would probably happen in large masses of wrought iron, and would come into operation in various cases where these masses are subjected to the conjoint influence of heat and strains.—*Iron Age*.

BLOOD GLOBULES.—The number of blood globules is greater in mammals than in birds, in the latter than in fishes. The number is almost always in an inverse ratio to the volume of the globules; the relation between number and volume is not proportional. Birds gain more by the augmentation of the volume of their blood globules than they lose by the diminution in their number.

IMMUTABILITY OF SPECIES.—Cats and dogs embalmed in Egypt four thousand years ago are precisely like those of to-day, said the late Sir David Brewster. What have the revolutionists to say to that fact? Four thousand years are nothing, so gradually are organic changes brought about—would probably be the Darwinian answer.

MECHANICAL PROGRESS.

The Band Saw and Band Sawing.

The future of the band saw is hard to predict; judged upon general principles, and by the saws that govern sawing, we are at once led to conclude that it must supplant every other method. The advantages are so many, and so obvious, that nothing but insurmountable mechanical difficulties can prevent its becoming the standard saw for every kind of use. Analyzing the principles of its action, we may be said to have a blade of superior thinness, capable of tension in varying degrees, moving in right lines through the material, at a speed that is almost unlimited, and can exceed that of circular saws; operating too by machinery consisting only of rotating parts, and of the most simple construction, the sawdust all carried down through the timber offering no obstruction in following lines.

Add to this the peculiar adaption of the band saw to curved lines, and its advantages cannot be overestimated. The speed of sawing, or the cost of sawing, which is much the same thing as the movement of the teeth, is with the band saw almost unlimited. Its performance, contrasted with reciprocating saws for cutting plain sweeps or scroll work, shows a gain of time, or cost, of three or four to one, with the important advantage of being easier to operate, and we may also term it a popular machine with workmen.

Mechanical Difficulties in the Way of its Introduction.

Considering these many important advantages, it would be strange and unusual if they were to be attained without combating mechanical difficulties, that must necessarily exist for a time in every new discovery. The flexion of the steel in passing over the pulleys tends to crystallize and break the saw, unless there is that degree of temper and texture which is known to withstand this bending. This has been the crowing obstacle to the introduction of band saws. It is true that saw manufacture, or steel manufacture, had not until recent years been sufficiently understood to produce perfect blades at low prices. Yet if it had not been for the fear of breaking blades, the band-saw machine, invented seventy years ago, would long since have taken its place as a standard machine for wood cutting. Joining the blades too was regarded as a most difficult operation. Holzappel in his celebrated work on mechanical manipulation, after noticing the band-saw machine of Newberry, already described, speaks of it as a curious machine, and alludes to the supposed difficulty of joining the ribbons, or saws, as an obstacle to its use. That the opinion was based upon experiments we can hardly conclude, for soldering and brazing iron and steel were certainly practised at that date, and well understood.

This matter of joining blades, which will be further noticed, has disappeared as a difficulty, and become so simple a thing as to be performed in a few minutes by those that have no other knowledge of metal working. The breaking of the saw blades by flexion, the first and greatest objection to band sawing, is fast giving way before the improvements in steel and saw manufacture, and before improvements so less important in the machinery for operating the saws.

Joining the blades is no longer a difficulty, but a most simple operation. However there still remains another condition to be overcome that threatens to be more serious, that of resisting the back thrust in band saws. This

matter would at first seem to be one of no great importance, or at least one that would not suggest itself except in actual experiment, and hence it has not had much notice, for up to the present time the use of hand saws has been almost wholly confined to scroll cutting and other kinds of work, when hand feed only has been employed, and the back thrust so inconsiderable as to cause no trouble.

When positive power feed is applied, however, a new set of conditions arise, and the question is, how to resist the abrasion and heat, with a very limited amount of surface, moving at a high velocity, and incapable of being lubricated.

Having stated the general principles that seem to lie at the bottom of band sawing, we now come to the mechanism of machines, and the operation of the saws. Being comparatively a new thing, there is not the usual data on which to base either plans of construction or rules for operating; yet if the development of this business were waited for, there would be but little need of a treatise of any kind to give such information.—*Richard's Treatise on Wood-Working Machines*.

[To be continued.]

A New Railway Brake.

The *Chicago Railway Review* contains the following description of a new atmospheric railway brake, invented by T. E. Sickles, chief engineer and superintendent of the Union Pacific Railroad, and designed to remedy the objections to the Westinghouse contrivance, and especially the use of the air pressure to apply the brake.

Mr. Sickles, in his apparatus, uses a spring to apply the brake, and the air pressure to take it off. The normal condition of the train is with all the brakes applied by action of the springs. If the engineer wishes to start the train he lets on the air pressure, which detaches the spring and leaves the wheels free to move; the pressure is kept upon the pipes, and so long as this done the brakes are kept released.

To apply the brakes, a portion of the whole of the condensed air in the pipe is let off, and the action of the springs applies the brake.

If there be any defect in the connecting pipe, the result can not be serious, the only effect being that the result can not be started, and the engineer must stop and repair the pipe, and re-establish the air pressure before the wheels can run. In the Westinghouse apparatus the engineer has to find out defects by trying to stop, instead of start the train, and the knowledge may be obtained at fatal cost. Suppose, with Sickles' apparatus, that the train breaks in two, the break lets the air out of the pipes, the springs apply themselves to each car, and the entire train is brought to rest.

The entire train is under the instant control of either the conductor or the engineer. By having a cock in each car leading to the air pipe, the conductor—an accident having occurred to any portion of the train—can apply the brake from any car to the entire train; and this he can do as gradually or suddenly as he pleases, by regulating the discharge of air from the pipe. The brake is automatic in case of a brake in the train; the conductor (or a brakeman or passenger, for that matter) can apply it, and the train can not be run unless the apparatus is in order.

ANCIENT TIMBER.—Probably the oldest timber in the world, which has been subjected to the use of man, is that which is found in the ancient temples of Egypt. It is found in connection with stone-work, which is known to be at least 4,000 years old. This wood, and the only wood used in the construction of the temple, is in the form of ties, holding the end of one stone to another in its upper surface. When two blocks were laid in place, then it appears that an excavation about an inch deep was made in each block, into which an hour-glass shaped tie was driven. It is therefore very difficult to force any stone from its position. The ties appear to have been the tamarisk, or chittim wood, of which the ark was constructed, a sacred tree in ancient Egypt, and now very rarely found in the valley of the Nile. Those dovetailed ties are just as sound now as on the day of their insertion. Although fuel is extremely scarce in that country, those bits of wood are not large enough to make it an object with Arabs to leave off layer after layer of heavy stone for so small a prize. Had they been of bronze, half the old temples would have been destroyed ages ago, so precious would they have been for various purposes.

THE NEW MODE OF PILE DRIVING.—James Cass, who is building a wharf at Caytics, on Monterey Bay, being unable to procure a pile-driver, resorted to the novel method of screwing the piles into the ground. He cut a thread, screw-fashion, at the end of each pile, and then after sinking the stick or pile a short distance into the loose soil or sand, worked it windlass-fashion until it had reached a sufficient depth to be firm and secure.

A PECULIAR LOCOMOTIVE.—A new locomotive named the *Anthraxite*, which has been placed on the Albany and Susquehanna Railroad, has six driving wheels and carries its water above the boiler. A tender is thus dispensed with. The firing apparatus is stated to be so arranged that the fires last all day without replenishing, and the furnaces only require damping once a week.

OUR MINING SHAREHOLDERS' DIRECTORY.

[COLLATED WEEKLY FROM ALL NOTICES ADVERTISED IN S. F. JOURNALS.]

ASSESSMENTS.									
Name of Co.	Location.	Secretary.	S.F. Office.	Assmt.	Levied.	Delinq't.	Sale.		
ADMIRAL NELSON T. & M. CO. Utah.		R. H. Sinton.	Room No. 1-Mt. Mtg's B'k.	10	Jan. 27	Mar. 8	Mar. 31		
Aln-S. M. Co.	Ely District.	C. S. Neal.	492 Montgomery St.	59	Feb. 14	Mar. 24	Apr. 15		
ANGELS G. M. CO.	Cal.	Geo. Condon.	408 California St.	150	Mar. 4	Apr. 3	Apr. 20		
Antelope G. M. Co.	Placer Co.	W. C. B. Smith.	41 1/2 Cal. St.	10	Feb. 15	Mar. 2	Mar. 20		
Arizona & Utah.	Waschoe.	J. Maguire.	416 California St.	50	Feb. 15	Mar. 21	Apr. 9		
Arkansas M. Co.	Ely District.	J. H. Applegate.	729 Montgomery St.	60	Jan. 18	Feb. 26	Mar. 22		
Atlantic and Pacific Con. G. M. Co.	Cal.	C. S. Neal.	416 California St.	6	Jan. 25	Mar. 13	Apr. 19		
Amberg G. M. Co.	Cal.	R. Wegener.	416 California St.	6	Jan. 25	Mar. 13	Apr. 19		
Buckeye & G. S. M. Co.	Waschoe.	J. Maguire.	419 California St.	10	Jan. 21	Feb. 25	Mar. 18		
Caaveras G. M. Co.	Cal.	F. E. Wingard.	318 California St.	25	Feb. 12	Mar. 18	Apr. 8		
California S. M. Co.	R. Waschoe.	W. L. Crum.	416 California St.	10	Jan. 21	Feb. 25	Mar. 18		
Cederburg First North Ex. Co.	Cal.	J. N. Webster.	506 Montgomery St.	10	Feb. 3	Mar. 17	Apr. 17		
Cederburg First South Ex. M. Co.	Cal.	J. N. Webster.	506 Montgomery St.	5	Dec. 27	Mar. 12	Mar. 30		
Charter Oak S. M. Co.	Cal.	J. W. R. King.	41 California St.	25	Mar. 3	Apr. 9	Apr. 24		
Chico and Blue River Gravel M. Co.	Cal.	H. R. Knorr.	633 Washington St.	1	Mar. 1	Apr. 1	Apr. 1		
Chief of the Hill M. Co.	Ely District.	C. S. Neal.	402 Montgomery Street.	50	Jan. 15	Feb. 20	Mar. 19		
Chollar-Potosi M. Co.	Waschoe.	W. E. Dean.	419 California St.	50	Feb. 13	Mar. 19	Apr. 14		
Comstock S. M. Co.	White Pine.	H. H. Blake.	402 Montgomery St.	150	Feb. 7	Mar. 15	Apr. 7		
Concha S. M. Co.	Cal.	J. P. Medina.	429 Cal. St.	10	Jan. 21	Feb. 25	Mar. 18		
Dauphin & Co.	Butte Co., Cal.	G. F. Balcom.	426 Montgomery St.	40	Jan. 8	Feb. 17	Mar. 8		
EAGLE O. M. Co.	Santa Barbara Co.	Wm. H. Watson.	302 Montgomery St.	50	Jan. 18	Mar. 19	Mar. 24		
Empire M. Co.	Idaho.	F. E. Balcom.	328 Montgomery St.	100	Jan. 6	Feb. 15	Mar. 8		
Excelsior M. Co.	Cal.	C. S. Neal.	Merchants' Exchange.	10	Jan. 22	Mar. 12	Mar. 22		
Excelsior Gravel M. Co.	Idaho.	P. W. Van Winkle.	304 California St.	50	Jan. 14	Feb. 22	Mar. 19		
Golden Chaiori M. Co.	Idaho.	L. Kaplan.	Merchants' Exchange.	250	Jan. 21	Feb. 24	Mar. 19		
Gravel and Sand M. Co.	Cal.	A. K. Warburton.	Merchants' Ex.	10	Feb. 14	Mar. 17	Apr. 7		
Granite Tunnel M. Co.	Cal.	W. G. Holmes.	43 Cal. St.	6	Feb. 17	Mar. 17	Apr. 7		
Gray & Bishop S. M. Co.	Ely District.	S. Phillips.	415 Montgomery St.	25	Feb. 21	Mar. 25	Apr. 18		
Harvey S. M. Co.	Ely District.	J. R. Wilda.	308 Montgomery St.	10	Jan. 29	Mar. 31	Apr. 23		
Hawley S. M. Co.	Idaho.	W. C. Howard.	415 Montgomery St.	20	Jan. 29	Mar. 31	Apr. 23		
Hoyle Gravel M. Co.	Grass Valley.	L. Kaplan.	Merchants' Exchange.	50	Jan. 17	Feb. 20	Mar. 10		
Hunn & Hunt S. M. Co.	Ely Distri t.	L. Kaplan.	Merchants' Ex.	100	Feb. 21	Mar. 19	Apr. 19		
Ia Elmore.	Idaho.	Win. Willis.	419 Cal. St.	250	Jan. 23	Feb. 24	Mar. 20		
Imperial S. M. Co.	Ely District.	C. S. Neal.	402 Montgomery St.	10	Jan. 23	Mar. 12	Mar. 22		
Imperial S. M. Co.	Waschoe.	W. E. Dean.	419 Cal. St.	100	Jan. 23	Feb. 27	Mar. 21		
IMPERIATRICE EUGENIE G. M. CO.	Cal.	Gustave Berson.	712 1/4 Washington St.	50	Jan. 15	Mar. 22	Apr. 18		
JACKSON M. CO.	Eureka District.	H. C. Kibbe.	419 Cal. St.	10	Feb. 23	Mar. 26	Mar. 28		
Johnston and Quicksilver M. Co.	Cal.	C. S. Neal.	395 San Francisco St.	20	Mar. 2	Apr. 1	Apr. 1		
Junius Co. M. Co.	Esmeralda Co., Nev.	C. S. Neal.	402 Montgomery St.	65	Jan. 17	Feb. 24	Mar. 17		
Justice M. Co.	Waschoe.	R. Wegener.	414 California St.	150	Feb. 18	Mar. 25	Apr. 15		
Kentuck M. Co.	Ely District.	F. Smith.	415 Montgomery St.	10	Feb. 8	Mar. 12	Apr. 1		
Kentuck M. Co. S. M. Co.	Ely District.	A. D. Waller.	506 Montgomery St.	10	Feb. 8	Mar. 12	Apr. 1		
Lady Emma M. Co.	El Dorado Co., Cal.	A. D. Carpenter.	505 Clay St.	15	Feb. 26	Mar. 29	Apr. 21		
Lady Ellen T. & H. Co.	Utah.	C. S. Haily.	Merchants' Ex.	6	Jan. 13	Feb. 13	Mar. 1		
LADY FRANKLIN G. & S. M. CO. Cal.		C. S. Luby.	507 Montgomery St.	50	Feb. 18	Mar. 31	Apr. 25		
LE CAZ M. CO.	Ely District.	B. E. Minor.	415 Montgomery St.	10	Feb. 18	Mar. 25	Apr. 15		
LEMON M. & M. CO.	Cal.	T. T. Milliken.	505 Merchant St.	10	Feb. 12	Mar. 15	Apr. 8		
Lillian Hall M. Co.	Ely District.	T. D. Bagley.	401 Cal. St.	25	Jan. 23	Mar. 3	Mar. 28		
MACK KIELD G. M. CO.	Cal.	J. L. Small.	32 Kearny St.	10	Feb. 18	Mar. 25	Apr. 1		
Mammoth S. M. Co.	White Pine.	J. L. King.	411 California St.	10	Feb. 18	Mar. 25	Apr. 23		
Mingdon M. Co.	Sciell Creek.	G. R. Spomer.	320 California St.	25	Feb. 24	Mar. 23	Apr. 23		
MEAD-W. VALLEY EASTERN M. CO.	Cal.	W. C. Whurn.	419 California St.	10	Jan. 16	Feb. 25	Mar. 21		
MENARD S. M. CO.	Cal.	W. J. Wells.	419 California St.	1	Feb. 21	Mar. 27	Apr. 21		
National M. Co.	Nye Co., Nev.	Geo. D. Gray.	34 Market St.	10	Feb. 20	Mar. 27	Apr. 21		
Newark S. M. Co.	Ely District.	T. D. Bagley.	401 Cal. St.	50	Jan. 27	Mar. 7	Apr. 21		
Newton Booth Con. M. Co.	Ely District.	J. F. Singling.	314 California St.	25	Feb. 23	Mar. 22	Apr. 14		
NORTH STAR S. M. CO.	White Pine Co.	J. H. Maguire.	419 California St.	50	Feb. 12	Mar. 17	Apr. 14		
OCCIDENT S. & S. M. CO.	White Pine.	J. A. Mc Island.	414 Montg'y St.	50	Jan. 21	Feb. 25	Mar. 14		
OCCIDENTAL M. Co.	Storey Co., Nev.	O. E. Elliott.	419 California St.	75	Feb. 8	Mar. 17	Apr. 7		
OHIO CON. G. M. CO.	California.	W. A. Knapp.	432 Montgomery St.	10	Feb. 11	Mar. 15	Apr. 9		
Old Dominion M. Co.	Cal.	W. A. Knapp.	Merchants' Exchange.	3	Mar. 1	Apr. 1	Apr. 1		
Page & Panaca S. M. Co.	Ely Dist.	L. Kaplan.	Merchants' Exchange.	50	Feb. 3	Mar. 11	Mar. 11		
Peavine S. M. Co.	Ely District.	G. F. Balcom.	426 Montg'y St.	25	Jan. 28	Mar. 5	Mar. 5		
Pictou M. Co.	Waschoe.	S. Phillips.	415 Montgomery St.	20	Feb. 24	Mar. 19	Apr. 3		
PIONEER M. CO.	Cal.	W. A. Knapp.	415 California St.	10	Feb. 24	Mar. 19	Apr. 3		
Pioche-Pioche M. Co.	Ely District.	O. E. Elliott.	419 California St.	10	Feb. 1	Mar. 11	Apr. 24		
Pioche S. M. Co.	Ely District.	O. E. Elliott.	419 California St.	10	Feb. 1	Mar. 11	Apr. 24		
Pocomontas M. Co.	El Dorado Co.	A. D. Jennings.	401 California St.	50	Jan. 8	Mar. 7	Mar. 7		
RAIDERS COAL CO. M. CO.	Nevada.	W. C. Whurn.	419 California St.	10	Feb. 21	Mar. 27	Apr. 21		
Rising Star.	Idaho.	Wm. Willis.	419 California St.	100	Jan. 9	Feb. 15	Mar. 12		
Rising Star.	Eureka Dist. Cal.	J. M. Boulton.	Merchants' Ex.	15	Jan. 15	Feb. 13	Mar. 9		
SAN ERASO G. M. CO.	Cal.	Wm. Sont.	418 California St.	15	Jan. 14	Mar. 17	Apr. 9		
San Joaquin M. Co.	Ely District.	J. H. Applegate.	729 Montgomery St.	10	Jan. 27	Mar. 8	Mar. 31		
Santa Cruz Coal M. Co.	Cal.	L. Kaplan.	Merchants' Ex.	20	Jan. 9	Feb. 17	Mar. 15		
SCORPION S. M. CO.	Nevada.	Wm. H. Martin.	32 Kearny St.	50	Feb. 6	Mar. 12	Mar. 29		
Sennors S. M. Co.	Waschoe.	H. Boyle.	Stevenson's Buildg.	10	Feb. 11	Mar. 8	Mar. 27		
SERRA S. M. CO.	Ely District.	J. H. Boyle.	Stevenson's Buildg.	10	Feb. 11	Mar. 8	Mar. 27		
SILVER WAVE M. CO.	Nevada.	J. W. Clark.	418 California St.	50	Jan. 23	Mar. 14	Apr. 8		
South Chiorit M. Co.	Idaho.	J. L. King.	411 California St.	50	Feb. 13	Mar. 22	Apr. 8		
SPRING MOUNTAIN M. CO.	Nevada.	W. C. Whurn.	419 California St.	25	Jan. 15	Feb. 25	Mar. 14		
STATE OF MAINE M. & M. CO.	Cal.	H. B. B. Smith.	438 Montgomery St.	10	Feb. 1	Feb. 24	Mar. 17		
Summit M. Co.	Amador Co., Cal.	Guo. Davidson.	734 Montgomery St.	25	Feb. 8	Mar. 14	Apr. 4		
Table Mountain Blue Gravel M. Co.	Cal.	W. L. Ustick.	423 California St.	25	Jan. 30	Mar. 4	Mar. 25		
TALAMOUNTAIN ALPH M. CO.	Cal.	W. L. Ustick.	423 California St.	10	Jan. 30	Mar. 4	Mar. 25		
Temenie S. M. Co.	Ely District.	S. Phillips.	415 Montgomery St.	10	Feb. 7	Mar. 10	Apr. 3		
Teumsh S. S. & G. M. Co.	Cal.	F. J. Hermann.	418 Kearny St.	25	Feb. 24	Mar. 31	Apr. 21		
Washington & Crede M. Co.	Ely Dist.	F. D. Cleary.	419 California St.	50	Jan. 22	Mar. 6	Mar. 31		
WATERBURY M. CO.	Cal.	W. A. Knapp.	306 Montgomery St.	10	Feb. 24	Mar. 17	Apr. 9		
Yellow Jacket M. Co.	Waschoe.	G. W. Hopkins.	Gold Hill.	50	Jan. 24	Feb. 4	Mar. 8		

On Friday the market was dull and weak, with no fluctuations of consequence. On Saturday it was not

fluctuations of consequence. On Saturday it was not

[S. F. Stock and Exchange Board.]

THURSDAY EVENING, March 6

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned:

California.

ALPINE COUNTY.

TARSHISH.—*Alpine Miner*, March 1: Among the returns from assay made last week was this:—Gold \$5 185 72; Silver \$563 39.—Total

I. X. L.—Rumor has it that the I. X. L. Co. have a fine pay ledge in the bottom of the Buckeye No. 1 shaft. This Co. and the Exchange, both running steam hoisting work,

ner are both running steam hoisting works, and expect to be able to supply the mill on Silver Creek with pay ore as early as it can be hauled down from the mine.

AMADOR COUNTY.

HINCKLEY.—Amador Ledger, March 1: After sinking some 40 ft. in the new shaft on this mine they were compelled to give it up on ac-

count of the heavy flow of water. They are now taking out some fine rock from one of the old shafts, though they are not so deep upon the ledge.

KENNELLY.—This mine is holding its own. The Co. are rapidly sinking on the new shaft. The new hoisting works and machinery are working finely, and it is expected that the work-

men will strike the main lead at about 400 feet.

BACON.—We are informed that the proprietors of this mine will erect steam hoisting works and start up about the last of the present month.

GALAVRAS COUNTY.

GWIN.—Calaveras *Chronicle*, March 1: Sinking the south shaft another 100 ft. in depth will commence shortly. The yield of this mine con-

commence shortly. The yield of this mine continues to be great, and there is no interruption of operations. When the next sinking is completed the mine will be opened to the depth of 700 feet.

THE following is mostly condensed from journals published in the interior in proximity to the mines mentioned:

FROM THE PHOTOVOLTAIC, $P = 0.001$ TO 0.002 WATT PER SQUARE CM.

ALPINE COUNTY:

GARLAND MILL.—We learn that this mill at Mosquito Gulch will shortly commence crushing rock from Albright & Rechenbach's mine. Those gentlemen have about 45 tones of ore on their dump that prospects largely and is expected to reward the owners of the mine well for their labor.

MOKELUMNE WATER Co.—This Co's ditch is now thoroughly repaired and any danger from future slides guarded against. There is water in abundance, and all the mining companies

are busily at work, paying no regard to the inclement weather. The great fall of snow in the mountains—protected as it is and has been by

unusually cold weather—is sufficient assurance

that there will be no lack of water during the approaching dry season.

RAILROAD FLAT DISTRICT.—Petticoat stopped work in 450 ft. north level. South level is nearly 500 ft. and extending.... A huge hoiler is being put in position at the Sanderson.

Mosquero District.—The superintendent of the Good Hope is raising in the tunnel for the

purpose of sinking a main shaft below the level of the tunnel. The low grade ore, crushed recently, added to the confidence in the mine. Snow having disappeared a number of other

WEST POINT DISTRICT.—Ohio Consolidated, sinking.... The Zacatero will start up soon, and in good shape.... J. Griggs & Co. have been compelled to quit work in their drain tunnel at

compelled to quit work in their drain tunnel at times. In the mean time they have extracted very fair ore from the surface works.... Woodhouse has some 400 tons of ore on dump. The owners will erect a 10 stamp mill on the mine

STICKLE.—The 20 etampe of this mill are kept going night and day. A few days since

CALAVERAS GOLD MINING Co.—Calaveras Citizen, March 1: This is a Co. organized for the purpose of working three quartz leads located on Indian Creek, about five miles from Murphy's, in this county. The Co. has erected a first class 20 stamp mill with self feeders, amalgamators, Paul processer, etc.—the whole being run by a 90 horse power engine.

dred tons of ore on the dump of a quality superior to any yet crushed. There are 4 shafts on the Co's property, the deepest being down 250 ft., with a well defined lead in the bottom, averaging from \$40 to \$250 per ton. The rock has paid an average of \$20 per ton. The rock

SANDERSON.—They have purchased the engine and boiler at the Hepburn Mill, and are put-

ting them in position on the mine. The 100 ft. level has developed an extensive deposit of high-grade ore.

WOLVERINE.—This mine is also looking extremely well. The last "sink" of 120 ft. has demonstrated the value of quartz ledges in this District, and completely refutes the idea that the pay ore is all near the surface.

PETTCOAT.—This mine has no new developments of importance. The Co. continue to burn large quantities of wood and blast powder in extending the 450 ft. level south from the shaft, with no ore in the face. In fact, this level, 300 ft. in length, has not produced a pound of quartz. If the present workings of this mine had been sunk 600 ft. north from where it is, it would long ago have been producing dividends.

ITEMS.—We learn that times are lovely in the lower end of the county. At Jenny Liad, Craig & Company, are running on good dirt. At Whisky Hill the Bunker Hill Company are running their large hydraulic very successfully. This claim was recently purchased by Mr. George F. Sharp, of San Francisco. A run has already been made this season, which paid over \$100 per day. The Whisky Hill tunnel claim will commence washing again in a few days. A company of practical miners are putting large hydraulic machinery on North Hill, and expect to be running within ten days. This will develop a very extensive body of rich gravel. The Salt Spring Valley Reservoir, belonging to the Quail Hill Mining Water Co. is filled with water, which guarantees a full supply of water until next winter.

EL DORADO.

POAHONTAS.—Cor. *Mountain Democrat*, March 1: I was down in the mine to the 500-ft. level, where the seam of quartz is literally packed with gold. I was astonished with the dazzling sight. The chamber is about 100 ft. in length from the bottom of the shaft; and penetrates the rich seam about 30 ft., the ledge is about 3 ft. thick, of unknown depth, with thousands of tons of rock overhead, which it is fair to suppose is as rich as that which is now in sight.

A HOME DEVELOPMENT.—On Wednesday last Messrs. Shepard and Whitton struck a rich body of pay ore in a shaft they lately commenced sinking on their ledge at a point just back of the Episcopal Church, hardly more than 100 yards from this office. The ledge is clearly developed, with well defined hanging and foot-walls of slate presenting a glassy smoothness of appearance. The body of quartz between the walls is fully 5 ft. in thickness, and from Spring Ravine to the shaft in question they have traced and prospected it with highly satisfactory and very uniform results. In the new shaft they have sunk only 10 ft. The quartz taken out last Wednesday is of an extremely friable and porous character, showing a liberal sprinkling of free gold throughout its surface, and ponding out on rough test at the rate of about 10 cents per pound or \$200 per ton.

MARIPOSA COUNTY.

MARIPOSA ESTATE.—*Mariposa Gazette*, Feb. 28: An increase in the working force on the Bear Valley Mines was made last week and it is reported that the Pine Tree and Josephine Veins are to be worked and that the prospect of good paying ore in both is redoubled to a certainty. It is in contemplation to reopen the Princeton Mine this spring, and to construct a railroad from that point to the Benton Mills. The new vein, discovered by Mr. Easton, is said to be yielding rich ore.

WASHINGTON.—Work is still in progress on the vein and the rock now being taken out looks well. The mill has been temporarily stopped and is being overhauled and repaired.

Cor. from Indian Creek, Feb. 8: Work at mining is going on as usual. Hambridge & Gonnigall, in the Quail Lead, have struck splendid rock in the "shnte," where they are cutting upward for an air shaft.

On Gentry's Gulch, Mr. Coward is still busy getting his mill ready. Mr. Shiner, on Bean's Creek, is nearly down with his new shaft, which shows good rock on each side.

NEVADA COUNTY.

IDAHO.—*Grass Valley Union*, March 4: This mine's monthly run closed on Saturday, the 22d of February. The mill (35 stamps) worked 22 days, and gave gold to the value of \$75,000. For the 6 days ending last Saturday the Idaho cleaned up about \$20,000, which is to be aggregated with the proceeds of the current month. The January run of the Idaho gave about \$72,000.

EUREKA.—This mine with 10 stamps has given about \$47,000 for a month's run. We regret to state that no changes for the better have taken place in the lower depths.

SLATE.—This ledge has done but little crushing during the month, because the roads were so soft that it did not pay to haul the ore from the mine to the mill. Hauling commenced yesterday and the mill was immediately started up. There are about 100 tons of good ore on the dump at the mine. The ledge is large and shows rich mineral.

COE.—This mine has just finished repairing and retimbering the main shaft. A contract to sink the main shaft 50 ft. lower, with the privilege to the contractors to sink 100 ft., was let yesterday.

DAISY HILL.—The mine still continues to send out good milling ore, and has a good sized dump ready for crushing. The last crushing gave \$42 to the load, and the rock now on the dump will, it is estimated, come up to those figures in yield.

GREENHORN.—The mill and mine are working away night and day. The ledge is large, with

beautiful walls, giving every assurance of permanency. The crushing now going on will give something like \$25 to the ton of ore.

GREEN MOUNTAIN.—This mine, during its last business month, made a run of 18 days with its 5 stamp mill, cleaning up gold to the amount of \$2,545. The value of the sulphurets saved is not counted.

HOWARD HILL.—This mine shows a most gratifying improvement. The shaft is down 390 ft. and from the bottom drifts have been run east and west. Both drifts are in good paying ore, with a ledge from 2 to 2½ ft. thick. The quartz of the ledge will pay, according to the judgment of experienced men, at least \$20 a ton. The present workings of the Howard Hill are 100 ft. lower down than any former workings of the mine.

GRASS VALLEY NEW MINING Co.—At present they are prospecting on a ledge formerly known as the Imperial, about one mile from Grass Valley on the Nevada road, on which they are now sinking a fine timbered shaft, 9x1½ ft. in the clear and have a good ledge from 20 inches to 2 ft. thick which prospects well.

PROSPECT M. Co.—They are at present prospecting on the West Idaho ledge on Slate Creek, on which they own 3,000 ft. This ledge was worked some 2 years ago by a company which sunk several shafts, probing the ledge for some 2,000 ft. to water level, with flattering results. From where they are now drifting by the time they reach the center of the hill with their tunnel of 500 ft. with the opportunity of going 150 lower should they wish it at some future time. The ledge has a fine appearance showing free sulphurets, galena and free gold.

KENTUCKY.—This ledge has had considerable money taken out of it in former years, the last 149 loads of rock averaging \$17 per load, and some paying as high as \$30. There has been considerable excitement on this claim lately, in consequence of striking good ore 400 ft. from the main shaft, while doing a few days' work to hold the ground.

INDEPENDENCE CON.—This Co. is still running a tunnel through Independence Hill, near Deadman's Flat. The tunnel is now in the distance of 375 ft., and the rock is very hard. During the last month a foot a day was averaged in running the tunnel. The ledge has not yet been cut, though stringers that bear gold are in the tunnel. The stringers prospect well.

NORTH STAR.—The mine continues to have splendid ore in the new shaft.

GRAVEL MINES.—The hope is on the assessment roll just at this time. Work is being done all the time at the lower depths of Alta Hill.

The Dartmouth is sinking a shaft on the north end of Grass Valley slide, which is the east end of Alta Hill. The gravel from the shaft is being put through a five-stamp battery and the yield is paying expenses.

The Town Talk is doing a little better than it has done heretofore. The mine has paid a clear profit, for two years past, of \$1,200 a month.

The Independent Gravel Co. has a good lead, which adjoins the Town Talk. The gravel and cement are put through the crushing process which saves almost all the gold. This gravel lead appears to run through the Howard Hill claims. In other words, the Howard Hill has good quartz and splendid gravel.

The Picayune Gravel Co., near Rough and Ready, continues to pay largely over the cost of development.

PLACER COUNTY.

ST. PATRICK CO.—*Placer Argus*, March 1: This Co. are prosecuting the work of development on the Crater Mine. The present engine-shaft is being sunk from the 150 ft. to the 230 ft. level. A cross-cut is being driven northerly for the purpose of intersecting the main ledge, which has thus far proved to be the richest of three ledges belonging to the Crater Mine. The rock taken out has paid on an average over \$100 per ton. The ledge being worked evidently connects with what is called the Middle ledge at no very great depth. A new and commodious working shaft is being sunk on the middle ledge, which is intended to be the main working shaft of the mine when completed. The cross-cut which is now being driven northerly from the 160-ft. level, on the engine shaft, is in 20 ft., and will reach the middle ledge in about 10 ft. more. The last rock worked from this mine, and which has just been cleaned up, yielded \$40 per ton.

BELLEVUE.—This mine under the management of Fred Jones has been yielding daily, for the past month, very rich ore from the several shafts. The hand mortar has pounded out over \$2,500, to say nothing of the stores of rich ore in sight in the backs as the shafts are being sunk, and no stopping has been done.

ECLIPSE Co.—They have completed their mill, which has 5 stamps and is run by a burly curdy wheel. The ledge belonging to this Company is 30 inches in width and the rock shows gold, whenever broken, all through it.

GREENE.—The mine continues to richly remunerate the owners. The present shaft is being sunk and is developing a large body of very rich ore.

JULIAN.—This mine is turning out bullion at the rate of \$12 per ton of rock crushed. The mill, which is one of the best in the State, with 20 stamps, crushes 30 tons every 24 hours. The ledge is from 2 to 5 feet in thickness and easily extracted and broken.

COON.—This mine is furnishing rock that pays \$80 per ton at a depth of 20 ft., and increases in richness as the shaft is being sunk.

PLUMAS COUNTY.

TALO.—*Plumas National*, March 1: This Co. of Argentine, have for some time past been put-

ting their mill in order, and started up some 3 week's since. We were shown a day or two ago, something over \$600, the result of 12 day's run of their nine-stamp mill.

ELBOW TUNNEL.—From Mr. Denison we learn that the Elbow Co. are running a large quantity of gravel through their flume, and everything works "to a charm."

GREEN MOUNTAIN.—Some very rich rock is now being taken from this ledge, near Cherokee, and it is thought that the strike will develop a large body of high grade ore.

NEW YORK CO.—Cor. from La Porte: This Co. have struck the highest kind of pay dirt upon some high rock, prospecting from \$1 upwards to the pan—or, as some of the workmen express it, the dirt is lousy with gold.

FOWLER'S DIORITES.—Thomas has the best kind of a prospect, with a tunnel 1,800 ft. in the hill, and owning the largest portion of the claims. He let a contract a few days ago of 100 ft. in solid tunnel for \$14 per foot.

BONDWELL TUNNEL.—This tunnel is still being pushed ahead, being in over 1,100 ft. They are not making so good headway at present, owing to a large quartz ledge running in the tunnel almost parallel with it.

TRINITY COUNTY.

AT WORK.—*Trinity Journal*, March 1: miners throughout the county are at work with a fair supply of water. The storms during the past week have put considerable snow on the mountains and the Spring will probably be an extra one for mining.

Nevada.

ELY DISTRICT.

ALPS.—*Pioche Record*, Feb. 23: The American Flag mill commenced crushing Alps ore last Wednesday. Average pulp assay \$132. The dump is full of rich ore which is being forwarded to the mill daily. The vein is now fully 18 inches in width.

IN PROGRESS. New east and west drifts have been started from the 500-ft. level, and the prospects are good in both directions. The mine was never in better condition than now.

ALADDIN.—Two days since a fine body of quartz was encountered, interspersed with first-class ore. Work is being pushed day and night. Over \$5,000 has already been spent in development.

CHIEF EAST EXTENSION.—Shaft below the 90-ft. level down 110 ft. There is some fine ore on the foot-wall.

MARION.—The shaft is down 285 ft. The ledge is much harder and has some good ore mixed through it, which assays very well.

MONTANA.—The indications have improved wonderfully in the drift for this ledge during the week, and it is almost certain that it will soon be reached.

MAZEPPA.—Work continuing with full forces, and ore breasts all that could be desired, and there is a marked improvement as the development proceeds.

NEWARK.—The main shaft is now down to a depth of 630 ft. and work is being prosecuted with all energy in the shaft and in the south drift.

PHILADELPHIA.—The ore breasts are unchanged. An immense amount of ore is on the dump, and great inconvenience will result if the condition of the roads does not soon improve. Pioche will send out enormous quantities of bullion when sufficient milling facilities are again available.

JOHN PIERCE.—The new shaft is down 325 ft. The rock is harder and has been very hard, but is now coming in softer. A large ledge was cut through the past week, which shows well. It has been located for the company.

PARIAN.—Work has been prosecuted in the Parian with renewed energy. The shaft is now down 84 ft. and a drift has been started north to cut the ledge, left in the foot-wall at the depth of 100 ft.

THE BAY EX.—This mine continues to send up to the surface large amounts of high grade ore daily. Some idea may be formed of the yield of the Raymond & Ely when we state that the local tax on its million product for the last quarter amounts to over \$18,000.

SILVER PEAK.—The rock, during the past week, has been harder than usual, but everything considered, fair progress has been made and is being made. The incline is now down fully 200 ft. Good progress has been made during the week in the tunnel, and the indications are that it has nearly reached the ledge.

STAR OF THE UNION.—We were shown specimens of ore from this promising new ledge, and must say that better looking ore, considering the extent of the vein, we have seldom inspected. The incline is now down nearly 200 ft. and work is pushed ahead with full forces.

ESMERALDA.

Cor. Calistoga Tribune, Feb. 10: There are two quartz mills running, and another one is in course of erection. The mines are principally of silver ore, though there is some gold found in some of them. Among the richest and best developed may be mentioned the Major Thompson and Belle Waddle, the ores from which assays from \$300 to \$1,000 per ton. Besides these there are a great many more that are producing first class ore, and all of them are being developed.

Besides the silver mines there are very extensive borax and salt marshes, which contain millions of dollars worth of these two articles. The borax forms on top of the ground, and is so easily gathered that one man alone, with a shovel, can collect from 3 to 5 tons a day. At present there are only two companies engaged in its manufacture. The Pacific Borax Company own 98 quarter sections of borax land, and are shipping a great deal of borax to San Francisco. Hearse & Co. are making about 4 tons per week of refined borax, which is worth, in San Francisco, 28 cents per pound or \$560 per ton.

REESE RIVER.

OREGON SHAFT.—*Reese River Review*, Feb. 22: This is the deepest shaft in the district and larger quantities of ore are hoisted than from any other works. Seventy-six men are employed here; prospects even better than usual.

BOLTER-HIDE INCLINE.—The cross-cut from the bottom of the incline has been extended 120 ft. at which point a vein of fine ore has been cut.

SOUTH AMERICAN SHAFT.—A cross cut from the 400 ft. level has just cut a vein 12 inches in thickness, but sufficient work has not yet been done in it to develop the vein.

NORTH STAR SHAFT.—There are 16 men at work who have a fine body of ore in the 220-ft. level; we saw a specimen weighing about 50 lbs., which comes from a ledge 18 inches thick; it will mill \$1,500 per ton.

OGDEN INCLINE.—Working a force of 18 men with good ore in the west level.

MOHAWE.—This mine was formerly known as the Saratoga. The prospects in this mine are better than ever. They have just developed an extensive chimney of high grade ore in the west level.

GROVE TUNNEL.—Working 14 men, with good ore throughout the mine.

MORGAN & MUNCEY.—Six men are working here on a fair grade of ore.

JANE.—Four men at work who are at present sinking an incline.

HATFIELD TUNNEL.—There is the same activity displayed here as before, and 12 men are at work, taking out good ore from various parts of the mine.

AUSTIN.—This mine was formerly called the Reese.

Two men are working in the incline at a depth of 125 ft. and taking out some good ore.

S. C. BAKER.—The lessee are taking out very good ore. **PACIFIC MINING Co. (LIMITED).**—There are not over 20 men at work either above or below ground. Sixty tons of ore have been worked the present month in the Manhattan mill, which netted \$8,000 after paying milling charges. There are from 30 to 40 tons of ore in the ore house at present which is supposed to average over \$200 per ton.

SARATOGA.—A pump is being placed in this mine at present; will start up again next week.

BELMONT.

EL DORADO SOUTH CONS. Co.—This Co.'s new mill has already started to its full capacity. The large body of ore in the south works of the El Dorado mine is increasing both in extent and the richness of the ore and lies between two splendid walls; the foot wall is granite and the hanging wall slate. Working this whole mass as it is taken down, it averages \$120 per ton at the mill, but assays as high as \$1,828 have been taken from the screenings of portions of the mass of chlorides.

MONITOR Co.—Still running their fine mill on the high grade Monitor mine, making the lower level northerly through good milling ore. The upper steps look splendid; still drifting back into the hill for a back ledge. Working 70 men. This Co. shipped to-day \$5,100 in bullion, being two days' run.

BELMONT Co.—Still pushing the lower drift, which are continuing to expose good bodies of ore. Taking out good ore from steep above water line.

WASHOE.

ARIZONA & UTAH.—*Gold Hill News*, March 1st: This company is putting up a new boiler house so as to be ready to place in position the new boiler and pump, which are en route.

ARK.—The new building over the shaft is completed. Sinking the shaft is making excellent progress. The tunnel is still driven energetically ahead, the rock in the face working well and good headway being made.

BELCHER.—Daily yield 400 tons. The mine is looking splendidly at all points, and the ore breasts at the 1,000, and 1,100-ft. levels bid fair to hold out for years to come, to say nothing of the immense body now just being opened out at the 1,300 and 1,400 ft. levels. The last mentioned level is but just opened into from the Crown Point, and the ore which is taken out through the Yellow Jacket shaft is of very fine character and high grade. The drift southwest of the 1,200-ft. level to connect with the drift north from the main incline, being pushed ahead as fast as possible.

BALTIMORE CON.—Drift west of the 250 ft. level, now in 342 ft., face in clay and quartz. Shaft down 470 ft. Have commenced cutting out for a new station at that point for a drift to the ledge.

BUCKETE.—Owing to the bad roads the ore hauling has been considerably impeded this week.

BONNY.—The east cross-cut from the 100-ft. level at a depth of 75 ft. from the shaft cut during the week, a body of good ore 10 ft. in width.

CALEDONIA.—The main south drift on the 400-ft. level of the new shaft is continued, cutting during the week some excellent indications of ore.

CHOLLAR-PORTER.—Daily yield 60 tons of ore, the assay value of which is \$32 per ton. The ore breasts are not looking and yielding up to the usual average, although the large tonnage of the daily yield is not attributable to that cause alone. The ore dumps are all full, and it being impossible to get the ore shipped to the mills, it was found necessary to stop the work of a number of men in the mine until the dumps can be cleared.

CHOWN POINT.—The 1,300-ft. level shows improvement in both quantity and quality of the ore being produced, character than in the levels above, and showing an increase of gold, making the bullion worth more than that from the other parts of the mine. It is richest at the south end, next to the Belcher. The drift south at the 1,400-ft. level from the incline, is being driven ahead toward the ore body, and the incline is being sunk at satisfactory rate, considering the hard nature of the rock.

CHOWN POINT RAVINE.—The shaft is cleaned out and repaired to a depth of 200 ft.

EMPIRE.—The main south drift is being energetically driven ahead to connect with the 1,300-ft. level of the Yellow Jacket mine, as soon as possible.

GOULD & CURRY.—Sinking the incline is making good progress, though the rock in the bottom is becoming tough and hard. The main south drift on the 1,600-ft. level to connect with the north drift from the Savage, and the main east drift on the 1,500-ft. level are being driven ahead.

GLOBE.—The raise from the main tunnel is up 35 ft., the whole distance showing good ore.

HALE & MORGAN.—Daily yield, 190 tons of ore from the ore breasts between the 1,300 and 1,400, and 1,400 and 1,500 ft. levels. These ore bodies continue to show a decided improvement in both the looks and the quality of the ore extracted. The main south drift on the 800-ft. level or second station, toward the Chollar, has developed a fine, extensive, and important body of good ore, some 85 ft. east of the old workings of the vein for former years.

IMPERIAL.—The new machinery is being placed in position for operation as fast as it arrives.

JURIST.—Both north and south drift at the 400-ft. level are being driven ahead as usual. The face of the south drift is in very promising-looking quartz and porphyry.

JULIA.—The east drift, 800-ft. level, and west drift, 1,000-ft. level, have made good progress during the past week.

LEE.—The incline is down 90 ft., and has cut into a very large body of high-grade ore, showing gypsum, decomposed quartz and red sulphurets. Assays from this mine have run as high as \$1,800.

NEVADA.—This is one of the old locations on American Flat, and is situated immediately south of the Baldy Mountain Co. and Arizona and Utah. Work was resumed upon it in November last, drifting south from the old adit tunnel, which is 125 ft. in length, along the ledge toward a chimney of ore which crops out quite prominently. The ledge is 22 ft. wide, with a pay streak of ore from 2 to 6 ft. wide, in which the drift is progressing. The drift is now in 110 ft., and below 4 car loads of ore per day is taken out, which is piled up on a dump for milling. It is both silver and gold ore, about half and half of each, silver predominating perhaps a little.

SAVAGE.—Daily yield 100 tons of ore, the assay value of which is \$27 per ton. The main drift south on the 1,600 ft. level made the connection with the south wing of the ledge above on Tuesday last, giving a much needed circulation of pure air. Three cross cuts east to cut the ledge and prospect the level, were immediately commenced at different points along the line of the drift.

STERNA NEVADA.—It has been with extreme difficulty that a sufficient supply of wood could be obtained to keep the mill running during the week.

SUPER HILL.—All the work in the shaft and on the levels is stopped for the present, on account of inability to obtain the necessary supply of wood to keep the pump running and the shaft clear of water.

SCROON.—The rock shows improvement this week, and assays as high as \$90 to the ton.

SETTLE TUNNEL.—Total length, 3,375 ft. The rock works well and good progress is made. Shaft No. 1 is nearly down to the tunnel level.

UNION CON.—The north drift from the main west tunnel is in 150 ft., the face in solid quartz which gives assay of \$12 to \$18 per ton.

VIRGINIA CON.—The main north drift on the 1,157-ft. level from the Gould & Curry shaft is making excellent progress, the entire face of the tunnel in good ore. The body of ore developed by this drift is both extensive and of high grade.

YELLOW JACKET.—Both 1,400 and 1,500-ft. level drifts are progressing as usual; also the cross-cutting at the 1,600-ft. level north.

The First Quartz Mill at Pioche.

Yesterday forenoon, seeing steam rising from the new Floral mill, says the Pioche Record, situate in the northern suburbs of the city, we bent our steps thither, and found fifteen stamps in full operation, with every arrangement made for continuous working. Distant readers will pardon us for considering this event one of transcendent local importance, and giving it more than passing notice, when they are informed that the Floral is the first and only quartz mill at Pioche, all our ores heretofore having been reduced at Bullionville, 10 or 11 miles to the southeast, where wood and water are more abundant.

The Boiler Room.

We first entered the boiler room, and there spent a few moments very profitably. There are two boilers, each fifty inches in interior diameter and 16 feet long. The steam-drum is 30 inches in diameter and nine feet in length. The smoke-stack is 36 inches in diameter and 50 feet high. Live steam pipes and exhaust pipes cross each other at almost every angle, extending from the lower works in all directions. The whole is set in solid stone masonry. From 5 to 6 cords of wood are daily consumed. The boiler room is 30x25 feet in extent, including wood house.

The Engine Room.

Passing from the boilers, we entered the engine room, and there, truly, did we behold, at a glance, so strong a steam mechanism of this highest order to repay us for our half-mile walk through the mud and melting snow. The engines are horizontal with the patent adjustable cut-off attachment, by means of which the power and extent of strokes can be instantaneously regulated while the machinery is in full operation. Wonderful example of the ingenuity and intelligence of man! With its massive steam-chambers, in which is ever confined and ever passing the strength of a hundred stout horses, its gigantic steel arms, tirelessly keeping in perpetual motion hundreds of tons, this mighty motive power operates with the smoothness and regularity of the pocket chronometer. The awkward freight wagon jogging along this road makes more noise. A full detailed description we would feel incompetent to give, had we at our command the space to do so. This fly-wheel is 16 feet in diameter, makes 60 revolutions a minute, and weighs 10,000 pounds. These works, like the boilers, rest on a solid masonry foundation, eight feet deep, which is built up from bed-rock.

Manufacturers.

The steam works of the Floral mill, at Pioche, were turned out by the Risdon Iron and Locomotive Works, corner of Howard and Basal streets, San Francisco; and Pacific Coast artisans need offer no better proof of their ability to cope with manufacturers in other parts of the world than they afford.

Pans and Settlers

There are six combination pans in operation, of highest capacity and constructed from the best models and in the most substantial manner. They are propelled by lighter wheels. And just below them, reached by a short flight of stairs, down a 5-foot breast of masonry, are three settlers, 3 feet in diameter and 3 feet in depth, which are connected in the usual way with the

Retort Room.

Entering the retort room, which is 36x20 feet in extent, we find there every modern facility and appliance for preparing the precious metal ready for coinage. There are three retorts, each of 1,000-pounds capacity with refining works, etc., complete.

The Ore Room

Is supplied with a magnificent drying furnace, 10x31 feet in extent, over which from 20 to 25 tons of ore are easily dried each day, ready for the batteries. But the most important feature of this department, and deserving of special notice, are the excellent dust chambers connected with the batteries and drying furnaces—constructed by Captain Benjamin Evans, the

builder, on an entirely new principle. By means of these the interior of the mill is kept free from flying dust, and almost every particle of the ore is saved. The dust, entering the chambers, ascends a few feet above the roof, where it is arrested and returned below, to be again precipitated into the batteries.

Ore Cars,

Above and below the batteries, nicely adjusted on iron tracks, with turnplate attachments obviate entirely the use of the shovel in removing the ore after pulping.

The Water supply.

A few yards distant is a monster water-tank, which will hold 20,000 gallons, from which water is conveyed through pipes to all parts of the mill. And C. H. Light, the Superintendent of this mill has wisely utilized this inexhaustible supply beyond the regular business wants of the mill, by providing hundreds of feet of hose, extending all through and to the farthest corner of the building, as a precaution against fire. The tank is directly connected, by pipes of sufficient capacity, with the Floral Spring Water Company's works, and, of course, there

The Grizzly Bear (Ursus horribilis).

We introduce our illustration of the grizzly bear; to show, to our readers how marked the contrasts that may pertain to the conditions of a new country, in a very brief period of years. Only twenty years ago, California was known almost entirely as a mining country, with a population of adventurous spirits scattered throughout the length and breadth of the lower Sierras, and oftentimes disputing the right of domain with the native lord of the forests, the Grizzly.

But those early scenes, with all their excitements, dangers and "hairbreadth 'scapes," are now seldom heard of but in the records and history of the past, for now more peaceful pursuits are dominant. Our cut presents us with one of those scenes incident to that in which a trio of miners had for a day turned hunters, and had found game "worthy of their steel," or rather their leaden balls, and whilst one of the

Our Foothill Lands.

Every few weeks we hear of something to strengthen our belief that the foothill lands along the whole length of the Sierra Nevada, adjacent to the placer mining districts of the early days, and the quartz and deep-hill diggings of the present, will eventually become the homes of thousands upon thousands of those who can be content with health, prosperity and moderate gains, in distinction from those who only measure their happiness by the number of broad acres they may possess in the broader valleys or great, lower, arid plains.

We have a letter in hand from Mr. M. F. Gregory, of Jenny Lind, Calaveras county, who speaks favorably of lands in that section, alluviums formed by the Calaveras river, as being finely adapted to the growth of corn, barley, wheat, fruits and vegetables, and gives the yield at 25 cents of wheat and 30 cents of barley per acre. As lands adapted to vineyard culture, the fact has been established, that there are none in the State that can excel those of the foothills, and immigrants would do well to give this vast range of almost unappropriated foothill lands a careful examination before paying double or quadruple prices for the low valley lands, which are no better, for all the purposes of vineyard and general fruit culture.

Just now in the first part of March, go into the markets of San Francisco and on inquiry it will be found that the thousands of boxes of choice, well-kept apples of all the winter varieties known to any country, are almost to a box, Oregon apples; and they are Oregon apples because California does not yet supply her own market with this fruit. Now there are no better lands or climate in Oregon for winter apple production, than are the foothill lands and climates of this State. We speak from a positive knowledge of the fact, and yet there are ten thousand acres of these lands awaiting entry at \$1.25 per acre.

There are localities along the lines of the railroads built or contemplated, through the foothill country, where alter-

nate sections of the finest vineyard, grain and fruit lands are in possession of the railroad incorporators, and from whom an immediate and perfect title can be obtained, at prices ranging from three to ten dollars per acre, depending upon locality, quality of soil and timber; whilst the other sections are still in the hands of the government, subject to entry at established rates.

The Foundation of Our Steam Fleet.

We have shown what we can do in the way of steamship building, in the new steamboat "Eastport," destined for the Coos Bay coal trade. She is of 500 tons and has cost \$150,000. The effects of the trial of this vessel on our coal trade will probably tend in the direction of the reduction of the price of coal in this city. If the "Eastport" is a financial success to her owners, we shall in a couple of years have the entire fleet of sailing coasters replaced by small steamers, and a flourishing ship-building business will as a result spring up in this city. We have on this Coast everything necessary for ship building, and should own all our ships and build them, we, therefore, hail with the building of the "Eastport," as a step, though a small one, in this direction.

Since the beginning of the current harvest year we have dispatched to the United Kingdom a grain fleet of 266 vessels, carrying full cargoes of the finest wheat to the aggregate extent of 400,000 tons.



HUNTERS FIND A GRIZZLY.

is no danger of this supply ever being deficient.

A Blacksmith Shop, As complete as any in this city, is connected with and a part of the mill property.

Aggregate Cost of Mill.

Something over 100,000 feet of lumber was used in the construction of the building, at an average cost of \$75 per 1,000. But as the entire basement is constructed of massive granite walls, the cost of lumber does not bear a great proportion to the entire cost as might be supposed. Elegance, as well as strength and durability, has been considered in the section and completion of the Floral mill, and it is neatly finished and tastefully painted throughout. The aggregate cost is estimated at \$65,000.

Fifteen Stamps Are in Operation, Reducing ore from the Hermes mine; but there is on the ground a vast quantity from the Huhn & Hunt, and other ledges, hauling to the mill continues, and it is probable that no mill in the district will run more regularly than the Floral. Five stamps more, making 20 in all will be put in operation as soon as the necessary material arrives—now on the road from Palisades.

Builder and Management.

Captain Benjamin Evans, assisted by J. C. Clark, was the architect and builder. C. H. Light is General Superintendent; John Collier, amalgamator and general manager, and George W. Coffey, engineer.

We consider the construction of the Floral mill another important guarantee of the permanence and continued growth and prosperity of Pioche.

There is one fact about printers that we have always noticed: They are not over-fond of "pi," but you ought to see how they will "disturb" sweet morsels of mince-pie to their proper "box!"

party finds himself unexpectedly taking an inside view of a Grizzly's face, under circumstances of startling interest, his comrades, at an exceedingly short range, are about to pour in a broadside volley, that if anything saves the half prostrate, hat and gunforsaken miner and hunter, from a bad chawing up, that volley must. And thus we leave him—as is sometimes said—"in the hands of fate," but to our eyes looking more like the paws of a grizzly. The natural history of this grizzly in very few words is this: It inhabits the Rocky Mountains and the mountains to the west of them, to the Pacific ocean. Is of all this bear tribe the most savage and ferocious, and this most to be dreaded for size and strength.

BELCHER AND CROWN POINT.—The improvement in the ore production of the Belcher and Crown Point is apparent in the returns of ore crushed for January and the first two weeks of February, as follows:

	Belcher.			Crown Point.		
	Tons.	Average.	Amount.	Tons.	Average.	Amount.
January...	8,501	\$51.46	\$417,489	15,000	\$41.43	\$621,450
Feb. 14 days..	4,413	50.00	265,580	6,981	50.00	349,050

In the latter part of January the 13th level in the Crown Point was tapped, and since then the ore raised from it gradually increases. The same level in the Belcher has now been entered from the Crown Point and has been carried south 73 feet. A cross-cut into the vein 10 feet shows high grade ore. The average in that level of the Crown Point is over \$150, and the average of the mill product is constantly rising. There are two other mines in which the ore shows in daily increasing strength.

Good Health.

The Dress of Children.

Should our children be dressed in a manner becoming their tender years and their ceaseless activity, or like the dolls and images seen in the senseless puppet-show? As we look at the children in our cities, we are led to believe the latter is the popular manner.

A child is something given to our keeping, for ne to develop in every possible manner to its utmost, not injuring or cramping one of its God-given powers. The first necessities of a child are love, food, and warmth. The two first are more amply supplied than the latter.

How many mothers are there who will dress these tender ones as warmly as they do themselves? A little babe who has never felt a breath of air till perhaps within a few days or weeks past, is considered warmly dressed if fortunate enough to have on a thin flannel shirt with long sleeves, and over this a thin white material for a dress.

The teething babe is often allowed to sit on the floor, which is by several degrees the coldest part of the room, dressed in a manner which would cause us to shiver with cold. Young children require more clothing than adults, yet they seldom get as much. I well remember, and with gratitude, too, the advice of my physician, while tending a sick teething babe. I asked him why my babe was sick so much?

"Because you don't dress it warm enough." I showed him the long-sleeved delicately-textured flannel shirt, the warm skirt, the little merino dress lined throughout, and the home-knit stockings, reaching above the knees. No matter, says the kind old man, "your babe is ailing and teething; he can neither creep nor walk, hence has no warmth from exercise, and, besides, sits on your floor, which is entirely unfit for a strong, well person, because it is so cold." Straightway the flannels were doubled, and under the dress a warm flannel wrapper, and my babe was warm.

Thin white flannel, such as mothers love to use, has not the necessary warmth.

Stockings should be thick, and knit very long, also fastened by elastic to the waists of skirts, so they may not slip down, exposing the bare leg. In winter a single flannel garment about the neck, chest and arms is insufficient.

Mothers of this generation must consider the physical education and training as of first importance, for by our own weakness we know we cannot impart the robust physique we desire our offspring to possess, therefore our lack must be as far as possible, be made up by the careful, judicious training of our children in young and tender years.—*Science of Health.*

DEATH FROM COLD.—Experiments on animals show that they keep themselves alive as long as they are maintained in a state of half congelation, and die whenever their temperature and circulation are so far restored as to permit the blood-globules disorganized by cold, to be diffused throughout the vessels. Death occurs, therefore, whenever these globules are sufficient to produce a considerable disturbance in the system, that is, whenever the frozen part is at all extensive. An animal entirely frozen, and consequently containing in its congealed blood no globule but those unfit for life, is dead, without possibility of resurrection. Thawing it only restores a soft, flaccid, discolored body, with opaque eyes. If freezing only attacks a limb, it becomes gangrenous, and is destroyed. Pauchet deduced from these examinations judicious, practical conclusions. If it is true that, in cases of partial freezing, the death of the individual is due to the disorganized globules re-entering the circulation and corrupting the blood, it is plain that, the more sudden the invasion of these globules is, the more rapidly death will supervene. It follows that, by resisting this invasion, by means of ligatures, or extremely slow thawing, we might succeed in preventing the poisoning. The diseased globules which, pouring in a flood into the heart and lungs, would imperil life by the sudden alteration of the blood, will apparently disturb it merely in an unimportant way, if they are dropped into the blood by slow degrees.

REMEDY FOR HEADACHE.—Put a handful of salt into a quart of water, add one ounce of spirits of hartshorn and half an ounce of camphorated spirit of wine. Put them quickly into a bottle, and cork tightly to prevent the escape of the spirits. Soak a piece of cloth with the mixture, and apply it to the head; wet the cloth afresh as soon as it gets heated.

Croup.

Croup is one of the most dreaded complaints to which children are liable. It is an inflammation of that delicate membrane which, continued from the mouth, lines the whole inner surface of the larynx and windpipe, and finally of the bronchial tubes, or air-passages.

Both from the importance of its situation and the rapidity with which it runs its course, croup is one of the most dreaded and fatal affections in the range of juvenile diseases.

The symptoms begin with restlessness, which in a few hours is followed by wheezing in the throat and hoarseness, most heard during sleep, while a short, dry cough soon after succeeds, attended with a tightness and constriction in the throat, indicated by the child frequently raising its hand to the part as if to remove some obstruction. The difficulty of breathing becomes rapidly more distressing, and the face assumes an aspect of great anxiety; the veins in the neck become swollen and knotted, or varicose, and the voice, every time the child speaks or coughs, has a sharp metallic ring, which soon settles in a steady sound, like the crow or croupy noise made by fowls when caught and held in the hand—that character, in fact, which has given to the disease the popular name which it bears. The cough, at first dry, is after a time attended by a thick, ropy expectoration, which clinging like glue to the fauces, and extremely difficult to remove, causes the child great suffering to expel, the patient appearing half suffocated in its abortive attempts to void the adhering whitish phlegm. With these symptoms come on thirst, heat, and considerable fever; the pulse is quick and vibrating, while the efforts of the child to obtain air causes it to arch the neck back in a manner most distressing to witness, till the anxiety of countenance and difficulty of inspiration increasing, the little patient expires about the third day, strangled from the interruption of air to the lungs.

The paroxysms of this disease usually come on in the evening, and become intensified about midnight, the patient seeming free and better during the day.

All efforts should be bent to induce the re-absorption of the false membrane, loosen it from its hold of the windpipe, and cause it to be expelled. Warm bathing, or sprinkling with warm water may be resorted to, and moderate vomiting produced until the services of a physician can be secured, a matter which should never be neglected, unless one has had much experience in such cases.

HOW WE GO TO SLEEP.—If the phenomena of sleep were not so common, they would be regarded as among the most marvellous of all our experiments. In sound sleep, all voluntary motion is suspended. The muscles relax, beginning with those which move the body, the large muscles of the legs, then the muscles which move the arms, then the muscles which keep the head erect, then those which support the lower jaw, and, last of all, those which keep the trunk in an upright position. Of the senses, that of sight is the first one to surrender. The muscles which draw up the upper eyelids lose their power, and the eyes close, but the retina loses its sensitiveness to the light, even when the lids remain open. The sense of taste disappears next, then the sense of smell, then that of hearing, and, last of all, the sense of touch, which disappears only in the most profound slumber. When a person is to be roused from slumber, touch is the first sense to respond, then hearing, then smell, then taste as the last, the sluggish of all the senses. Sound sleep, and a plenty of it, is indispensable to health. It is the great restorer of the waste which takes place during our waking and our working hours, and is indispensable to long or happy life.

DEATHS FROM THE BITES OF ANIMALS, ETC., IN 1870.—By the Register General's thirty-fifth report, for 1870, just published, we learn that during that year, in England and Wales, hydrophobia was fatal in thirty-two distinctly ascertained cases, and glanders in four. These two are the only diseases known to be caused to man by his two most intimate domestic animals. Two children, however, died from the bite of dogs—not hydrophobic; one from the bite of a cat, and another from a cat sleeping on its face and so producing suffocation. The bite of a rat and of a ferret were fatal in one instance respectively, and one person, an adult, was stung to death by bees. Singularly enough, the victims in the case of all the bites—dog, cat, rat, and ferret,—were male children. Two hundred and fifty males, and twenty-two females, perished by means of "horses and other animals," exclusive of the large number of accidents connected with railways, tramways, mines, etc., and of the 954 males and 182 females returned as killed from "horse conveyances." The total number of violent deaths in the year was 16,593.—*Land and Water.*

A SINGULAR DISEASE.—Cases of a singular and fatal disease have occurred at Logan, Cache county, Utah. The patient is attacked by a pain in the left knee; the leg below the knee, down to the toes, becomes much swollen, hardened and red, the pain then abates, the swelling recommences above the knee, and extends up to the body, when inflammation seizes the bowels and the patient soon dies. Three cases of this disease have occurred, and the medical man, who has had forty years' practice, says he has never known anything like it before.

A SUBSTITUTE FOR VACCINATION.—A theory, which is not altogether a new one, has recently been revived publicly by Dr. D. S. Woodworth, of Fort Wayne, one of the oldest and most eminent physicians of Indiana. In a letter to the *American Practitioner*, he says that for thirty-four years he has held to the plan of pustulation by tartar-emetic as fully as good a preventive of smallpox as perfect vaccination. He adds that the fact is familiar to physicians that there is an almost exact resemblance between tartar-emetic pustules and vaccine, not only at their full development, but during the successive stages. He asks the question, why this artificial pustulation may not be "just as good a preventive as vaccination since the same process has been gone through with, and the same molecular changes?" and suggests that experiments be made in hospitals to prove this theory.

INBROWING NAILS.—A correspondent to the *British Medical Journal*, recommends the following treatment for this annoying and sometimes obstinate trouble: About twenty years ago, I applied a bit of compressed sponge to afford temporary relief, and was delighted to find that it effected a radical cure. I make the sponge as solid as leather, by wetting and then winding string very tightly round it, and drying it thoroughly. Of this I cut a small pyramidal piece, less than a grain of rice. This I insert beneath the nail, and secure it by strips of adhesive plaster, applied longitudinally, to avoid compression. The sponge soon becomes moist and swollen, keeping the nail from the irritated flesh. Any granulations should previously be destroyed with strong nitric acid. I have adopted this plan upon many occasions, and have never found it to fail.

USEFUL INFORMATION.

First Introduction of Coaches.

Coaches came into general use in England earlier than on the continent of Europe. Queen Elizabeth's state carriage was the first vehicle which was designated by that name in the island. In 1583 the Queen rode from the Somerset House to Paul's Cross, to return thanks after the destruction of the Spanish Armada, in a coach presented to her by Henry, Earl of Arundel. It is described as "a chariot throne, drawn by two white horses." The royal fashion found many imitators; and although the coaches of that period must have been clumsy and uncomfortable, they multiplied so rapidly that Dekker, satirizing the follies of his day, complains that "the wife of every citizen must be jolted" now—a very expressive phrase, since the coaches were made without springs, and the roads were of the most primitive kind. But long after the introduction of coaches it was considered effeminate and disgraceful for men to use them.

Queen Elizabeth always preferred to make her journeys on horseback, and even in old age and sickness took reluctantly to horseback. "In Sir Philip Sidney's time," says Aubrey, "so famous for men-at-arms, it was then held to be as great a disgrace for a young gentleman to be seen riding in the street in a coach as it would now for such a one to be seen in the street in a petticoat and waistcoat; so much has the fashions of the time altered." Like most other improvements, coaches were vehemently attacked, on the ground that they promoted effeminate luxury.

Taylor, the water poet, declares "that house-keeping never decayed till coaches came into England; and much later, in 1673, a Mr. John Cresset wrote a pamphlet urging the abolition of the stage coaches between London and the interior. Among other grave reasons for their suppression, he urged that "such stage coaches make gentlemen come to London on every small occasion, which otherwise they would not do but upon urgent necessity; nay, the convenience of the passage makes their wives often come up, who, rather than come such long journeys upon horseback, would stay at home. Then, when they come to town, they must presently be in the mode, get fine clothes, go to plays and treats, and by these means get such a habit of idleness and love of pleasure as to make them uneasy ever after."

CONVERTING PAPER INTO LEATHER.—It is said that an establishment in Pittsburgh, Pa., has a process for treating paper which makes it much harder and tougher than leather, and so elastic as to resist almost any blow without perceptible compression, while it can be worked very easily and cheaply. A French inventor has a similar process, and is now in this country making arrangements for an exhaustive trial of the material for ship armor. It has been approved of by several naval officers who have seen it, and who express an opinion that most valuable service may be rendered by it.

IMPROVEMENT IN CASTOR OIL.—An Italian chemist named Croppi, a resident of Forli, has discovered a process by which castor oil is rendered tasteless and odorless, while its efficacy and emetic quality, which makes this best of cathartics repugnant to so many, is not in the least lessened. Sig. Croppi's invention will prove a great blessing to consumers of castor oil, and its introduction into American medical practice will undoubtedly follow.

Air Guns.

Probably the most perfect air guns in the world are those made in London for the use of British poachers. As they make no smoke, and consequently no smell, they are not so easily detected as firearms when used in game preserves. It is a mistake, however, to suppose that they make no noise. When charged, so as to produce the effects above described, the report is quite sharp—fully as sharp as that produced by gunpowder. When lightly charged, the report is of course diminished; but the force with which the bullet is projected is also proportionately lessened, and so is the recoil. As a weapon for secret assassination, therefore, the air gun does not possess much advantage over a good rifle-barrel.

Few persons are, however, aware of the slight charge of powder or air that is necessary to produce a fatal wound at short distances. Experience teaches us that a bullet that will go through a half-inch board will kill a man if it strikes him in a vital and not too well protected part. Now a bullet can be projected from a rifle with a force sufficient to pierce such a board at twelve paces, by means of a charge of powder not greater than that which will lie on a silver three-cent piece; and provided the charge be ignited quietly, as by a pill luck, the noise of the explosion will not attract the attention of persons who are sixty yards distant. The small pistols in common use make very little noise, except when discharged in confined places; and yet, if the ball should strike a vital part, death may be caused instantaneously by a wound from them. The only advantages possessed by the air gun are its perfect cleanliness and the fact that the parts are not liable to be corroded and rusted. It never requires cleaning; but the labor of charging the condenser may be fairly offset against the labor involved in cleaning ordinary fire-arms after they have been used.—*Industrial Monthly.*

A NEGLECTED SOURCE OF FOOD.—THE AFRICAN EARTH-NUT.—Dr. Muter, in the pages of *The Food Journal*, calls attention to what he terms a neglected source of food. Some time ago while investigating color by means of the microscope, he discovered an ingredient employed by way of adulteration to which he could give no name. Subsequently, he had a sample of a substance offered at the Mark Lane Exchange as an article of food for cattle, forwarded to him for analysis. It now becomes necessary to deal with the matter seriously, and so further microscopic investigation led to the discovery that the mysterious ingredient was simply the flour of the African pea or earth-nut. Dr. Muter declares, however, that the bean of this peanut is an excellent substance, which, instead of being used only as food for cattle, or by some adulterators more enlightened than their neighbors, should be everywhere recognized as a marketable article of human diet.

THE TRUE VITALITY OF LIFE.—The mere lapse of years is not life. To eat and drink and sleep; to be exposed to the darkness and the light; to pace round in the mill of habit and turn thought into an implement of trade—this is not life. In all but a poor fraction of the consciousness of humanity is awakened; and the sanctities will eluminate which will make it worth while to be. Knowledge, truth, love, beauty, goodness, faith, alone can give vitality to the mechanism of existence. The laugh of mirth that vibrates through the heart; the tears that freshen the dry wastes within; the music that brings childhood back; the prayer that calls the future near; the doubt that makes us meditate; the death that startles us with mystery; the hardship that forces us to struggle; the anxiety that ends in trust—are the nourishment of our natural being.

Facts for Business Men.

My success is owing to my liberality in advertising.—Bonner.

Advertising has furnished me with a competence.—Amos Lawrence.

I advertised my productions and made money.—Nicholas Longworth.

Constant and persistent advertising is a sure prelude to wealth.—Stephen Girard.

He who invests one dollar in business should invest one dollar in advertising that business.—A. T. Stewart.

A NOVEL RAT TRAP.—A resident of Newburyport, Mass., whose house is infested with rats, has a novel method of capturing them. On returning at night he sets his traps, which consists of a number of lines, to which are attached tomcod hooks covered with bits of meat. These are suspended a few inches above the floor and connected by a cross line, to which is attached a line running to his bedside, which rings a small bell when a rat is caught. The rats go for the bait, the bell rings and the watcher enters with a club and exterminates them.

ADVICE TO WORKING MEN.—Above all, to be a successful mechanic, you must be a mathematician. Unless you can conquer the mathematics of this trade, you will always have to drudge at the hardest work done. With a thorough practical knowledge of the work and the principles underlying it, you will soon rise above the lathe and file. Study and work together.

MINING SCIENTIFIC PRESS.

B. EWER.....SENIOR EDITOR

DEWEY & CO., Publishers.

A. T. DEWEY, GEO. H. STRONG,
W. B. EWER, JNO. L. BOONT.

Office, No. 338 Montgomery St., S. E. Corner of California St., diagonally across from Wells, Fargo & Co.'s.

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San Francisco:

Saturday Morning, March 8, 1873.

Legal Tender Rates.—S. F., Thurs., Mar. 6.—buying 87½; selling 88¼.

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MINING STOCK MARKET.—Table of Daily Sales and Prices and Comparative Prices for the Week; Notices of Assessments; Meetings and Dividends; Review of Stock Market for the Week, 148.

MINING SUMMARY from various counties in California and Nevada, 149.

MISCELLANEOUS.—Resources of Utah—Some of the Principal Mines—Continued; The Metallurgy of Gold and Silver; African Gold Mines; American vs. British Mines; Plumbago Mines; Pacific Ports; Plumbago Mines; Quicksilver in Napa and Vallejo, 146. The first Quartz Mill at Pioche, 150. Mammoth Copper Mine; Bullion Product of the United States; Silver Peak Mining Company; Mount Diablo Coal Mines; Rich Ore; New Atlantic Telegraph Cable, 154. New Incorporations; Meetings and Elections, 156.

A HANDSOME GIFT.—The entire property of the Toland Medical College, including building, grounds, philosophical apparatus, anatomical preparations and models, library, etc., valued at \$75,000, has been presented by the Trustees of the Toland Medical College to the University of California. The institution will accordingly, be hereafter under the control of the Board of Regents of the University. The only condition is that it is to be devoted as heretofore to medical education. The gift is due mainly to the munificence of Dr. H. H. Toland.

SPECIMENS.—We have received some very handsome specimens of argenteiferous galena from the Benton mine Inyo county from Mr. Thos. E. Jones. Some of the ore runs as high as \$1,500 per ton. This class of ore is shipped to Swansea for reduction. Some pieces of rock are heartily stained with copper with peculiarly formed crystals. The ledges are four or five feet wide and a pay streak of 18 inches in thickness.

REDWOOD CASES.—Experiments have been tried with the view of substituting the Redwood for Oak, in the making of wine casks, and it seemed for a time as though it might prove a success; but now there comes up a different view of the subject, for it is said by an experienced wine-grower that the wood will absorb a gallon a week; moreover, the casks at the end of the second year become so wet they are difficult to handle; also they leak badly.

VIENNA EXPOSITION.—It is stated that the United States will be much better represented at the Vienna Exposition than was at first expected. The government vessel which was to have sailed this week has a full cargo.

The net gold product of the San Francisco Assaying and Refining works for February was 48,292 ounces, valued at \$938,780.

Torpedomania.

"As everybody has his favorite stimulant, upon which he falls back when sated with variety, or unwell, so the American has his favorite weapon. It was once a howie-knife, then a rifle, then a Rodman, but at present it is a torpedo. "Give us torpedoes and we are invincible, is the popular cry."—*Broad Arrow*.

The wave of somewhat ridiculous, yet withal universal, panic agitated by the startling result of the Franco-Prussian war has, it seems, produced a slight ripple of excitement even here. Though lessened, naturally, by distance, it has registered itself in the Ordinance gage, and its fluctuations are perceptible in the columns of the press. Now, while we enjoyed heartily England's periodic scare, we cannot afford to disregard our own more rational (because less wild and more sustained) desire for adequate protection. To return to the tidal wave simile: England, where the disturbance first manifested itself, has already settled down to its usual calm and will remain so till the next convulsion, while we are still rocking on the less violent surges.

Personally, we have no especial prejudice against torpedoes, though we might perhaps be forgiven, if the word conjured up disagreeable reminiscences of unfortunate conjunctions of Fourth-of-July, silk-hats, sawdust, small pebbles and small boys. But the amount of interest shown in accounts of newly invented torpedoes, with the confidence they, as a means of national defense, seem to inspire, call for a brief summary of the present status of the much discussed "torpedo question."

Torpedoes are broadly divided into two classes, known as "fixed" and "movable." By the former term we understand those constructed on the *ne tange* me principles of the hedge-hog; by the latter, such as are made with a view to active offensive operations. Fixed torpedoes were successfully used by Russia in the Crimea, and again by the South in our civil war. Their utility, while necessarily limited, is so well appreciated in military circles that they will be always looked upon as an important auxiliary arm. It is well to keep their exact position and value in mind. So much ingenuity has been expended in devising modes of placing and exploding them that they may be considered to have reached the limit of perfectibility.

It is with the movable class, however, that we have especially to deal. Ever since Fulton's first conception of a submarine boat it has been implicitly believed that if a way of moving at will under water, or even partially submerged, could only be discovered, the existing power of navies would be destroyed and a complete revolution in the art of war effected. A great deal of money has been spent, and many lives lost by perilous experiments in this direction. To recall one most touching instance: a submarine torpedo-boat built by the rebels to attack the blockading fleet off Charleston, after having been twice sunk and raised, went to the bottom for the last time in command of a brave lieutenant, who had been the sole survivor of a previous forlorn hope. The newest torpedoes, as the Ericsson, the Lay and the British fish and rocket types, being self-propelling, are directed from a vessel or the shore, thus lessening the danger to their users.

The commission appointed by government to examine the comparative merits of these new "internals" is empowered to expend a large sum in costly experiments; and, in fact, the torpedo item is a most serious one in the ordinance expenses. This commission has distinguished itself, thus far, principally by its warm recommendation of the Lay torpedo, about which we have heard so much and learned so little. It is utterly impossible to give an explanation which shall do it justice in anything short of a War Department report. Its main features are the use of carbonic acid in a condensed state as the motive, and electricity (our mechanical panacea) as the controlling power. It certainly deserves credit as the triumph of intricacy, (as any one who has attempted to follow the published descriptions will sorrowfully testify), and consequent costliness. Suffice it to say that in two trials at Newport it failed in its professed ability to be directed accurately. Nor do we see any marked improvement in any of the other models. At least so the partisans of the respective torpedoes seem to think, for they agree with charming unanimity in denouncing each other's pets. And yet this is only one-half the promise that the advocates of movable torpedoes stand pledged to. If they do not succeed here, of course it

makes little difference how or when their machines explode; provided the latter, with their usual sagacity and discrimination, do not molest us. Nothing less than an unerring aim, high speed, certainty of ignition at this precise spot and time, safety to the manipulators and, above all, simplicity, is required. As yet this point has not been reached. It probably will not till the millennium—and then we won't want such expensive fire-works—as the combination of requisites, each in itself a *sine qua non*, is well-nigh overpowering. Let patentees work out their own experiments and foot their own bills. To be sure it is said that our national economy is becoming parsimony. But why not work to the best advantage? With the present shame of our gallant Navy should we become monomaniacs on the subject of what the *Broad Arrow* (from which our text), an impartial witness, calls "an arm so ticklish to manage, and so untried in real warfare, either on the offensive or the defensive?"

Well, the inventors may console themselves with our heartiest wishes for their success; for when the Gallipagos, defended by a joint committee consisting of a French chemist, a Yankee mechanic and the nameless individual ss Chairmen, defies the allied fleets of the world, we may proclaim the advent of the era of peace.

Academy of Sciences.

The regular meeting of the California Academy of Sciences was held on Monday evening last; President Davidson in the chair. John H. Carmany and Robert Robinson were elected resident members and W. N. Lockington a corresponding member.

Donations.

Several additions to the library were presented and Dr. Kellogg presented and read descriptions of a number of new plants peculiar to this coast, as follows:

Hedeoma pumila: A new species of pennyroyal, found at Webb's Landing, on the San Joaquin river.

Nema racemosa: Found at Cisco, in the Sierra Nevada, near the railroad, and in the Coast mountains.

Calycadenia plunioja: Sent by an unknown friend from Stockton, without note or comment. The crowning glory of a species of fragrant fall plants, with yellow blossoms.

Calia Californica: From Mendocino county. *Macrorhynchus Harfordii*: Found on R. E. C. Stern's place at Petshuma; a species of fall dandelion.

Etholera quadrivalvis, hirsuta: Woolly-seeded variety of the evening primrose, having purple spotted flowers, and bark yielding a strong fibre.

Mr. Lick's Gift.

President Davidson announced to the Academy that the recent donation of a valuable building site by James Lick had been appropriately acknowledged by the Board of Trustees, and the following minute of proceedings had been presented personally to Mr. Lick, accompanied by a letter from the president:

At a special meeting of the Trustees of the California Academy of Sciences, held at their rooms February 18th, A. D. 1873, to take action upon the deed of property made by James Lick of the county of Santa Clara, the following expression of the sentiments of the Academy was adopted.

The unexpected and unsolicited gift of our fellow member, James Lick, to the California Academy of Sciences, is so far beyond our sanguine expectations that we cannot express to him in adequate words our heartfelt thanks for this maturely considered and magnificent act.

It emulates the richest bequests of Europe and the United States for assisting the pursuit of knowledge, and places every devotee of science throughout the world, and for all time, under the deepest obligations to the donor.

The California Academy of Sciences accepts the deed with its conditions and every member will strive to prove by his unswerving efforts to fulfill them, that the desire of James Lick "to promote the diffusion of science" is deeply appreciated. Having struggled unaided, but hopefully, for twenty years in the cause of science on this coast, the members of the Academy are inspired with renewed faith in their efforts, and believe there is an awakened thirst for scientific research and knowledge, which will prompt our citizens to emulate the noble example of James Lick.

The trustees in a body will wait upon our benefactor to present these sentiments, and to offer the sincere thanks of the Academy for this exhibition of his munificent liberality, with the assurance of the personal efforts of every member to faithfully endeavor to carry out his wishes in the spirit in which they are made.

George Davidson, President; John Hewston, Jr., Vice-President; Charles G. Yale, Secretary, Elisha Brooks, Treasurer; Robert E. C. Stearns, Oliver Eldridge, Thos. P. Madden, David D. Colton.

The President then read an address on the subject of Mr. Lick's gift, saying that the Academy needed \$200,000 to build the structure

and maintain it, and entertains no doubt of the society being able to raise the money.

Alfalfa.

Dr. Gibbons showed a curious specimen of alfalfa, exhibiting its adaptability to different circumstances of growth. It was the remains of a growth of alfalfa on Rincon Hill, at the Second street cut, in this city. The soil had been gradually washed away, leaving the root exposed, but it continued to grow. The extremity of the root was in a claysy soil. The root was more than an inch in diameter. It showed a remarkable tenacity of life in the plant.

Dr. Kellogg said that he had seen places where the alfalfa root was exposed for eight feet by a bank, showing how it obtained its moisture in dry seasons, by the roots being so long. Alfalfa, when sown on the floating islands of the San Joaquin river, instead of running roots down as it does under ordinary circumstances, branches out from three to six inches, making very good feed. It is important to know that, although it suits dry soil admirably, it also adapts itself to wet soil, and in that case does not run down to any depth.

Judge Hastings remarked that the alfalfa, when on lands subject to overflow, say for a week at a time, dies, and has to be sown every year. Upon little exposure to water it is killed.

Sponges.

Dr. Hewston referred to a parasite in an ordinary "abalone" from Pigeon Point, which presented also a specimen of the official sponges. If we really have this sponge on the Coast it will be a great thing for California.

Professor Davidson said the commercial value of the San Diego sponges was about \$10 a pound.

Gravels of Placer County.

Professor Davidson, in referring to a paper read at a previous meeting by Dr. Willey, on the gravels of Placer County (published in the MINING AND SCIENTIFIC PRESS of Feb. 15th) said that the writer thought that it was not this water that caused the gravel. Professor Davidson thought that the overflow of tufaceous lava and the water too were the cause.

Dr. Willey said he meant it was not by water alone, but spoke of the immense deposits and could not see that the ancient river system was so clearly marked out as was supposed. He was at a loss to tell how the cement could be formed by the mere action of rivers. Mr. Hanks had examined the cement and found that it contained the elements of granite. A reason of its formation might be found in glacial action. Another point he noticed was the total disappearance of everything but quartz in that part of the country. The cement may possibly represent the pulverized granites. Many forces had been at work.

Professor Davidson thought that if the cement should prove to be decomposed quartz we could account for it by glacial action, but how can we account for the great abundance of rounded pebbles. Professor Whitney had commenced at the highest point of the American River, where gravel was formed and when accurately measured and put on paper it became evident that the new river was 1,500 feet below the old one when the gravels were formed. The same difference of elevation was apparent in the Yuba River.

Another Gift.

Judge S. C. Hastings, of this city, stated that he was ready to join with any twenty or any ten other gentlemen, and make up the sum of \$200,000 to erect the building on the lot given by Mr. Lick. He expressed his willingness to give \$20,000.

Miscellaneous Proceedings.

A paper, by F. E. Durant, was read, on the nature of liquids contained in mineral substances, their properties being determined by spectrum analysis.

An interesting paper, founded on the observations of John Applegate, an old resident of the San Joaquin Valley, was read, on a curious deposit noted in that locality in the fall of the year, in some respects resembling the manna described in Scripture and by Josephus, and known as honey dew. No conclusion as to its origin has yet been attained. It is collected by the honey-bees and deposited in cells, and a specimen in that form was presented to the Academy.

Mr. Lorquin gave a description of a species of California vulture, recently captured by him. It differs from those described in the Railroad Reports and other works, having down upon its neck, instead of the neck being bare. The specimen measured nine feet ten inches, from tip to tip.

CONGRESSIONAL MATTERS.—By the adjournment of Congress a number of bills of interest to the Pacific Coast failed to be acted upon and died with the session. Among them were the bills to incorporate the Utah Railroad and Mining Company and the Colorado River Railroad Company; to provide for the entry of lands as agricultural unless specifically shown to be mineral; granting the right of way for the Mare Island submarine tunnel; for subsidizing the Australian Steamship Line; for granting lands to the Northern Coast, San Diego and San Bernardino and Wilmington and Wickenburg Railroad Companies; to aid the Pioche and Utah Central Railroad; to encourage telegraph communication with Asia; to aid in the construction of the Sutro Tunnel; and also the Goat Island Bill.

Steam vs. Sail--Cheap Coal in San Francisco.

The new steamer "Eastport," which was launched recently, made her trial trip on the 22d ult. for the purpose of testing her steaming and sailing qualities, and as far as could be judged was very successful. She was built by Captain Olof Read, and engineered by the Risdon Iron and Locomotive Works for Messrs. Lawrence Pool, Donald Beadle, George Fritch and R. D. Chandler, for the purpose of carrying coal from Coos Bay to San Francisco, and is designed to test the advantages of freighting by steam instead of the usual way by sailing vessels. If successful, the owners hope to place coal in the San Francisco market, with equal regularity and condition, and give consumers the same advantages now obtained by those using Mount Diablo coal.

In order to compete successfully with sailing vessels it was necessary to combine large carrying capacity, every convenience to handle the freight, moderate speed, with the smallest consumption of fuel, comfortable but limited passenger accommodations, and yet to be of such dimensions and draught as to enable them to navigate the waters to the coal mines at the head of Coos Bay. Of these various qualifications the rate of speed and consumption of fuel were the only ones tested on the trial trip. The former exceeds the expectations of the owners, and marked by the patent log $9\frac{1}{4}$ miles per hour; the recorded consumption of fuel being ten tons per day, or $3\frac{1}{2}$ pounds of Coos Bay coal per indicated horse power, a result never before attained on those waters.

The dimensions of the "Eastport" are as follows: Length, 160 feet; width of beam, $32\frac{1}{2}$ feet; depth of hold, $11\frac{1}{2}$ feet; 500 tons burden; she is planked with four-inch plank, and constructed in the strongest manner. The engine is direct acting, surface condensing and is exceedingly well made. The engine, made from the most modern of English plans, is remarkably strong and compact; indeed, to one accustomed to the engines used in the San Francisco waters, with the labyrinth of pipes, valves, levers, etc., it is a perfect model of simplicity. The cylinder measures 34 inches in diameter, with a 30-inch stroke. The propeller is 9 feet in diameter, 14 feet pitch and runs with 35 to 40 pounds of steam, following 11-30th of the stroke and averages 395 indicated horse-power, making 74 revolutions per minute. During the trial trip, when it is not usual to have everything in first-rate order, she steamed altogether (stoppages allowed for) 9 hours and indicated an average of 350 horse-power, upon a consumption of 4 tons of Coos Bay Coal.

This result released the builders from that part of their contract which guaranteed a certain number of horse-power upon a specific consumption of fuel, and satisfied the owners that they had the cheapest running boat on the Western waters.

The Risdon Iron and Locomotive Works offered to build a ship and engine here guaranteeing a certain speed, consumption of fuel, draft of water and specified amount of tonnage, thereby fixing the rate of carrying a ton of freight one mile, which is the usual form of contract with the first-class builders, who are thus enabled by combining and designing the hull and engines to give the most satisfactory results. The machinery was designed and erected under the superintendence of George Dickey, who is a practical shipbuilder and engineer, and has for many years had the management of an extensive ship yard and engine works in Scotland, and who is now settled in San Francisco, waiting patiently for that much-hoped-for event "the revival of American shipbuilding," and hopes yet to see California take a foremost rank and see her ships in every port where a dollar can be made.

The "Eastport" has gone on her first trip to Coos Bay and we will lay before our readers a farther account of this new enterprise upon her return. It is to be hoped that it will be entirely successful and that the owners can afford to deliver coal here at a profit to themselves at much cheaper rates than is now done. Nothing that we know of would be of more advantage to our manufacturing interests than cheap fuel.

SAN FRANCISCO MINT.--The coinage at the San Francisco Mint for February was as follows: Double Eagles, \$1,290,000; silver dollars, \$700; half dollars, \$2,500; half dimes, \$16,200; total, \$1,219,000.

Mare Island Navy Yard.

Soon after the influx of gold-seekers had demonstrated the fact that California was to become a populous and important State in the American Union, the Government, with its usual characteristic foresight, began to look round for a site for a Navy Yard. Mare Island, lying between Napa River and San Pablo Bay, a short distance below the Straits of Carquinez, seemed to present the most suitable point for such a location, and Commodore Farragut was instructed in 1854, to take possession of the same. The Island comprises an area of some 600 acres, exclusive of water surface, upon which has been erected immense storerooms, smitheries, foundries, carpenter and machine



MARE ISLAND NAVY YARD, VALLEJO, CAL.

shops, timber sheds, quarters for officers and men, and an extensive naval hospital--the whole constructed of brick, on the most approved plans, and in the most substantial manner. Stone quays, sectional dry-docks, basins, and railways, magazines, etc., have also been built, and all with a view to the utmost attainable efficiency, and on a scale commensurate

every night. Indeed, four times a day, the channel between it and the mainland swarms with little boats carrying the laborers to and fro, and presenting quite an interesting and busy appearance.

On approaching the Island, the large, dry-dock, hospital, officers' dwellings, shops, etc., together with the numerous Government vessels, lying "in ordinary," gracefully in the river, presents a pleasing spectacle. The upper view represents the machine shops and yard, with two monitors lying in the river.

Everything is as neat as abundance of time and labor, with the characteristic nautical cleanliness can make it. The cannon are laid in rows, and the halls piled with mathematical nicety, suggesting that the Government is

fully alive to the truth of that trite expression: "In time of peace prepare for war."

The lower cut shows a few of the vessels lying at the docks. The one in the foreground is the old "Independence," of immense size, like all the old-fashioned line-of-battle ships. The dismantled one is the "Mohican," which is shortly to be rebuilt. The "Resaca" lies in



VESSELS AT THE NAVY YARD.

with the growing and future wants of the Pacific Coast.

Anchorages in the stream is good, and vessels of the largest class can approach quite near the shore. There is a ferry, that runs every hour between the Island and Vallejo, directly opposite which it is located. When strangers land on the Island they are received by a guard, no one being permitted to traverse the Island without a pass.

The origin of the name of the Island is said by some to have arisen from the circumstance that a ship-wrecked mare, belonging to Gen. Vallejo, once reached the Island in safety after much peril. Others claim that it took its name from having formerly been employed as a breeding ground.

From five to eighteen hundred workmen are employed on the Island, all of whom live at Vallejo, as no workmen are allowed to domicile on the Island, which must be entirely cleared

the background. She was recently sold by the Government, and will shortly be placed on Goodall and Nelson's line. The large derrick for taking boilers and heavy machinery out of the vessel is known as, "Bishop's boom derrick." The buildings shown are the workshops of the Bureau of Construction.

A NARROW GAUGE ROAD is being built by a local company from San Luis Obispo to the landing, on the coast, a distance of nine miles. The landing is an open roadstead, or little better, when passengers have to be taken ashore in small boats and hoisted out, and it is quite difficult to load or unload small vessels. If the harbor were improved so that it would be safe, the railroad would be of much more benefit than it is likely to be. But perhaps the residents think if the road is built first, the harbor will be remedied afterward. The country back of San Luis Obispo is used mainly for sheep and cattle ranges, farms being comparatively few and far between.

Wood-Working Machines.

The importance of the wood-working interest gives it a rank among the industries of the country that should entitle it to much more consideration in our technical literature than it has heretofore received. The endless variety of the machinery which is now required to perform the work in wood that was formerly done by hand, has created a want for some such extensive and practical hand-book, as has long been supplied to almost every other branch of the industrial arts; but with the exception of a few imperfect articles in our Encyclopedias, a few papers read before scientific societies, and published only in connection with their voluminous proceedings, and now and then some limited notices of different machines scattered through the pages of our technical periodicals, until the appearance of the book now before us, we have had nothing to meet this want.

The work before us has been prepared by J. Richards, M. E., and consists, in addition to a very full treatise on the construction and operation of wood-working machinery, a history of the origin and progress of such machinery and contains numerous engravings and texts, showing the modern practice and construction employed by prominent engineers in England, France and America.

The plan adopted by the author, as expressed in his preface, is to notice in a general way the leading operations of wood conversion, with the construction and operation of machines in modern use, introducing such rules and treating of such laws as have been fixed by practice and experience, and have come within the knowledge of the writer within an extended experience in designing and constructing both standard and special machines for wood-work. The British *Trade Journal*, in speaking of the work says:--It is a full and intelligent account from the pen of a practical engineer, of the construction and operation of these useful implements, which are every day becoming more of necessity where there is a strain on the ordinary powers of production. The rules here introduced prove the width and depth of the author's experience, both in design and construction.

The illustrations form an important feature of the work, and are as copious as they are well executed. It contains information that cannot fail to be appreciated by all who are especially interested in the construction and operation of wood-working machinery. The author is evidently a practical man, and has his subject well in hand. A valuable extract from this work on "The Band Saw and Band Sawing," will be found on another page.

The work is sold by subscription only. Orders and communications can be addressed to L. H. Berry, 117 North 22d St., Philadelphia. Price, post free, \$6, in cloth, or \$6.75, in morocco.

What to do With Our Boys.

The mechanics of this city, upon whom the onus of the necessity of this question has been charged in certain quarters, have not only denied the soft impeachment, but have come forward as a body, through their representatives, and taken the first practical steps towards a solution of the query. The Mechanics' State Council, after carefully considering the question in its various bearings, have appointed a "Mechanics' Deliberative Assembly," made up of representative men from the various leading industries in the city, who have been asked to come together and devise the best plans for establishing and carrying on labor schools, to which "Our Boys" may have access, and where they may have the opportunity to learn trades, under suitable masters, and thereby employ their time to some present pecuniary advantage as well as fitting themselves for future usefulness.

This movement is most excellent, and opportune, and one which we trust will eventuate in fully solving the difficult problem propounded. The principle of labor schools is not new, but has been carried to a great degree of perfection by the Germans, whose system, with some modifications, might undoubtedly be successfully applied in this city. In order to reach this end successfully it is necessary that the enterprise should be initiated and carried on by men of practical and sound judgment. It is to be hoped that the deliberative assembly, which has been called to consider and devise a plan will so enter upon their work as to bring forth a most perfect scheme for the mental and physical education of those youth of San Francisco, who may be in need of such an opportunity.

Australian Steam Lines.

After waiting for a couple of years to see a permanent steamship service inaugurated between San Francisco and the principal ports by means of a subsidy voted by Congress, the prospect seems farther off than ever. After killing off many schemes, the last one, the Webb subsidy bill has gone the way of all Congressional innocents, and there seems to be but slight hopes of its resuscitation. As a consequence it is now rumored that the regular line is about to be discontinued, and that we are to revert to the old system of sailing vessels, taking from two to four months on the voyage. This would be a calamity of no slight magnitude to our commerce, and it is one which we hope may by all means be averted. Short as has been the existence of the Australian steam lines, it has effected a wonderful change in our commercial relations with Australia. To it may mainly be ascribed the fact that in one year our imports thence have increased seven hundred per cent.; the value alone of the coal imported last year being equal to two-thirds of that of the whole imports of 1871. Previous to the inauguration of steam communication, we were as far removed from Australia, commercially and otherwise, as we are to-day from Eastern Africa, since then the people on both sides of the broad Pacific have begun to know each other's wants and resources, hence, the trade that has sprung up. It is true that a very large proportion of the imports have been introduced in sailing vessels, but it is the regular uninterrupted postal communication which has given birth to the trade so carried on. This trade, if properly encouraged, would continue to develop with the same rapidity, and a counter export trade would spring up still as our merchants began to know the wants of the Australians. The Pacific Coast and the great colonies of the south ought to occupy the same relation to each other that Europe does to the great Republic of the West. There is no doubt that the flow of population to Australia will by and by set in from the Pacific Coast and from Europe—people will prefer a short sea and land route, to three or five months of ocean life round the Cape of Good Hope or Cape Horn. Indications already point that way. An Australian postal convention has decided in favor of carrying mails by way of San Francisco, and population will in time follow the same way. This recommendation and the hope of a subsidy from Australia is the only chance that the present steam line has of being continued. This is not as it should be. If our merchants or capitalists were sufficiently awake to their own interests, they could and ought to organize companies for building steamers, and carrying on Australian trade, as powerful as those being formed for Samana Bay or Navigator Island trade purposes. If our advice was heeded in this matter, our business men would no longer wait for this aid of the Congressional Jupiter, but would arise and put their own shoulders to the wheel.

Leather Belting.

The manufacture of this useful article has become an important branch in our productive interests; therefore, dependent on the East for our supplies in that line, it is no small matter of importance and general economy that our steadily growing manufacturing interests can be supplied with this indispensable auxiliary at their own door.

This state of affairs is attributable, no doubt, to the rapid progress which California has made of late in the leather business generally. Our boundless supplies of the finest and most astringent oak bark, together with our extensive hide market, have attracted to us some of the most skillful tanners of the East and of the old world.

A visit to the factory of H. N. Cook, at 415 Market street, where the belting business is extensively carried on, showed to us a great many interesting things. We noted in process of construction a double belt thirty inches wide for the California Sugar Refinery and two very large double belts for the Pacific Rolling Mills. They are made entirely of center strips from the largest hides, of which these three alone consume over two hundred. The process of stretching, cementing, pressing and rivetting so thoroughly welds and amalgamates the various strips together that they seem in effect to be as though nature had grown them in one continuous strip of the required length.

Mr. Cook informs us that he makes every spring about 100,000 ft. of small sizes for the agricultural trade, for drapers of trowsers and bedders.

We are glad to note the rise and growth of these useful and abiding sources of wealth in our community, and predict that the day is not far distant when our outward bound trains and vessels will be heavier laden than the inward.

MAMMOTH COPPER MINE.—It is stated in a London paper that the Mammoth Copperopolis of Utah have received telegrams from their Superintendent that they are taking out eight tons of ore a day. As this ore is said to yield a profit of \$10 per ton, it would give about \$240,000 a year from the copper, while it is estimated that \$58,000 per annum will be derived from the silver ore as soon as the mill is in operation.

Industries of the Golden City.

Manufacture of Maccaroni, Vermicelli, Etc., in San Francisco.

Considering that we are not a community of Italians, the value of this industry supported by these apparently minor articles of consumption is surprising. Not less than three large and well appointed factories are supported. Of these the largest is that of

Brignardello, Machiavello, & Co.,

Sansone street, who commenced business at their present location in 1856, with five men and one horse power. Since then they have prospered so that they now occupy one of the largest factories in the city, employ eighteen men, and are obliged to have an engine of fifty-horse power to supply the motive power to their machinery. They manufacture all kinds of Maccaroni, Vermicelli and fancy pastes, each of which has an Italian name of its own, to give which would rather embarrass our readers than otherwise. The

Wheat Used

Is of a peculiar kind, hard and glutinous, of a bright yellow color, grown originally in Chili, but most of which is now raised for this firm by farmers in Santa Clara and Livermore Valley, to whom they distribute seed. It is sold at two cents per pound. The seed used being Chilean, has to be continually renewed by importation, for in California, the wheat gradually changes its character, and becomes White Wheat. To

Manufacture This

Into Maccaroni, etc., it is first ground into Farina in a mill on the premises, and the middlings, bran, etc., is separated. The Farina resembles more than anything else, corn meal. It is kneaded in a large trough by a revolving stone, composed of marble, and is thence transferred to a screw press furnished at the bottom with moveable plates, in which boles are punched of the shapes and size desired, and through which the dough is driven. The tubular form is given by a wire fixed in the center of the hole. This done the process of manufacture is complete. For fancy pastes, this firm use a horizontal press, which possesses a cutter that clips off the paste of any length desirable.

Messrs. Tenhorey & Co.,

Mission street, are one of the oldest manufacturers in the city, employing sometimes half a dozen men, and manufacturing largely every description of goods in this line.

Ravenna, Ghirardelli & Co., Battery street, also employ six men, and manufacture proportionately. The

Value of the Manufacture

Yearly is about \$77,000, of which Brignardello, Machiavello, & Co., make \$46,750 worth, and Messrs. Tenhorey & Co. and Ravenna, Ghirardelli & Co. about \$15,000 worth. This represents about 41,000 boxes. There are two principle grades of Maccaroni, which are sold respectively at 12½ and 8 cents per pound. Of all the Maccaroni made in the city, about one-fifth is exported to the Sandwich Islands, Mexico, China and Japan. The total capital invested in the business in San Francisco is \$66,000, and the number of bands employed, 30.

Bullion Product of the United States.

Although the reports of the United States mint, showing the amount of silver and gold deposited for coinage, by no means represent the production of the precious metals of the country, yet the following figures exhibiting the total value deposited in the Philadelphia Mint and branches from 1793 to June 1872, will not prove uninteresting:—

	GOLD.	SILVER.	TOTAL.
California.....	\$642,965,026 09	\$56,423 03	\$643,121,449 12
Montana.....	30,448,255 24	1,638 57	30,825,503 81
Colorado.....	29,438,420 96	1,114,513 43	31,452,934 39
Idaho.....	17,411,523 81	231,891 53	17,643,415 34
North Carolina.....	9,865,527 97	44,110 95	9,909,638 92
Oregon.....	11,544,979 43	1,873 74	11,556,853 17
Georgia.....	7,232,346 96	403 63	7,232,750 59
Virginia.....	1,422,155 79	1,634 18	1,423,789 97
South Carolina.....	1,375,121 92	1,379 12	1,376,501 04
Nevada.....	1,010,250 47	8,539,565 04	9,549,815 51
Alabama.....	215,750 66	215,750 66	431,501 32
Arizona.....	215,750 66	215,750 66	431,501 32
New Mexico.....	223,021 29	223,021 29	446,042 58
Utah.....	146,147 18	261,204 71	407,351 89
Texas.....	31,829 69	81,523 63	113,353 32
Washington T.....	67,745 38	67,745 38	135,490 76
Dakota.....	5,760 00	5,760 00	11,520 00
Nebraska.....	24,381 57	200,976 50	225,358 07
Vermon.....	5,611 97	5,611 97	11,223 94
Other sources.....	85,226,512 42	2,751 15	85,229,263 57
Pat. from sil.....	4,690,492 30	4,690,492 30	9,380,984 60
Lake Super.....	1,062,510 81	1,062,510 81	2,125,021 62
N. Mex. and son.....	51,653 31	51,653 31	103,306 62
Silks.....	397 61	397 61	795 22
Wyoming T.....	138,878 12	86 48	138,964 60
Myoming.....	108 09	108 09	216 18
Ch. mass.....	1,009 02	467 00	1,476 02
Pine b. res.....	5,238,490 02	5,238,490 02	10,476,980 04
Part. from gold.....	5,841,721 97	5,841,721 97	11,683,443 94
Total.....	\$836,205,463 50	\$2,065,499 24	\$838,270,962 74

That the foregoing figures convey but an extremely imperfect idea of the quantity and value of the bullion product of the United States, is evident from the fact that the exports of treasure from San Francisco alone, from 1848 to 1868 inclusive, amounted to no less than \$864,495,446, or more than the entire quantity embraced in the mint reports for a period of nearly eighty years. And even the statement of exports above mentioned, from San Francisco, does not include the bullion carried out of the port by passengers, of which no account is given. According to the report of Prof. William P. Blake, one of the commissioners to the Paris Exposition, the approximate total production of the Pacific coast alone, from 1848 to 1868, was, in round numbers, \$961,000,000.

San Jose Woolen Mills.

One of our new manufacturing institutions fast growing into notice and popular favor, is the San José Woolen mills at San José. It was built under the supervision of Judge R. F. Peckham in 1869-70 as a six-set mill, with twenty-four broad Crompton looms and twenty-one hundred spindles.

Its capital stock was originally \$100,000, which before starting was increased to \$200,000.

The Company commenced with three sets of cards in 1870, and ran them until April, 1872, when the extraordinary advance in the price of wools, rendered it prudent for them to suspend operations for a time. Up to that date, they were making shirtings of an excellent quality and cassimeres of a medium coarse grade, noted more for their great wearing properties than for desirability of styles. The mill again started in August last, and since that time has been working at its full capacity, employing 85 hands, using about 30,000 pounds of our best northern wools per month, and manufacturing about \$20,000 worth of blankets, cassimeres, doekings, tweeds, and waterproofs, plain, fancy, and bonecomb flannel. It is under the superintendence of Mr. Arby McDonald, late of the Pioneer Woolen Mills, in this city.

The goods of the San José mills have been improved to such an extent as to excite surprise and admiration from all who see them. Their blankets are unsurpassed in beauty, durability, and weight, and their cassimeres are fast taking the place of English and other foreign goods in this market.

Many of their lighter goods find ready appreciation in Chicago, as is evidenced by the orders we have been shown from that place, and we are informed that they command very satisfactory prices, showing that California can be come an exporter of woolen manufactures, when men who understand the business have taken hold of it.

This company have their depot at 521 Market street, San Francisco, where the above goods may be seen, together with manufactures of underwear, overshirts and pantaloons of every description. This depot is under the management of that popular salesman, John R. Mason, long known to the merchants of our city and of the coast generally.

Silver Peak Mining Company.

A complaint has been filed in the Nineteenth District Court by L. L. Robinson, Henry Malthey, J. P. Kelley, M. T. Tarpey, H. L. Thornton, C. E. Hoffman, C. D. Fitzhugh and D. L. Thomas, against the Silver Peak Mining Company, W. H. Sears, Ira G. Hoyt, Wm. Clive, Samuel McCurdy and George A. Treadwell, which alleges that the above named mine is situated in the Pioche District. That out of the capital stock of 30,000 shares plaintiffs hold 4,500 shares. That at a special meeting of the Trustees of said mine, held December 2, 1872, there were present only J. D. Fry, Sears and Martin—Robinson and Cline being absent—an assessment of 50 cents per share on the capital stock was levied; and that a large number of shares were advertised for sale as delinquent for said assessment. That said assessment was made to pay about \$19,000 for crushing rock in the Condon mill, owned by the defendants. Cline, who was Superintendent of the mill, caused to be sent about 200 tons of low grade rock from the mine to be crushed, at a cost of \$6,557. That on September 26, 1872, Fry, Sears & Cline, Trustees, resolved to issue six company notes, secured by a mortgage in favor of M. W. Fox and Jerry Sullivan, to settle the title to the mine. That the notes and mortgages were executed and delivered to Fox and Sullivan. It is alleged that the demand of Fox and Sullivan was an individual indebtedness of Sears and Cline, and not of the Company. That on January 3, 1873, Fry, Sears and Cline, as Trustees, passed a resolution to pay four of said notes amounting to \$8,000, out of moneys collected for account of said assessment. That on January 31st, Cline presented a claim against the Company for \$4,500, money advanced which was illegally paid, although no vouchers were presented. That on January 31st, the Trustees ordered paid \$6,557 to the Condon mill for crushing rock. It is alleged that said claims are fraudulent, and that the votes of Sears and Cline, interested in said claims, were necessary to order the same paid, and that the Silver Peak Mining Company is insolvent, and unable to pay its debts. Wherefore plaintiffs pray that said assessment be adjudged void; that the proceedings ordering payment for ore crushed by the Condon mill be declared void; that Cline and Sears pay the claim of Fox and Sullivan; that the company be enjoined from paying any of said claims, or the defendants from enforcing their claims. A temporary injunction was granted by Judge Wheeler.

The Raymond & Ely thirty-stamp mill, at Bullionville, changed from a dry to a wet crusher, is said to be working finely.

THIRTY-TWO trains passed over the Virginia and Truckee railroad between Virginia and Carson on the 27th ult.

Mount Diablo Coal Mines.

A correspondent of the Oakland Home Journal, writing from Nortonville, gives the following concerning the local mines at that place:

The cold having driven me to cover, I have bethought me, among other delinquencies, to make good the ones on the correspondence I promised you. Few of your readers are probably aware of the

Extent of the Coal Mining Operations

Carried on at this and other points on Mount Diablo, where, according to Indian tradition, his satanic majesty was wont to hold high carnival. In the present article I will confine myself to the operations at this point, and afterwards walk you over the divide to Somerville, another mining camp two miles distant, but situated on the same coal measures. Coal was originally discovered here about

The Close of 1859,

The original locators being Wm. Colman, David Lewis and Kelson, who took up what was known as the Cumberland claim, on the upper or Clark vein. Shortly afterward Noah Norton, by running a tunnel still further, discovered and located the lower or

Black Diamond Vein

Underlying the Clark vein about 400 feet, passing through an intermediate smaller vein about one foot in thickness. The Clark or upper vein, being about three feet, and the Black Diamond or lower vein about four feet in thickness—all dipping at an angle of twenty-five to thirty degrees, nearly due north, and lying along the northern slope of the mountain.

Erastus Madison afterwards located for Noah Norton another claim on the different veins known as the

Norton Claim,

And situate on southeast quarter of section 15. Various changes were made in the ownership of these different claims, till in 1861 they were incorporated, work regularly commenced and coal shipped to San Francisco market, being first

Hauled by Teams

To New York Landing on the San Joaquin river, distant about six and one-third miles from the mine, and thence by schooners to the city. The mines were purchased by the present Black Diamond Company in 1865 or 1866 and re-incorporated with a nominal capital of \$5,000,000, since which the working facilities have been greatly extended and the products vastly increased, till at the present time the yield is from eight to ten thousand tons per month; for most of which there is steady demand for steam purposes.

From 300 to 350 Men

Are continually engaged in the mines and about fifty on the railroad, or in shops on the upper deck, or about 400 in all. There is pretty steady employment for all, and others in search of employment can generally find it here. So if you find any in want of work, send them along in this direction. Miners are paid from \$1 to \$1.25 per yard for cutting coal, and can average from \$3.50 to \$4 per day, some earning much more. Coal buckers, and common laborers are paid \$2.50 per day. Drivers and timbermen \$3, engineers from \$80 to \$120 per month, and blacksmiths \$100. The company is disbursing about \$30,000 per month for labor, besides large amounts for lumber, machinery and supplies in San Francisco for use here.

RICH ORE.—We are informed that more gold is now being found in the Crown Point than ever before. It is thought that the ore body below the 1300-foot level will run as high or higher in gold than does the Belcher. A lump of ore, weighing about ten pounds, was taken out on the 1300 foot level night before last, which was literally spangled with free gold. The specimen would have assayed at the rate of from \$15,000 to \$20,000 per ton. There is not of course any large body of such ore, but finding such specimens is a good indication that in going down the ore will prove unusually rich in gold. They are now drifting on the 1400-foot level for the purpose of opening out on the vein at that depth. When this shall have been done we may expect to hear of some wonderfully rich ore being found.—*Virg. Enterprise.*

THE IODINE PROCESS for the extraction of the precious metals from sulphurets is in successful practical operation near Liverpool. The sulphurets are ground to a fine powder, and gently ignited with common salt. The mass, when cool, is treated with dilute hydrochloric acid; iodide of potassium is then added to the clear liquid. The precipitate, when dried, contains about six per cent. of silver and gold.

NEW ATLANTIC TELEGRAPH CABLE.—The Great Eastern has now on board 2,567 miles of cable; and the telegraph fleet, consisting of four steamers—the Great Eastern, Hibernia, Edinburg and La Plata—with the new cable on board, which is to be laid between England Halifax and New York, will sail the last week in May. It is expected that the cable will be in working order before the 1st of July.

The 952,055 gross tons of iron ore produced in 1872 in the Lake Superior iron district are valued at \$5,712,330.

THERE were 5,000 tons more of foreign made pig iron imported into New York last year than in 1871.

GOOD WORDS

—FOR THE—

PAIN-KILLER.

We can confidently recommend the Pain-Killer.—[Toronto Baptist.]

It is the most effectual remedy we know of for Aches, Pains, fresh wounds, &c.—[St. John's News, P. Q.]

We advise that every family should have so effectual and speedy a Pain-Killer.—[Amherst N. S. Gazette.]

Our own experience is that a bottle of Pain-Killer is the best Physician a traveler can have.—[Hamilton Spectator.]

For both internal and external application have found it of great value.—[Chris. Era.]

A medicine no family should be without.—[Montreal Transcript.]

Could hardly keep house without it.—[Ed. Voice.]

Should be kept in every house, in readiness for sudden attacks of sickness.—[Chris. Press.]

No article ever obtained such unbounded popularity.—[Salem Observer.]

One of the most reliable specifics of the age.—[Old North State.]

Its power is wonderful and unequalled in relieving the most severe pain.—[Burlington Sentinel.]

An indispensable article in the medicine chest.—[N. Y. Examiner.]

It will recommend itself to all who use it.—[Georgia Enterprise.]

Is extensively used and sought after as a really useful medicine.—[Journal, St. John, N. B.]

No medicine has acquired such a reputation; it has real merit.—[Newport Daily News.]

One of the most useful medicines; have used it and dispensed it for the past twenty years.—[Rev. Wm. Ward, Assam.]

The most valuable medicine now in use.—[Tenn. Organ.]

It is really a valuable medicine, and used by many physicians.—[Boston Traveller.]

We always keep it where we can put our hands on it in the dark, if need be.—[Rev. C. Hubbard, Burnab.]

One of the few articles that are just what they pretend to be.—[Brunswick Telegraph.]

In my mountain travels no medicine is of so universal application as Pain-Killer.—[Rev. M. H. Birby, Burnab.]

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The Great Labor Saver of the Household.

ECONOMY, CONVENIENCE AND SAFETY COMBINED.

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Steak broiled in seven minutes! Baked Beans in thirty minutes! The fire extinguished in a moment! And the house unbaked! It has no rival in all kinds of Cooking and Flat Iron Heating, and combines Economy, Convenience, Neatness, Safety and Durability! The Ladies Welcome it; a little Child can operate it, and

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CYANI OF POTASSIUM,

Which I can sell upon better terms than any other dealer on the Pacific Coast.

I make three grades or qualities to suit the requirements of different consumers.

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For rapidly pulverizing and amalgamating ores, they have no equal. No effort has been, or will be spared to have them constructed in the most perfect manner and of the great number now in operation, not one has ever required repairs. The constant and increasing demand for them is sufficient evidence of their merits.

They are constructed so as to apply steam directly into the pulp, or with steam bottoms, as desired.

This Amalgamator Operates as Follows:

The pan being filled, the motion of the miller forces the pulp to the center, where it is drawn down through the aperture and between the grinding surfaces.—Thence it is thrown to the periphery into the quicksilver. The curved plates again draw it to the center, where it passes down, and to the circumference as before. Thus it is constantly passing a regular flow between the grinding surfaces and into the quicksilver, until the ore is reduced to an impalpable powder, and the metal amalgamated.

Sellers made on the same principle excel all others. They bring the pulp so constantly and perfectly in contact with quicksilver, that the particles are rapidly and completely absorbed.

Mill-men are invited to examine these pans and sellers for themselves, at the office, 229 Fremont Street, San Francisco

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RICHARDSON & Co. have been for thirty years established in Swansea as Agents for the preparation, Sampling, Assaying, and Sale of Copper, Silver, Gold, Lead, Zinc, and all other Ores and Metals, for which they have extensive Warehouses and Wharves under cover, 1,800 feet of Quay Frontage within the Floating Dock, and the most complete Machinery and Appliances. They are also prepared to make advances against Ores in anticipation of realization, and to guarantee all payments when required.

17v24-1y

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The success of this most delicious and unequalled Condiment having caused certain dealers to apply the name of "Worcestershire Sauce" to their own inferior compounds, the public is hereby informed that the only way to secure the genuine is to ask for LEA & PERRINS' SAUCE, and see that their names are upon the wrapper, labels, stopper and bottle.

Some of the foreign markets having been supplied with a spurious Worcestershire sauce, upon the wrapper and labels of which the names of Lea and Perrins have been forged, L. and P. give notice that they have furnished their correspondents with power of attorney to take instant proceedings against manufacturers and vendors of such, or any other imitations by which their right may be infringed. Ask for LEA & PERRINS' Sauce, and see name on wrapper, label, bottle and stopper.

Wholesale and for export by the Proprietors, Worcester: Croxson & Blackwell, London, &c., &c., and by Grocers and Oilmen universally.

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The first and only Manufactory on the Pacific Coast. MEERSCHAUM MOUNTAIN WITH SILVER. Meerscham Pipes Boiled and Repaired. Amher Month-pieces Fitted,

Mansfield Gold Mining Company--Principal place of business, San Francisco, California. Location of works, Kelsey Mining District, El Dorado County, California.

Notice is hereby given, that at a meeting of the Board of Directors, held on the 15th day of February, 1873, an assessment (No. 1) of two and one-half cents per share was levied upon the capital stock of the corporation, payable immediately in United States gold and silver coin, to the Secretary, at the office of the company, room 14, 331 Kearny street.

Any stock upon which this assessment shall remain unpaid on the 25th day of March, 1873, will be delinquent, and advertised for sale at public auction, and unless payment is made before, will be sold on Monday, the 18th day of April, 1873, to pay the delinquent assessment, together with costs of advertising and expenses of sale.

WM. SMALL, Secretary. mrl

Office--Room 14, 331 Kearny street.

Noonday Silver Mining Company--Location of works, White Pine District, Nevada.

Notice--There are delinquent upon the following described stock, on account of assessment (No. 2) levied on the 15th day of January, 1873, the several amounts set opposite the names of the respective shareholders as follows:

Name.	No. Certificate.	No. Shares.	Amount.
Allen, Alex.	1023	20	\$ 4.00
Barlow, W. H. Trustee	394	50	10.00
Barlow, W. H. Trustee	729	50	10.00
Berge, G. H. Trustee	683	20	4.00
Child & Jones, Trustee	689	100	20.00
Cousens, O. A. Trustee	948	100	20.00
Cope, J. W. Trustee	576	10	2.00
Cribbing, J. Trustee	485	10	2.00
Cripp, O. W. Trustee	877	2	.40
Crittcher, A. B. Trustee	947	100	20.00
Cobbins, W. Trustee	959	10	2.00
Cobbins, W. Trustee	1031	40	8.00
Durbin, P. Trustee	918	100	20.00
Drexler, L. P. & Co. (all Trustee)	1018	20	4.00
Dunphy, B. Trustee	1031	100	20.00
Farasani, B. Trustee	79	100	20.00
Hill, A. E. (all) Trustee	410	5	1.00
Hill, A. E. Trustee	229	50	10.00
Hill, A. E. Trustee	413	50	10.00
Hill, A. E. (all) Trustee	335	6	1.20
Hill, A. E. Trustee	408	40	8.00
Hunt, O. H. Trustee	944	200	40.00
Hunter, M. M. & A. Trustee	954	40	8.00
Hall, N. Trustee	1012	100	20.00
Howard & Loomis, Trustee	1015	50	10.00
Hoffman, August, Trustee	1031	50	10.00
Hoffman, August, Trustee	1032	250	50.00
Hoberg, I. Trustee	1014	30	6.00
Hoy, R. C. (all) Trustee	227	5	1.00
Kerr, R. Trustee	816	100	20.00
Kibbe, L. C. Trustee	825	100	20.00
Ladington, B. Y. Trustee	102	100	20.00
Lewenberg, S. Trustee	103	60	12.00
Lewenberg, S. Trustee	740	40	8.00
Lynn, A. J. Trustee	964	50	10.00
Lincoln & Howard, Trustee	1026	50	10.00
McDonald & Whitney, Trustee	617	100	20.00
McDonald & Whitney, Trustee	901	100	20.00
Martin, M. S. Trustee	514	100	20.00
Martin, M. S. Trustee	774	100	20.00
Meyers, A. Trustee	948	116	23.20
McDonald, M. J. Trustee	876	73	14.60
McDonald, M. J. Trustee	881	200	40.00
McDonald, M. J. Trustee	889	20	4.00
McDonald, M. J. Trustee	890	100	20.00
McDonald, M. J. Trustee	891	100	20.00
McDonald, M. J. Trustee	892	100	20.00
McDonald, M. J. Trustee	893	100	20.00
McDonald, M. J. Trustee	894	100	20.00
McDonald, M. J. Trustee	895	100	20.00
McDonald, M. J. Trustee	896	100	20.00
McDonald, M. J. Trustee	897	100	20.00
McDonald, M. J. Trustee	898	100	20.00
McDonald, M. J. Trustee	899	100	20.00
McDonald, M. J. Trustee	900	100	20.00
McDonald, M. J. Trustee	901	100	20.00
McDonald, M. J. Trustee	902	100	20.00
McDonald, M. J. Trustee	903	100	20.00
McDonald, M. J. Trustee	904	100	20.00
McDonald, M. J. Trustee	905	100	20.00
McDonald, M. J. Trustee	906	100	20.00
McDonald, M. J. Trustee	907	100	20.00
McDonald, M. J. Trustee	908	100	20.00
McDonald, M. J. Trustee	909	100	20.00
McDonald, M. J. Trustee	910	100	20.00
McDonald, M. J. Trustee	911	100	20.00
McDonald, M. J. Trustee	912	100	20.00
McDonald, M. J. Trustee	913	100	20.00
McDonald, M. J. Trustee	914	100	20.00
McDonald, M. J. Trustee	915	100	20.00
McDonald, M. J. Trustee	916	100	20.00
McDonald, M. J. Trustee	917	100	20.00
McDonald, M. J. Trustee	918	100	20.00
McDonald, M. J. Trustee	919	100	20.00
McDonald, M. J. Trustee	920	100	20.00
McDonald, M. J. Trustee	921	100	20.00
McDonald, M. J. Trustee	922	100	20.00
McDonald, M. J. Trustee	923	100	20.00
McDonald, M. J. Trustee	924	100	20.00
McDonald, M. J. Trustee	925	100	20.00
McDonald, M. J. Trustee	926	100	20.00
McDonald, M. J. Trustee	927	100	20.00
McDonald, M. J. Trustee	928	100	20.00
McDonald, M. J. Trustee	929	100	20.00
McDonald, M. J. Trustee	930	100	20.00
McDonald, M. J. Trustee	931	100	20.00
McDonald, M. J. Trustee	932	100	20.00
McDonald, M. J. Trustee	933	100	20.00
McDonald, M. J. Trustee	934	100	20.00
McDonald, M. J. Trustee	935	100	20.00
McDonald, M. J. Trustee	936	100	20.00
McDonald, M. J. Trustee	937	100	20.00
McDonald, M. J. Trustee	938	100	20.00
McDonald, M. J. Trustee	939	100	20.00
McDonald, M. J. Trustee	940	100	20.00
McDonald, M. J. Trustee	941	100	20.00
McDonald, M. J. Trustee	942	100	20.00
McDonald, M. J. Trustee	943	100	20.00
McDonald, M. J. Trustee	944	100	20.00
McDonald, M. J. Trustee	945	100	20.00
McDonald, M. J. Trustee	946	100	20.00
McDonald, M. J. Trustee	947	100	20.00
McDonald, M. J. Trustee	948	100	20.00
McDonald, M. J. Trustee	949	100	20.00
McDonald, M. J. Trustee	950	100	20.00
McDonald, M. J. Trustee	951	100	20.00
McDonald, M. J. Trustee	952	100	20.00
McDonald, M. J. Trustee	953	100	20.00
McDonald, M. J. Trustee	954	100	20.00
McDonald, M. J. Trustee	955	100	20.00
McDonald, M. J. Trustee	956	100	20.00
McDonald, M. J. Trustee	957	100	20.00
McDonald, M. J. Trustee	958	100	20.00
McDonald, M. J. Trustee	959	100	20.00
McDonald, M. J. Trustee	960	100	20.00
McDonald, M. J. Trustee	961	100	20.00
McDonald, M. J. Trustee	962	100	20.00
McDonald, M. J. Trustee	963	100	20.00
McDonald, M. J. Trustee	964	100	20.00
McDonald, M. J. Trustee	965	100	20.00
McDonald, M. J. Trustee	966	100	20.00
McDonald, M. J. Trustee	967	100	20.00
McDonald, M. J. Trustee	968	100	20.00
McDonald, M. J. Trustee	969	100	20.00
McDonald, M. J. Trustee	970	100	20.00
McDonald, M. J. Trustee	971	100	20.00
McDonald, M. J. Trustee	972	100	20.00
McDonald, M. J. Trustee	973	100	20.00
McDonald, M. J. Trustee	974	100	20.00
McDonald, M. J. Trustee	975	100	20.00
McDonald, M. J. Trustee	976	100	20.00
McDonald, M. J. Trustee	977	100	20.00
McDonald, M. J. Trustee	978	100	20.00
McDonald, M. J. Trustee	979	100	20.00
McDonald, M. J. Trustee	980	100	20.00
McDonald, M. J. Trustee	981	100	20.00
McDonald, M. J. Trustee	982	100	20.00
McDonald, M. J. Trustee	983	100	20.00
McDonald, M. J. Trustee	984	100	20.00
McDonald, M. J. Trustee	985	100	20.00
McDonald, M. J. Trustee	986	100	20.00
McDonald, M. J. Trustee	987	100	20.00
McDonald, M. J. Trustee	988	100	20.00
McDonald, M. J. Trustee	989	100	20.00
McDonald, M. J. Trustee	990	100	20.00
McDonald, M. J. Trustee	991	100	20.00
McDonald, M. J. Trustee	992	100	20.00
McDonald, M. J. Trustee	993	100	20.00
McDonald, M. J. Trustee	994	100	20.00
McDonald, M. J. Trustee	995	100	20.00
McDonald, M. J. Trustee	996	100	20.00
McDonald, M. J. Trustee	997	100	20.00
McDonald, M. J. Trustee	998	100	20.00
McDonald, M. J. Trustee	999	100	20.00
McDonald, M. J. Trustee	1000	100	20.00

And in accordance with law, and an order of the Board of Directors, made on the 14th day of January, 1873, so many shares of each parcel of such stock as may be necessary will be sold at public auction, at the office of the company, room 14, 331 Kearny street, on Monday, the 18th day of April, 1873, to pay the delinquent assessment, together with costs of advertising and expenses of sale.

JOSEPH MAGUIRE, Secy. mrl

Office, Room No. 25, Hayward's Building, 419 California street, San Francisco, California.

Scorpion Silver Mining Company--Location of works, Virginia City, Storey County, Nevada.

Notice is hereby given, that at a meeting of the Directors of said Company, held on the 6th day of February, 1873, an assessment of fifty cents per share was levied upon the capital stock of the corporation, payable immediately in United States gold and silver coin, to the Secretary, at the office of the company, room 22, San Francisco, California.

Any stock upon which said assessment shall remain unpaid on the 12th day of March, 1873, will be delinquent, and advertised for sale at public auction, and unless payment is made before, will be sold on Saturday, the 29th day of April, 1873, to pay the delinquent assessment, together with costs of advertising and expenses of sale.

By order of the Directors. WM. H. MARTIN, Secretary.

Office, 323 Kearny street, Room 22, San Francisco, California. f8-31

Stanford Silver Mining Company--Location of works: Sierra District, Humboldt County, State of Nevada.

Notice--There are delinquent upon the following described stock, on account of assessment (No. 1) levied on the 3d day of January, 1873, the several amounts set opposite the names of the respective shareholders, as follows:

Name.	No. Certificate.	No. Shares.	Amount.
Bowen, F. W. Trustee	88	1000	\$100.00
Bowen, F. W. Trustee	59	1000	100.00
Bowen, F. W. Trustee	70	1000	100.00
Bowen, F. W. Trustee	71	1000	100.00
Bowen, F. W. Trustee	72	500	50.00
Bowen, F. W. Trustee	73	100	10.00
Bowen, F. W. Trustee	74	100	10.00
Bowen, F. W. Trustee	75	100	10.00
Bowen, F. W. Trustee	76	100	10.00
Bowen, F. W. Trustee	77	100	10.00
Bowen, F. W. Trustee	78	100	10.00
Comins, Thomas Trustee	108	100	10.00
Comins, Thomas Trustee	109	100	10.00
Comins, Thomas Trustee	110	100	10.00
Comins, Thomas Trustee	111	50	5.00
Comins, Thomas Trustee	112	50	5.00
Comins, Thomas Trustee	113	50	5.00
Comins, Thomas Trustee	114	50	5.00
Comins, Thomas Trustee	115	50	5.00
Comins, Thomas Trustee	116	50	5.00
Comins, Thomas Trustee	117	50	5.00
Comins, Thomas Trustee	118	50	5.00
Comins, Thomas Trustee	119	50	5.00
Comins, Thomas Trustee	120	50	5.00
Comins, Thomas Trustee	121	50	5.00
Comins, Thomas Trustee	122	50	5.00
Comins, Thomas Trustee	123	50	5.00
Comins, Thomas Trustee	124	50	5.00
Comins, Thomas Trustee	125	50	5.00
Comins, Thomas Trustee	126	50	5.00
Comins, Thomas Trustee	127	50	5.00
Comins, Thomas Trustee	128	50	5.00
Comins, Thomas Trustee	129	50	5.00
Comins, Thomas Trustee	130	50	5.00
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Comins, Thomas Trustee	132	50	5.00
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Comins, Thomas Trustee	134	50	5.00
Comins, Thomas Trustee	135	50	5.00
Comins, Thomas Trustee	136	50	5.00
Comins, Thomas Trustee	137	50	5.00
Comins, Thomas Trustee	138	50	5.00
Comins, Thomas Trustee	139	50	5.00
Comins, Thomas Trustee	140	50	5.00
Comins, Thomas Trustee	141	50	5.00
Comins, Thomas Trustee	142	50	5.00
Comins, Thomas Trustee	143	50	5.00
Comins, Thomas Trustee	144	50	5.00
Comins, Thomas Trustee	145	50	5.00
Comins, Thomas Trustee	146	50	5.00
Comins, Thomas Trustee	147	50	5.00
Comins, Thomas Trustee	148	50	5.00
Comins, Thomas Trustee	149	50	5.00
Comins, Thomas Trustee	150	50	5.00
Comins, Thomas Trustee	151	50	5.00
Comins, Thomas Trustee	152	50	5.00
Comins, Thomas Trustee	153	50	5.00
Comins, Thomas Trustee	154	50	5.00
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Comins, Thomas Trustee	156	50	5.00
Comins, Thomas Trustee	157	50	5.00
Comins, Thomas Trustee	158	50	5.00
Comins, Thomas Trustee	159	50	5.00
Comins, Thomas Trustee	160	50	5.00
Comins, Thomas Trustee	161	50	5.00
Comins, Thomas Trustee	162	50	5.00
Comins, Thomas Trustee	163	50	5.00
Comins, Thomas Trustee	164	50	5.00
Comins, Thomas Trustee	165	50	5.00
Comins, Thomas Trustee	166	50	5.00
Comins, Thomas Trustee	167	50	5.00
Comins, Thomas Trustee	168	50	5.00
Comins, Thomas Trustee	169	50	5.00
Comins, Thomas Trustee	170	50	5.00
Comins, Thomas Trustee	171	50	5.00
Comins, Thomas Trustee	172	50	5.00
Comins, Thomas Trustee	173	50	5.00
Comins, Thomas Trustee	174	50	5.00
Comins, Thomas Trustee	175	50	5.00
Comins, Thomas Trustee	176	50	5.00
Comins, Thomas Trustee	177	50	5.00
Comins, Thomas Trustee	178	50	5.00
Comins, Thomas Trustee	179	50	5.00
Comins, Thomas Trustee	180	50	5.00
Comins, Thomas Trustee	181	50	5.00
Comins, Thomas Trustee	182	50	5.00
Comins, Thomas Trustee	183	50	5.00
Comins, Thomas Trustee	184	50	5.00
Comins, Thomas Trustee	185	50	5.00
Comins, Thomas Trustee	186	50	5.00
Comins, Thomas Trustee	187	50	5.00
Comins, Thomas Trustee	188	50	5.00
Comins, Thomas Trustee	189	50	5.00
Comins, Thomas Trustee	190	50	5.00
Comins, Thomas Trustee	191	50	5.00
Comins, Thomas Trustee	192	50	5.00
Comins, Thomas Trustee	193	50	5.00
Comins, Thomas Trustee	194	50	5.00
Comins, Thomas Trustee	195	50	5.00
Comins, Thomas Trustee	196	50	5.00
Comins, Thomas Trustee	197	50	5.00
Comins, Thomas Trustee	198	50	5.00
Comins, Thomas Trustee	199	50	5.00
Comins, Thomas Trustee	200	50	5.00

And in accordance with law, and an order of the Board of Directors, made on the 10th day of January, 1873, so many shares of each parcel of such stock as may be necessary will be sold at public auction, at the office of the company, room 22, San Francisco, California, on Monday, the 18th day of April, 1873, to pay the delinquent assessment, together with costs of advertising and expenses of sale.

By order of the Directors. WM. H. MARTIN, Secretary.

Office, 323 Kearny street, Room 22, San Francisco, California. f8-31

Spring Mountain Mining Company--Location of works, Ely District, Lincoln County, State of Nevada.

Notice--There are delinquent upon the following described stock, on account of assessment (No. 2) levied on the 15th day of January, 1873, the several amounts set opposite the names of the respective shareholders, as follows:

Name.	No. Certificate.	No. Shares.	Amount.
Boyd & Davis, Trustee	371	50	\$12.50
Boyd & Davis			

Machine Builders.

ESTABLISHED 1851.

PACIFIC IRON WORKS,

First and Fremont streets,

SAN FRANCISCO

IRA P. RANKIN, A. P. BRAYTON,
GEO. W. FOGG, Superintendant.

Steam Engines and Boilers,

MARINE AND STATIONARY,

IRON AND BRASS CASTINGS

Mining Machinery of Every Description,

And all other classes of work generally done at first-class establishments, manufactured by us at the lowest prices, and of the best quality.

Particular attention paid to Jobbing Work and Repairs.

N. B.—Sole Agents for sale of HUNTOON'S CELEBRATED PATENT GOVERNOR.

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GODDARD & CO.

FULTON

Foundry and Iron Works.

HINCKLEY & CO.,

MANUFACTURERS OF

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Quartz, Flour and Saw Mills,

Improved Steam Pump, Brodie's Improved Crusher, Mining Pumps, Amalgamators, and all kinds of Machinery.

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These Works have lately been increased, by additional Tools, and we are now able to turn out any kind of work, equal to and cheaper than any establishment in the State; that is to say—

STEAM ENGINES,

Flour and Saw Mills,

QUARTZ MACHINERY

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AND MACHINERY MADE OF EVERY DESCRIPTION.

Improved Safety Store Hoists,

Fitted with Cutting's Patent Cams, unequalled for safety, convenience and cheapness. This Hoist can be built for about half the price of any other in use. To be seen at HAWLEY & CO.'S.

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Pracy's Celebrated Governor.

TURNING LATHES, Etc., constantly on hand. 47231f

UNION IRON WORKS,

Sacramento.

ROOT, NEILSON & CO.,

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STEAM ENGINES, BOILERS,

CROSS' PATENT BOILER FEEDER AND SEDIMENT COLLECTOR

Dunbar's Patent Self-Adjusting Steam Piston

PAOKING, for new and old Cylinders.

And all kinds of Mining Machinery.

Front Street, between N and O streets, SACRAMENTO CITY.

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Rolling Mill Company,

SAN FRANCISCO, CAL.

Established for the Manufacture of

RAILROAD AND OTHER IRON

Every Variety of Shafting,

Embracing ALL SIZES of

Steamboat Shafts, Cranks, Piston and Connecting Rods, Car and Locomotive Axles and Frames

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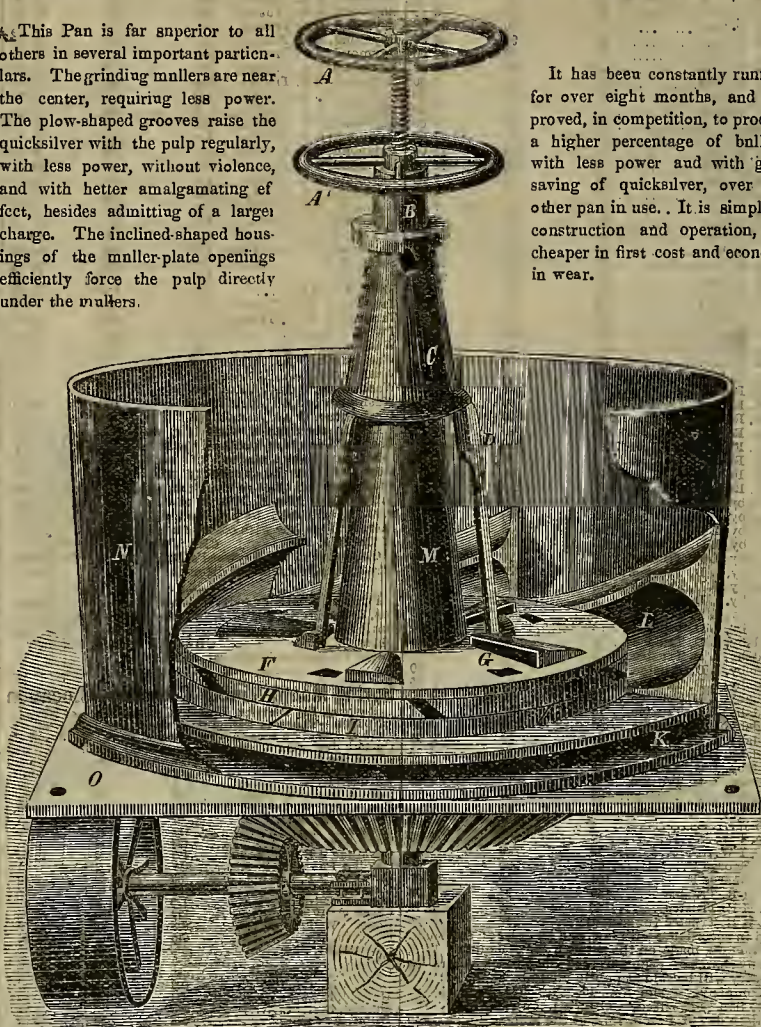
Of every description and size.

Orders addressed to PACIFIC ROLLING MILL COMPANY, P. O. box 222, San Francisco, Cal., will receive prompt attention.

The highest price paid for Scrap Iron. 97143

STEVENSON'S PATENT MOULD BOARD AMALGAMATING PAN.

This Pan is far superior to all others in several important particulars. The grinding millers are near the center, requiring less power. The plow-shaped grooves raise the quicksilver with the pulp regularly, with less power, without violence, and with better amalgamating effect, besides admitting of a larger charge. The inclined-shaped housings of the miller-plate openings efficiently force the pulp directly under the millers.



Manufactured at the Golden State Iron Works (Co-operative), 19 First street, S. F.

Where it can be examined and further particulars be learned; or persons may apply to the inventor and patentee, Mr. C. O. STEVENSON, at the Douglas Mine, GOLD HILL, STATE OF NEVADA, where the Pans have long been in constant operation. 15v20-1mr, 1amt

GEO. W. PRESCOTT. C. W. SCHEIDEL. W. R. ECKART.

PRESCOTT, SCHEIDELL & CO.,

MARYSVILLE FOUNDRY.

Corner of B and Fourth streets, Marysville, Cal.

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STATIONARY AND PORTABLE

SAW AND GRIST MILLS,

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Quartz Crushing and Amalgamating Machinery

Of every description, constantly on hand.

Plans and estimates furnished upon application. Repairs upon all kinds of Machinery promptly made, and at moderate charges. Having unrivalled facilities, we are prepared to make to order, at short notice, anything required in our line. Specimens of our work may be seen in all the mining regions on this coast.

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IRON CASTINGS of all descriptions at short notice. All orders punctually executed in time agreed on. Particular attention paid to making superior Shoes and Dies. Among the special castings of this Foundry are the well known CALLAHAN GRATE BAR, of superior merit for burning screenings—all size Bars. STEIGER'S JACK SCREWS, all sizes. Superior, compact and effective Horse Powers, Pumps, Agricultural Castings, Ingot Moulds, Assaying and Refining Retorts and Kettles, and a great variety of other and special castings.

STEIGER & BOLAND Proprietors.

Steiger & Boland are the sole Manufacturers of the Improved Hepburn Roller Pan. The patterns having all the improvements to those Pans, are at the Occidental Foundry, enabling the Establishment to deliver all pans and parts thereof with uniformity, finished in the best style, and at the lowest possible price. Pan Castings furnished the trade, with liberal facilities for erection, &c. All persons are cautioned against making, selling or using these Pans, except through the authorized agents and manufacturers, viz., Steiger & Boland, of the Occidental Foundry, S. F.

22v25-3m

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It has been constantly running for over eight months, and has proved, in competition, to produce a higher percentage of bullion, with less power and with great saving of quicksilver, over any other pan in use. It is simple in construction and operation, and cheaper in first cost and economy in wear.

Miners' Foundry and Machine Works,

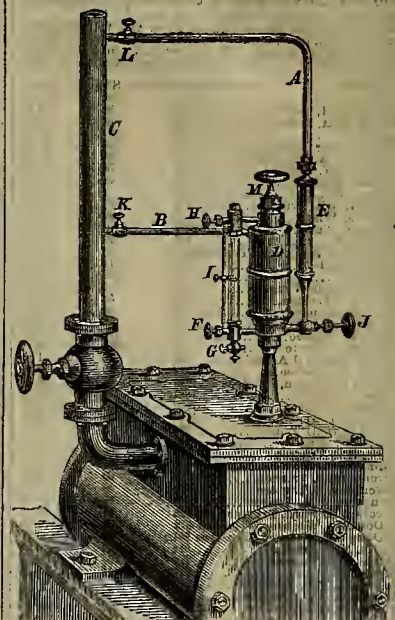
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Machinery and Castings of all kinds.

Machinery.

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Awarded by the Mechanics' Institute Fair, San Francisco, and State Fair, Sacramento, 1871.

These Lubricators are acknowledged by all engineers to be superior to any they have ever used; feed constantly by pressure of condensed water supplied by pipe A, regulated under this oil by valve J, and forced out through check valve and pipe B into the steam pipe C; it then becomes greasy steam, passes to all the valves and cylinder at every stroke of the engine; glass tube I indicates amount used per hour. Packing on rods and stems lasts longer, and the rings on the piston will not corrode. One pint of oil will last from three to six days, according to speed and size of engine; I, sliding gauge; K, valve to shut off when engine stops; H, F, valves to shut off in case of frost; steam does not enter the cup; it is always cool; warranted to give satisfaction. Patented February 14, 1871. Manufactured by California Brass Works, 125 First street, S. F. 24v23tf

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CAPITAL.....\$1,000,000.

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WM. H. TAYLOR.....President
JOSEPH MOORE.....Vice-President and Superintendent
LEWIS R. MEAD.....Secretary
24v17-07

A. HANKE'S

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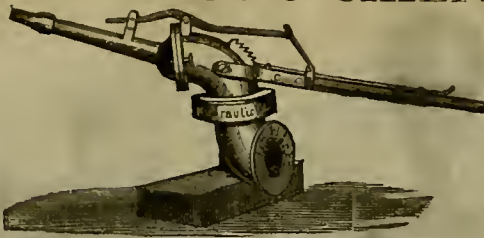
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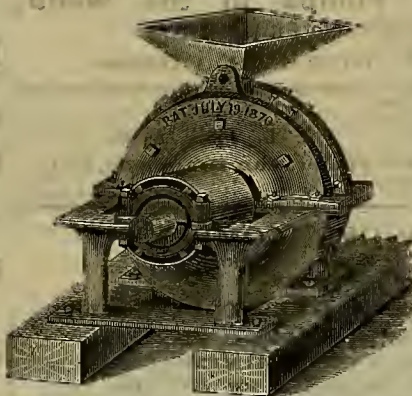
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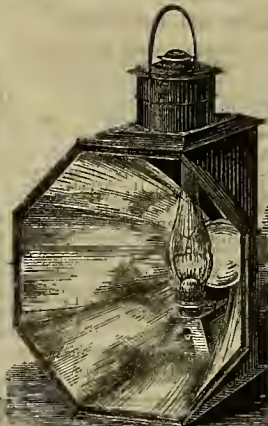
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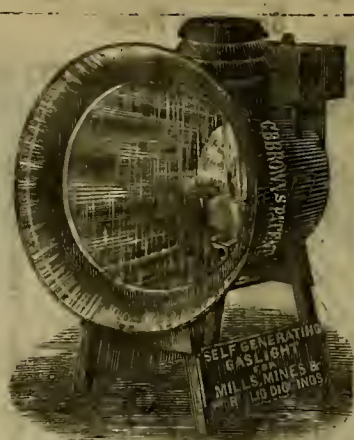
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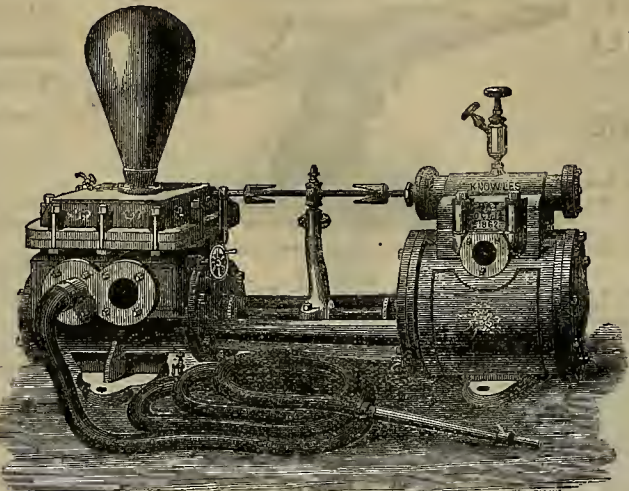
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SAN FRANCISCO, SATURDAY, MARCH 15, 1873.

VOLUME XXVI.
Number 11.

Paul's Pulverizing Barrel.

[Written for MINING AND SCIENTIFIC PRESS by A. Blatchly.]

Our engraving represents a view of Paul's Pulverizing Barrel and one of the heads, showing the arrangement of the sides of the barrel and the screens. The ore is fed into the barrel through the trunnion, *D*, from the hopper, *C*, and as soon as it is ground sufficiently fine it passes through the sides, *E E*, which are perforated, and falls on the screens, *H H*. The portion which is ground fine enough passes through the screens and falls down on the outside of the barrel, but what is not as fine passes back into the barrel and is reground.

In the most improved form of this barrel the ore is screened three times before it becomes fit for amalgamating. The inside staves are about a half an inch thick, and are perforated with holes one-fourth of an inch in diameter; outside of these plates is a screen of Russia iron, such as is used in stamp mills, and on the outside of the barrel is a screen of No. 90 wire cloth, through which all of the ore ultimately has to pass.

The advantages of this arrangement are that no extra machinery is required to return the ore to the barrel for regrounding, and the screens are never overloaded as is often the case when fine screens are used. This barrel operates without iron balls, large pieces of quartz being substituted in their stead, so that the grinding is mainly quartz against quartz, reducing the cost of iron and adding to the efficiency of the barrel. As the barrel revolves the ore is carried up on its sides until it begins to roll over and the large pieces pass from the top to the bottom of the ore and strike the ore at the bottom with considerable force, operating like a hammer or stamp, while the mass of finer ore rolls over, grinding like a pau or an arastra.

In this barrel we have both percussion and grinding; after a short time the grinding leaves the particles of ore in a spherical or oval form, and further grinding produces less effect than it did at first, but leaves them in the best form to be reduced by percussion, which leaves them in an angular form which is the best shape for reduction by grinding. This is, perhaps, the only instance where grinding and percussion have been combined in one machine, one assisting the other.

The movement of the ore in the barrel is somewhat singular, being governed by the laws which regulate the movements of the pendulum. When a barrel revolves with sufficient rapidity to keep the ore in constant motion the ore makes a certain number of movements or rotations in a minute, and in a barrel of a given diameter no matter how much the speed is increased the number of movements remains the same. Of course if the barrel revolves rapidly the movements are longer, as when an increase of power is applied to a pendulum, the vibrations are longer, but the number remains the same.

Owing to the centrifugal force, the grinding capacity of the barrel increases in a greater ratio than the number of revolutions of the barrel, so that with twenty revolutions per minute it will do more than double the work than it will with ten. Though this pulverizer has been used for dry crushing only, no doubt it could be applied to wet, and its capacity increased in the same ratio as a stamp mill, which will crush as much again wet as it will dry. A barrel pulverizes, according to the number of revolutions that it makes in a minute and the amount of ore in it.

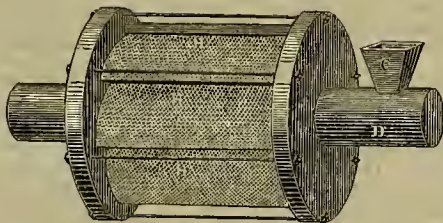
Either of these conditions can be regulated according to the amount of power available,

which is a great advantage with a variable force like a water power when the work can be adapted to the power. The capacity of large barrels of this construction is enormous. One six feet in length and six feet in diameter will grind thirty tons per day, so that it will pass through a No. 90 wire-cloth by giving a proper speed. Larger ones can be made that will crush from fifty to one hundred tons in twenty-four hours. The merits of this pulverizer are unknown in California, although it is a California invention, and of course it is not appreciated; but for dry crushing it is not surpassed by any machine now in use. Its great advantages over other dry crushers is the facility with which the ore can escape from the machine after it is ground. In this respect it fully equals a wet crushing stamp mill. This barrel is applicable to other purposes of crushing such as druggists require, or for grinding red pepper, etc.

Foundry Notes.

Pacific Iron Works.

At the Pacific Iron Works are to be seen a large pair of hoisting engines, intended for use at the Black Diamond Coal Company's mines. They are nearly completed, and the size will be appreciated when it is known that they will weigh nearly 90 tons. The engines have 24-inch cylinders, with a five-foot stroke. They



PAUL'S PULVERIZING BARREL.

are built on the English plan of hoisting-engines, that is, the drum is placed on the engine-shaft, and is direct, acting without any intermediate gearing. Both engines work together on one shaft. This method entirely does away with the large gear-wheels generally used. The engines are handsomely finished; they are of rather peculiar construction.

At this foundry they are doing considerable work for the Oakland Smelting and Refining Works, an enterprise which will shortly commence operations in Alameda County. They are making refining kettles, furnaces and machinery to go with them. It is stated that these works will be of a substantial and permanent character, and as such will of course be of great benefit to this Coast. In view of making the whole thing a success, the proprietors engaged the services of an experienced Prussian engineer, who is building the works, which will be put up with all the late improvements, so as to do the work as well as it is done abroad.

They have lately turned out at the Pacific Iron Works a No. 7 Root-blower, the largest ever made on this Coast, for the Overman mine. It weighed about 12,000 pounds. They are doing extensive repair-work on the steamer Pelican, putting in a surface-condenser, and overhauling her generally. The job is nearly completed. They made, a short time since, a large set of hoisting works for the Kennedy mine, in Amador county, with boilers, gear, etc.; and another set for the Oneida mine, in the same county. The usual amount of miscellaneous work is being done at the foundry.

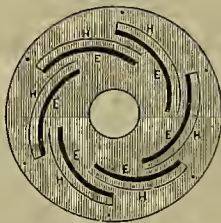
A recent addition to the tools of the foundry is a radial drill and an upright boring-mill,

both made at the Niles Work, in Cincinnati. They are both the latest improvements in that kind of machinery.

The Empire Foundry.

Savage & Son, 141 Beale street, is principally employed in manufacturing light castings of all descriptions, particularly stoves. This institution has been established about six years. The pattern of stove made there, which occupies most of their attention, is the "Occident." They also make grates, fenders, stove hollow-ware, cauldrons, kettles and hollow-ware in general.

This firm was the first one who made iron burial caskets, and received a silver medal for them from the Mechanics' Institute at the Fair of 1871. They are made of iron and grained to represent wood. They also make soil pipe of various sizes. Day & Prior, who sell most of this pipe, formerly imported it, but now buy all their pipe from this firm. Among the other light castings made at this foundry are hydrants and sash weights, the latter of which used to be imported. The same is the case with road scrapers, which have ceased to be imported since they began to make them here. Although the foundry is employed principally



on light castings they are prepared to do heavy work also.

The Mining Commissioner's Report for 1871.

We have received the sixth report of the United States Mining Commissioner, which is that of 1871, being the fourth annual report of R. W. Raymond, the present Commissioner. It is entitled "Statistics of Mines and Mining in the States and Territories west of the Rocky Mountains." The volume contains 523 pages, exclusive of the index, which is voluminous. The Commissioner has done very well to get up the report in the manner he has with the small appropriation devoted to that purpose. The sum is only \$10,000, and at least \$25,000 would be required to carry out a comprehensive plan, including resident agents in all the leading districts. The Commissioner says that the amount of money he spent during the year, in the collection of statistics, aside from the work of himself and one assistant, was only \$500. The result of this is that Oregon, Idaho, New Mexico and parts of other States and Territories, are but slightly treated of in this volume, and would have been necessarily ignored altogether if it had not been for contributions which were sent in to the Commissioner by parties interested in certain localities and mining generally.

The chapter on California is the longest and most interesting in the work. It was prepared principally by Mr. W. A. Skidmore, Mr. Raymond's deputy, and contains considerable information, especially concerning the gravel mines. Mr. Skidmore traveled in most of the districts referred to and gathered many interesting items, and he has also drawn liberally

on newspaper correspondence concerning particular localities and subjects, showing that he has paid proper attention to his duties. Some articles have been contributed by well known persons, and taken altogether the chapters bow as much care as any in the book.

The chapter on Nevada is very comprehensive also and is well stored with statistics culled from mining companies' reports, etc., and contributed by parties resident there. The assessor's books also furnish their quota. Montana has about 40 pages devoted to it and Utah about 30 pages. Arizona is covered with six pages and New Mexico with three; 26 pages are devoted to Colorado and nine pages to Wyoming. Metallurgical processes are not discussed to the length they were in the last report. The mining law is given and considerable space devoted to American schools of mining and metallurgy. The "miscellaneous" refers to a few mechanical appliances of mining, some papers on kindred subjects, the hullion product, etc. The work is only sparsely illustrated.

It is to be deplored that a larger appropriation has not been made so that it could have been in the power of the Commissioner to have paid outside parties to write up subjects connected with the mining interest. Another drawback is that very few of the reports are printed and what are issued are distributed among the constituents of Congressmen in the Eastern States where they are not of the slightest use. They can be made the communication for the dissemination of much useful knowledge among the common miners if circulated with half the liberality of the Agricultural Reports, which they are not. The Commissioner even complains that he is unable to send copies of the Report to parties who have voluntarily contributed articles to aid in its completion. The scope of country to which attention should be turned, is large, embracing all the extensive mineral region of the country west of the Rocky Mountains, extending from the borders of British Columbia to the Mexican boundary. It is necessarily out of the power of any one man to direct his personal attention to all the localities within this section of country, and to do so properly it is necessary to have a competent corp of deputies. Under the present appropriation this is impossible. The industry which the Commissioner represents is not only an extensive but a growing one, and, moreover, one in which accuracy of detail is necessary. The latest improvements in its mechanical appliances should be studied and properly tested. The latest methods of working certain classes of ores should be investigated and reported on in detail. Improved systems of working mines, both as regards economy and speed should be examined. All these, and many other points are under the supervision of the Mining Commissioner, but unfortunately he must rely on the statements of outside parties, sometimes interested, or must do without them altogether.

Another great drawback to the usefulness of their Reports is the very unsatisfactory delay in their publications. Here it is the middle of the third month of 1873, and only the advance sheets of the Report of 1871 are to be had. The country makes enough out of the mining industry, in taxes, etc., surely, to give it proper representation. Why cannot these Reports be issued in sufficient numbers to be distributed freely throughout our mining districts? As it is, even very few Superintendents have them, much less the miners themselves. We will, from time to time, make such extracts from Mr. Raymond's Report as will be interesting to our readers, since it is hardly probable that one in one hundred will ever see the Report itself.

CORRESPONDENCE.

Rush Valley Mining District, Utah.

[Written for the MINING AND SCIENTIFIC PRESS.]

Having recently paid a visit of inspection to the mining districts situated in the Oquirrh range of mountains, I have gained some valuable and reliable information about the districts, and more particularly in regard to Rush Valley, which may be interesting to your readers, together with a brief description of the district and its principal mines. This district is not, perhaps, as widely known as many others, but it is second to none in the quantity and quality of its ores, and the natural advantages of its geographical position, which eminently qualify it for becoming the most successful smelting center in the Territory.

Stockton or Rush Valley Mining District is situated on the western slope of the Oquirrh mountains, east of Tooele Valley, Tooele county, Utah Territory, and is distant 35 miles from Salt Lake City, from which it is accessible by a daily line of fine stages, run by Wines & Kimball. The district is about 6 miles long by 5 miles wide, and contains a large number of valuable prospects. It was located in 1864 and the city of Stockton was laid out by General Connor during the same year. The ores are principally argentiferous galena, and carbonate of lead, averaging 60 per cent. lead and from \$25 to \$150 in silver per ton, and for smelting purposes are unsurpassed by the ores of any district in Utah. As I before stated Stockton forms

A Natural Smelting Center

For the following reasons. Owing to its location, ore coming from the adjacent districts in any direction is brought down hill, and is therefore very easily transported there. Charcoal can be obtained at $\frac{1}{2}$ the cost than in the Jordan Valley and other smelting localities. Lime for flux costs \$9 per ton at some of the smelting works in the Territory while in Stockton it can be procured at the moderate price of 75 cents per ton, as it is found in large quantities in the immediate vicinity. Iron for fluxing is also procured in Rush Valley and delivered at the smelting works for \$14 per ton, of precisely as good quality as Wyoming Hematite, furnished in Salt Lake City at from \$16 to \$20 per ton. The immense advantage gained by the reduction in part of these articles needs no remark or comment. But the one great and peculiar advantage of Stockton is that it is the center of a mineral region which contributes all the various ores that can be profitably employed by a smelter, and at a comparatively inconsiderable cost. The silver and lead ores of Dry and East cañons in a calcareous gangue, flux well with the silicious ores of Camp Floyd. Some of the Dry Cañon mines produce argentiferous oxides of iron, which yield a quantity of silver, and render entirely unnecessary the addition of iron ore, which is just as expensive both to obtain and smelt as these ferrous ores of Dry Cañon. The easily smelted ores of the mines in the immediate vicinity of Stockton can also be used as a flux for all the other ores of surrounding districts as their peculiar composition renders their mixture practicable with others in any quantity whatever, as any amount of lead can, by their use, be added to a charge for the furnace, to render the quantity of lead in proper proportion to the other ingredients, without also adding to the charge any detrimental substance which would be necessary if galena were used for that purpose. There are

Two Smelting Works

At Stockton, the Waterman works having two stacks with a capacity of 15 tons each per diem, and the Jacobs & Co. works, with three blast furnaces, having each capacity of 20 tons per diem. The machinery consists of a 45-horse power upright Starkey engine, a 60-horse power boiler, a Dodge crusher with rolls, having a capacity of 100 tons daily and two Sturtevant blowers No. 7. There is also in use a Niagara steam and force pump, and the water is supplied from a tank 60 feet above the building. All the arrangements of this company's works are very convenient and complete.

A run of 30 days at these works have produced the following results which will be found a very

Interesting Item

To others besides those who are miners by profession. Ore used 570 tons, costing \$4,998, taken principally from the mines owned by the company. Cost of smelting \$16.32 per ton—\$9,325. Bullion produced, 139 tons; market value of bullion \$42,172. Freight to market \$1,114, leaving a net profit of \$41,056. The average yield of these furnaces is 83 per cent. of lead in the ores, and 92 per cent. of the amount of silver. Among the

Principal Mines of Rush Valley

Is the Silver King, which has a shaft 300 feet in depth and 150 feet of drifts, showing good bodies of fine ore. The Silver King No. 2 is also a promising mine, and is now more than 60 feet deep. The Vulcan is perhaps the most promising prospect in the camp, and will probably become one of the finest mines in the Territory when fully developed. The vein is three feet wide, and the ore, like a large majority of the Stockton ores, is very easy of reduction, carrying a percentage of lead, and is used as a flux for other ores. It assays from

\$50 to \$60 in silver per ton, and about 40 per cent in lead. Work is being prosecuted actively on this mine, with very encouraging results to the owners. The Quandary is also a very good prospect, having a shaft 150 feet in depth, showing plenty of carbonate and galena ores. The Margaret is 50 feet down and the Muscaten 60 feet, both prospecting well. The following are the names of other well developed mines, which time prevents me from particularizing in regard to the special developments of each. Metropolitan, Legal Tender, Our Fritz, Tucson, Silver Queen, St. Patrick, Bolivia, Pleasant Hill, Defiance, Last Chance, Potomac, Eureka, Great Basin, Mineral Hill, Peabody, Mary Bell, Great Central and Lady Douglass. B. A. M. F.

Salt Lake City, Utah, March 3d, 1873.

Effect of Frost on Iron.

EDS. PRESS:—I am sorry to see such articles in your paper as "Scientific Experiments with Iron," made by M. Carom, wherein it is stated that he tested samples of iron at temperatures of from 0° to 18°, and concludes that iron does not become brittle by cold.

Every wood-chopper, and every man who uses a log chain in a cold, frosty morning, knows better. Axes and chains break like pipe-stems in extreme cold. The reason is this: That in extreme heat or cold the crystals of iron do not retain their original form and consequently do not perfectly adhere; melted iron is fluid with but little adhesive properties; cold iron, to a certain limit, is so much contracted as to impair the original shape of the crystals. The cohesive power of iron is greatest where the original shape of its crystals are maintained. The crystals of iron are oval—elliptical shaped—in which form they adhere most perfectly. Repeated heating and hammering a bar of iron flattens these oval crystals and they then separate in scales, and cleave off, not having sufficient power to adhere when in that shape. Thus successive heatings and hammerings destroy the whole bar.

Rods of iron under extreme tension and vibration, are said by mechanics to have become crystallized, when in fact they have become decrystallized; and, losing their strength, have to be taken down and heated red hot, approximating to a fluid state. The crystals are enabled to resume their original form, in which they adhere most perfectly, and the rod or bar regains its usual strength.

The shafts of steamboat engines, that are under great torsion and tension, and effects of vibration, caused by the motion of the machinery, are decrystallized and easily broken. It is easy to prevent, in great measure, the constant breakage of steamer shafts by doubling or trebling the number of bearings to prevent the vibratory motion, which is the principal cause of breaking, and also by welding up the faggots in a different form.

WM. WAYNE FITCH.

Snison City, Feb. 15th, 1873.

The experiments of Mr. Carom, to which allusion is made above, are by no means received as conclusive as to the effect of iron on cold—although the faith of many in the generally received theory has been severely shaken by the result of these experiments. Carom's experiments with iron rails appear to show that instead of being weaker under the influence of extreme cold, they are actually stronger and the greater number of breakages in winter than in summer, is attributed to the fact that the road-bed is less elastic in winter. This last fact may reconcile experimental deductions with experience in this particular; and may not a similar fact also be made applicable to the breaking of log chains, as cited by our correspondent? May not the breaking in such cases arise from the more sudden, impulsive effort made by cattle in winter, when they are goaded into a heavy pull, than they would exert under the enervating laxative influence of the heat of summer? Again in the breaking of axes in winter, may not such accidents be attributable to the greater rigidity of the frozen wood, rather than to any effect which the frost may have upon the iron of the ax?

There are very many things in regard to the molecular changes of iron which are but little understood. Mr. Roehling states that the most fibrous bar may be broken so as to show a granular and somewhat crystalline fracture, and this without undergoing any molecular change in the texture. "Take," he says, "a fibrous bar, say ten feet long, nip it in the center all round with a cold chisel, then poise the bar upon the short edge of a large anvil and a short piece of iron placed eight or nine inches from the edge on the face of the anvil, and strike a few heavy blows upon the nip so that each blow will cause the bar to rebound and to vibrate intensely, and the result will be a granular and somewhat crystalline fracture. Now take up the two halves and nip them all around again, about one or two inches from the fractured ends, and break them off by easy blows over the round edge of the anvil, and the fiber will appear again." This experiment proves that a break caused by sudden jars and intense vibration may show a granular and even crystalline fracture, without having changed the molecular arrangement of the iron.

Robinson District, Nevada.

[Written for the MINING AND SCIENTIFIC PRESS.]

EDITORS PRESS:—Judging from present appearances Robinson District is destined to attract considerable attention in the near future. The mineral deposits or veins are generally large, sometimes of immense proportions, and although much of the ore is comparatively poor in the precious metals, its great abundance and the facility with which it can be mined, coupled with superior facilities for reduction, will in a great measure compensate for the slight deficiency in the quality.

The district is situated in White Pine county, about 45 miles east of Hamilton, and in the Egan range of mountains. The Hamilton and Schell Creek stage (supposed to be tri-weekly) passes through the camp. The principal town, Mineral City, is pleasantly situated in a narrow cañon known as Robinson Valley. Murray Creek, one of the largest mountain streams of Eastern Nevada, flows through the lower portion of the cañon, and with abundant fall can be made to furnish unlimited water-power for mills and furnaces.

The Mineral Belt

Is about one mile wide and eight miles in length. Its longitudinal axis is east and west, and at right angles to the general course of the mountain range. The formation consists partly of stratified rocks, mountain limestone of the subcarboniferous period, and partly of igneous rocks, (Rhyolite) breaking through granites. The Rhyolite appears to cover quite extensive areas of the granite, and forms most of the low rounded hills in the central and western portion of the district; limestone sometimes forms the capping of the granite hills, but in no case is it found over the igneous rocks. Geologically, this is probably the most recent of the mineral belts found in Eastern Nevada. Mineral veins are found traversing the lower carboniferous rocks in all portions of this district, while in White Pine and other districts they rarely penetrate the Devonian, and are mostly confined to the Silurian.

The eastern portion of the district is situated on both sides of the cañon near the town. The formation is stratified limestone with a north and south strike, and an easterly dip at an angle of 10°. The ore found here is mostly some form of argentiferous and auriferous lead. Some of the veins show considerable copper oxides near the surface.

The Altman Mine

Is the best developed one in this part of the district, and may be taken as a fair representation of its class. It is situated about one-half mile east of Mineral City. It is the property of the Cauton Company. It was formerly worked for iron for fluxing other ores, and was not known to be of any particular value for other purposes until sometime during the past summer; large veins and deposits of carbonate of lead were found traversing the ironstone in every direction. Free gold in paying proportion is found associated with silver, and can be easily washed out of the soft friable lead ores. The seams and deposits of carbonate vary from 1 to 30 feet in thickness, and probably comprise about 1-10 of the whole vein map. The iron contains no silver and but a trace of gold, but the carbonate ore will average about \$45 per ton. The developments consist of one tunnel 400 feet in length, which cuts the vein 200 feet from the surface. Several shafts have been sunk along the line of the lode to depths varying from 60 to 100 feet.

Drifts, aggregating several hundred feet in length, have been extended from the bottom of the shafts in every direction developing a body of ironstone 800 feet in length by 100 feet in thickness traversed by veins of lead ore, and its boundaries have not yet been determined in any direction.

The Hays Mine

Is the next in importance, and is situated 1½ miles west of Mineral City. It is owned in San Francisco. The formation is a stratified silicious limestone, nearly approaching quartzite in composition. The vein courses east and west and dips to the south at an angle of about 70°. As it cuts the stratification both horizontally and vertically it is without doubt a true vein. It is considerably broken and very irregular, varying in thickness from 2 to 7 feet. The main opening is an incline shaft following the lode to a depth of 130 feet from the surface. The ore is considered rich, and several tons of first-class selected for shipment will probably yield something like \$200 per ton. The second-class is worth about \$60 per ton. All the ore found in the mine is very refractory, and I apprehend that the owners will experience considerable difficulty in saving both the gold and silver by any process of milling. The Miami copper mine is situated 2 miles west of the last named. It is opened by a perpendicular shaft 30 feet deep, showing a vein 30 inches thick inclosed in well defined walls of Rhyolite. It is a perpendicular vein with an east and west course. The ore is principally red oxide, containing considerable metallic copper, other ores of copper are found (but with the exception of some black oxide) in too small quantities to be of any commercial importance.

The Weslern

Is situated south of the last, and shows the same kind of ore, but with a larger and stronger vein so far as opened. The Kentucky near the

last is a large vein, and contains considerable silver with copper and iron pyrites. Three miles still further west is the so called

New District.

The formation is principally limestone. The veins are large and have the same character as those found in the eastern portion of the district. Some rich horn silver ore was found in one of the mines in this vicinity about six months ago, and quite a rush was the consequence, but as there was nothing very wonderful the excitement soon subsided. Some of the veins show well and will doubtless eventually prove valuable property.

The Emma has been worked to some extent and shows a body of good ore six feet thick; assays run from \$30 to \$40 per ton. B.

What's the Matter?

[Written for the Press by Almarin B. Paul.]

This is a pertinent question, requiring a volume of figures to fully answer. "What's the matter?" asks the working man, who devotes his time in productive labor, and can give no moments to the study of statistics. He hears of grain products amounting to millions of dollars per annum, unequalled in any land, of tens of millions of gold and silver from our mountain ranges, and yet he is only able to gain a scanty subsistence and sees desolation at almost every tread. "What's the matter?" asks the farmers. My fields produce abundant, and foreign rates for grain, should make me rich, yet I obtain only a scanty reward for my toil. "What's the matter?" asks the miner in the mountains, who any day can plant his foot on riches enough (?)—strata of gold and silver—to supply wealth and comforts to his household, and all about him; and yet there it must lay—for he is bound head, hand and foot, for the want of a little aid in his legitimate enterprise of development.

"What's the matter?" thinks I, as I travel through our mountain towns, and see so much desertion of home-like cottages, and where flowers bloom, the vine twines and the fruit grows neglected. "What's the matter?" Ah, it is serious, and unless the mass step forward to the rescue, the few are to become masters and the many slaves.

The answer to it all may be condensed under four heads, viz:—Dissipation, Speculation, Interest and Monopoly. It is by the two former that the individual sinks himself by his own actions; by the two latter he becomes poor indeed. The former eats his brain, muscle and soul; while the two latter swallow up all his worldly goods.

"But what are you going to do about it?" says one? "Get emigration." Emigration for what? Had we not better make ourselves a prosperous and happy people, first, by building up manufactures, and thus absorbing our now idle and too much dissipated population into productive channels before we urge more into our midst? Why seek to allure emigration when monopolies rule all products, and interest on money precludes the building-up of manufactures? Let us spend our efforts in uprooting the evils we know of, then emigration will follow of its own accord. From the evils which now beset the masses there are only two speedy remedies. 1st: Dissipate less, and work with brain and muscle more. The next is cooperation. Capital combines and becomes a power. Let muscle and brain combine and a greater power at once arises. Welded by reason, it is wealth, as well as strength.

Coöperate in manufactures, and get all the profits. Coöperate in farming and transportation of your headstuffs to their market. Coöperate in mining industries—build your quartz mills yourselves, or associate labor that can do it; mine your ores and mill them in concert, and divide the products. Coöperate and turn this China evil to a profit. You must do it. The poor man has two powers against him, viz: Capital and Chinese labor, while the general progress of the country have several. "Why stand ye all the day idle." The land is bountiful to the hand of industry. Wait no longer for Capital—make it—and while so doing, remedy the other surrounding evils.

With the working man there must be activity. He must plow under this cheap labor element by his activity, industry and frugality or they will plow him under by theirs. Which shall it be? Talk is of no avail. Only in well studied plans of industry is their security and prosperity for us all. It, therefore, behoves every one to do his part in inaugurating a more healthy condition of affairs.

A WORKING man, it is stated, has been, for the first time, elected to the House of Commons of the Canadian Parliament; Wilton, the new member alluded to, is a painter in the shops of the Great Western Railway Company, at Hamilton, Ontario, but he has also been accustomed to devote his spare hours to study, so that he is now one of the most thoroughly educated men in the city where he resides.

BROAD VS. NARROW GAUGE.—It is now thought by some eminent railway engineers that the true advantages of the broad gauge would have been in using rails two or three times heavier than the ordinary rails, and engines in proportion, so as to be able to make a running time that would absolutely defy the competition of the common gauge railroads.

MECHANICAL PROGRESS.

The Band Saw and Ban Sawing.

(Continued.)

In continuing our extract from the very interesting article on "Band Saws" from Richards' treatise on Wood-Working, which we noticed last week, we now come to the subject.

Band Saw Blades.

The blades for hand saws should have what is technically known as spring temper, or if different, a shade above in hardness. If much harder, they are liable to fracture from irregular tension, or concussion of any kind, expensive to sharpen, and difficult to set without breaking the teeth. Rendered softer than this, they are simply worthless, and should have no market value. The amount or degree of temper in a saw blade is quite an obscure matter, one that cannot be determined to any certainty by observation, and hardly by experiment, for although a blade is properly tempered throughout nine-tenths of its length, and certain spots are drawn, as is often the case in grinding, or glazing, the blade is more worthless than if soft throughout.

The purchasers of saws are, therefore, incapable of testing the quality of the saw, and the time of buying must depend upon the good faith of the manufacturers, who usually, and very properly too, are understood as guaranteeing the saw to be of even and good temper, and of fine steel. The working quality, and indeed the whole value of the saw, is in great measure dependent upon the care and skill of the saw maker, of which there exist no evidence, or at least no *prima facie* evidence in the appearance of the blades when finished.

In selecting hand-saw blades a good plan is to roll the ends closely, and see if they will spring back to their first position. The texture of the steel can be examined by breaking a short piece from the end, the difference between coarse granular fracture, and fine lively-looking steel being familiar matter to most mechanics. To determine the straightness of the blade if not joined, unroll it on the floor, and by "sighting it," irregularities are easily detected.

Another most important matter is an exact parallel as to width; the slightest variation in this regard becomes a serious objection to the operation of a saw, producing scratches on the work, irregular action of the teeth, and consequent irregular tension of the blade through its cutting at intervals only.

Any variation of width between the two ends of a blade can be easily detected by lapping them, and placing the points of the teeth on a plane surface, which will show on the back any difference of width, however little it may be.

The pitch, depth, and form of teeth for band saws, is a matter about which there is such a diversity of opinion, that the only safe inference is, that it is either a matter of no great importance, or else not understood. We allude of course to saws for special purposes; for various modifications of the teeth are needed in different cases, and unfortunately the condition that has most to do with the change is continually varying, that is, the depth of the lumber. In considering saw teeth, we have first, pitch (distance between teeth); the inclination on front and back of the tooth (cutting angle); the form of the gullet, as it is termed, for holding the dust; the width of the base of the tooth, so as to give efficient stiffness to retain the "set"; and the kind of set given to the teeth.

It would be supposed that the experience of operating other saws would furnish all that could be learned of band saws, but this does not seem by any means to be the case. The thickness of the blades calls for every minute condition that will tend to keep them true, and to run in line. With a thick circular, or reciprocating saw, the case is different; it can be forced to its work, and made to operate without that nice regard to the condition and form of the teeth that must be observed in band sawing.

For soft wood, a pitch equal to one-half, and a depth equal to one-fifth of the width of the blade, is as near a general rule as can at this time be suggested. For hard wood a closer pitch of one-third the width is better. The gullet or throat under the tooth should in all cases be circular; not only to guard against breaking or checking in the corners, but to prevent the dust from lodging; as with an acute angle it can be carried in quantities on to the wheels. For the front inclination of the teeth, it should be sufficient, so that when the saw is sharp there will be no back thrust on blades; a thing that must in each case be determined by the observation of the operator, and the character of the timber to be cut.

In the matter of setting, it must be determined by the thickness of the blade and character of the wood. In sawing pine, or other soft woods, the teeth can be bent from the base, and will retain their set; but in hard wood or knots this kind of setting does not last long, but soon "comes out," to use a lumberman's expression. Upsetting the teeth is impracticable with thin saws, or at least is very difficult, unless the plates are No. 14 or thicker. The temper besides is, or ought to be, too high in band saws for upsetting. The best plan of setting developed in the writer's experience, in

band sawing, is a quick abrupt bend on the bottom of the tooth by "sharp blows" from a light hammer—setting the steel, as it were, off to one side and raising a kink of scraping edge on the cutting side of the tooth.

It is easy to get a regular or smooth set in this manner, and it requires no special skill to perform it; it is besides sooner done, no gauge being required. The saw is passed over an anvil, with its top bevelled to a proper angle, the bottom edge of the tooth projecting over the bevel, from the sixteenth to one-eighth of an inch, according to the amount of set required.

These remarks upon teeth relate to saws intended for power or positive speed. For scroll sawing or plain hand slitting it is presumed that no information of any interest could be given, and that none is needed.

[To be Continued.]

Conveying Air Through Pipes.

A Supposed Valuable Invention Explained Away.

We sometime since gave a description of a new device for conveying compressed air through pipes for motive power, whereby it was supposed the friction of the air upon the walls of the tube was done away with. The invention may be substantially described as follows:—

If, in a pipe of twelve inches diameter we make at intervals necks of ten inches in diameter, we have an annular space one inch deep around the inner circumference of the pipe. The theory is that the air contained in this space does not move, but remains at rest, and thus presents an air surface to the moving mass of air ten inches in diameter which flows through the necks. As the friction of air on air is less than that of air on iron, he expects to convey power in the shape of compressed air with almost no loss from friction. The invention is claimed by a Mr. Spear, of Boston, and the marvel was endorsed by William A. Goodwin, "city engineer of Portland, and for some years government lighthouse engineer," who had given the invention a practical trial, and, as he supposed a thorough test as follows:

He set a pressure gauge on a reservoir which received compressed air, and when a pressure of 40 lbs. was indicated, opened an orifice in the reservoir so large as to exhaust the effect of the compressor as fast as delivered. The compressor is now working into the reservoir, the orifice blowing off and the gauge stands at 40. Suppose the orifice to be one inch in diameter. Now attach to the same a pipe of one inch in calibre, say 100 feet long. At a point near the outer end of this pipe set a pressure gauge, and the pressure with the pipe wide open, will be found to be something less than 40 lbs. The element of friction has been developed in the pipe. Now take an additional pipe 1 1/4 inches in diameter; on this find the point where a slight diminution of pressure is indicated by the gauge. Just beyond this point insert a ring of one inch orifice in the pipe, giving a shoulder, all around, of 1/2 inch, and the lost pressure will be found to have been restored.

The reservoir has been virtually moved forward to this point. Repeating the operation at the same distance out from this point as from this to the reservoir produces the same result. Each point or section of the pipe charges the succeeding with original force, and it would seem that there can be no limit to the principle.

And now comes the *Engineer and Mining Journal*, and picks the above-described bubble as follows:

It is true that the pressure in the Spear pipe must be more uniform than in other pipes. He obtains this advantage by presenting not less but more friction to the advancing air. At given distances he contracts his pipe so much, that to force a constant quantity of air through the narrow orifice, the pressure has to increase until it equals that at the compressor. This he puts down as a proof that he has saved power? Had he put a cap on the end of his tube the result would have been the same, that is the pressure would have been equal throughout the closed tube. But in this case he would have economized no power, because the flow of the air would be entirely shut off. The difference between this case of a closed tube and that of a Spear tube, which is a partly closed one, is that in one case the power is entirely shut off, and in the other partially so. In the one case the loss of power is complete, in the other it depends upon the degree to which the power has been shut off.

There is certainly nothing new in the fact that pressure can be maintained at a particular point by partly closing up the tube. Other engineers than Mr. Goodwin have, however, been in the habit of considering that greater pressure is obtained by sacrificing to a certain degree the rapidity of flow, or increasing the motive power.

The *Engineer* further refers Mr. Spear to an instance in which the old principle involved in the contraction of pipes has been put in use, and ingeniously so, in a new blowpipe reservoir described in the *Journal*, in which the flow of air is diminished and the pressure increased, so that a constant blast is obtained, and solely by the use of contracted orifices.

A Three Cylinder Engine.

A three cylinder engine is one of the novelties recently described in the *English mechanical journal*. In this engine three cylinders are disposed round the crank shaft at an angle of one hundred and twenty degrees to each other, each cylinder being provided with a deep but light piston, from which a connecting rod is led to the crank common to all. One of the connecting rods has a single eye at the crank end, while the two other rods are forked at that end, the fork of the one being wide enough to take hold of the pin outside the other, so that the center lines of the rods are all on the same plane. The cylinders are all open at their inner ends, and when the engine is at work the steam from the boiler has free access to the central space, so that it tends to force the three pistons outward uniformly. The admission of the steam to, and its release from, the outer ends of these three cylinders is effected by a single revolving slide valve. This valve works against a face at one side of the central chamber, being carried round with the crank shaft. As there is necessarily some throttling in the steam passages, particularly when the engine is running fast, the pressure of the steam at the outer ends of the cylinders never equals that in the central chamber, and hence the pistons are always forced outward. The strain upon the connecting rods being always a tensile one, but varying in amount according to whether the steam is being admitted to or exhausted from the outer ends of the cylinders.

THE INVENTOR OF THE CIRCULAR SAW.—An exchange says: "The invention of the circular saw is generally attributed to Captain Kendall, of Maine, who died a few weeks ago at the age of 89. This is a mistake. The circular saw was invented by Joseph Murray of Mansfield, England, son of an old servant of the Byron family, whom Lord Byron, the poet, often speaks of in his letters as "Old Joe Murray." The first saw of the kind ever made is still shown by his descendants."

AMERICAN VS. ENGLISH ENGINEERING.—American iron bridges are lighter than those of other nations, but their absolute strength is as great, since the weight which is saved is all dead weight, and not necessary to the solidity of the structure. The same difference is displayed here that is seen in our carriages with their slender wheels, as compared with the lumbering, heavy wagons of European construction.

SCIENTIFIC PROGRESS.

The Road to Scientific Success.

It is no longer possible to know everything. A universal scholar will be no longer seen among men. The range of human knowledge has increased so vastly, has swept out and away so far and so fast, that the brain, in its quantity and quality what it may, cannot, in the years commonly given to man, even survey the field. A man, therefore, must make up his mind, if he propose to learn anything, to be content with profound ignorance of a great many other things. It is a bitter thing, perhaps, but is the fact, that a man who would know anything in this century must purchase his knowledge with voluntary and chosen ignorance of a hundred other things.

One must choose his specialty, and devotion and diligence to the subject of his choice is the price he pays for success. It is with doing it as it is with knowing. There is only a certain amount of work in either case. He can not do everything. Nevertheless, everything needs doing. All about him is undone work clamoring for hands. There are two courses before one. To undertake everything, to fret and grieve because one finds this and that undone, and to make spasmodic efforts to do it—this is the way of failure. Resolutely to make up one's mind to let, as far as he is concerned, the most should be undone, stay undone still, to steel one's heart against demands and necessities, to resist all inducements to put forth a single effort, to close one's eyes to it all, and to stick heart, hand, life, and love to the thing a man undertakes and calls his own—that is the way of success. Life is very short, and the single brain and hand, at best, very weak, and there are thousands of things to know and to do. One must choose, and be content with his choice. And so it comes to pass that now at last the measure of a man's learning will be the amount of his voluntary ignorance, the measure of his practical effectiveness the amount of what he is content to leave unattempted.—*Golden Era*.

SCIENTIFIC PRECISIONS.—A curious illustration of the power of scientific precision in the prediction of matters by no means dependent upon mathematical data, is found in a book on "The Coal Question" in England, published more than seven years ago, by Prof. Stanley Jevons, in which he predicted that the coal consumption of England in 1871 would be 117,900,000 tons. In the volume of mineral statistics of Great Britain for 1871, just published, the actual consumption is set down at 117,352,028 tons.

DARWIN AND AGASSIZ.—Mr. Darwin attempts to prove from the variations of animals in domestication, corresponding variations in a natural or wild state; and on these founds his theory of natural selection.

Prof. Agassiz attributed these variations in domestic animals to the intelligence of man, and holds that physical causes have never been known to produce such effects as the intelligent will of man is known to produce.

However greatly the teachings of these savans may differ in their ultimate results, they both agree that man does exert a very great influence on the animals which come under his immediate care; that animals in domestication do vary, and that man, taking advantage of these variations, does by systematic selection, aided by the great law of inheritance, accumulate in certain families or strains of domestic animals, such qualities of economic value as he may desire. These qualities or peculiar traits become, in the course of years, well established characteristics of the family or breed, and are transmitted from one generation to another with almost unerring certainty. In the language of the declaration "we hold these truths to be self-evident," and while from them Mr. Darwin argues his evolution theory, and Prof. Agassiz eulogizes the human intellect, we may confidently trust them as a safe basis from which to work.

A FLAME ORGAN.—At a meeting of a local scientific body lately held at Ipswich, England, an ingenious device was exhibited, which had been constructed to give a practical exhibition of the musical character of the sounds given out by the burning of hydrogen gas in a tube. This fact was made use of in the gas-flame organ exhibited, in which a series of jets, numbering twenty, burning in tubes of different lengths and proportionate sizes, were made to produce a chromatic scale of notes. Each tube was capped with a valve which was opened by means of a connecting rod attached to a digitarium, and thus beautiful chords could be struck, and simple melodies played at the will of the performer. Owing to the tubes being constructed of glass, the action of the flame could be seen. Mr. Goddard, the inventor and constructor of the instrument, played "Home, Sweet Home," and other familiar airs, and his audience were delighted with the correctness and melody of the music. By means of a long tube, the explosion of the gas bubbles which caused the musical notes was rendered visible; for, just as a lighted stick, if whirled round at a greater rate than the eighth of a second, cannot be followed by the eye in its course, but appears as a ring of light, so the rapidity with which the minute gas explosions followed each other could not be perceived by the ear, the effect being that of continuous notes.

BLUE SKY AND WATER.—*Les Mondes* quotes from M. Collas the following remarkable views: He first refers to the blue color exhibited by the pure water of certain lakes, and says that it is due to the therein dissolved or very minutely divided gelatinous silica, quoting as instances the lake of Geneva, the water of the d'Huile, and more particularly the water of a source near the Mont-Dore which water, seven bluish-colored when placed in a white glass decanter. The blue color of the sky is referred by the author to the same causes, viz., very finely divided gelatinous silica (hydrated silica) kept in suspension in the clouds on account of its great lightness. A correspondent in the *Gas Light Journal* thinks these hypotheses have a plentiful lack of probability. Still no more curious chemical questions exist than those connected with the distribution of silica in soils, waters, etc. As to silica in the air, except as mere dust, that seems really beyond credibility.

IRON IN SALT WATER.—At a meeting of the Polytechnic Association of the American Institute, Mr. W. J. McAlpine said: "It is supposed that cast iron oxidizes rapidly in salt water. I have seen in Europe square piles that had been 47 years in salt water, with the weights marked on them, taken up and broken up, and no appreciable loss had taken place. Even the corners seemed sharp and distinct. Here we see water pipes decomposed; and what is the explanation? One kind of iron will decompose and another will not. Where the carbon and the metallic iron are in intimate chemical combination, it will last 100 or 1,000 years, perhaps. The white or gray iron is incombustible, while the soft foundry iron decomposes readily. I have taken up water pipes that I myself laid 30 years ago, and found them not corroded a particle. I have taken up others, which, as you took up a pipe, broke to pieces."

COAL OIL FUEL IN RUSSIA.—Successful experiments are said to have been recently made in Russia in the use of the products of coal oil for fuel for locomotives. The same fuel has also been applied, with reported satisfactory results, in the propulsion of steamboats. The engineers engaged in the experiments report the accomplishment of more work with this fuel than is obtained from the same value in ordinary fuels.

SCIENCE is studied by the observation of facts. But observation is not easy. It requires more memory and a further perspective than most men possess. Experiment, too, is necessary, which is a series of questions put to Nature, and no witness can be found more difficult to examine.

OUR MINING SHAREHOLDERS' DIRECTORY

NOTE.—In the Stock Boards an assessment is delinquent thirty days from the date of levy, exclusive of the date. The dates given in this list are those of the mining offices.

OTHER COMPANIES (not on the Lists of the Boards.)

Meetings

Name of Co.	Location.	Secretary.	Office in S. F.	Meeting.	Date.
Alhambra Mining Co.		J. O. Stranch.	210 Front street.	Special	Mar. 25
American Flag.	Ely District.	Called by Trustee.	320 California St.	Special	Mar. 27
Alps S. M. Co.	Ely District.	C. S. Neal.	412 Montgomery St.	Annual	Mar. 27
Buckeye & S. M. Co.	Nevada.	J. Maguire.	419 California St.	Annual	Mar. 28
Empire M. & S. Co.	Nevada.	G. R. Kibbe.	419 California St.	Special	Mar. 28
Essex M. Co.	Nevada.	H. C. Kibbe.	419 California St.	Annual	Mar. 28
Hunt G. and S. M. Co.	Nevada.	D. A. Jennings.	401 California st.	Annual	Mar. 28
Ruby Hill Con.	Nevada.	P. W. Van Winkle.	304 California St.	Special	Mar. 28
San Marcial S. Co.	Nevada.	C. F. Matlock.	425 Montgomery St.	Special	Mar. 28
Sierra Pacific M. & Smelting Co.		T. H. Holt.	320 Montgomery St.	Special	Mar. 14
Agatero G. M. Co.		L. Hermann.	422 Montgomery St.	Special	Mar. 14

Latest Dividends.

Name of Co.	Location.	Secretary.	Office in S. F.	Amount.	Payable.
Belcher M. Co.	Washoe.	H. C. Kibbe.	419 California St.	4 00	Mar. 10
Black Diamond Coal Co.	California.	P. B. Cornwall.	Cr. Harrison & Spear.	1/2 per cent	Nov. 11
Cederberg G. M. Co.	California.	D. M. Bokes.	420 Montgomery St.	50c	Feb. 6
Coa. Amador M. Co.	Cal.	F. B. Latham.	401 Montgomery St.	1 00	Mar. 4
Crown Point G. & S. M. Co.	Washoe.	E. Elliot.	418 California St.	3 00	Mar. 12
Elana Co.		N. C. Fasset.	220 Clay St.	1 00	Jan. 20
Rastrop Coos Bay Coal.	Oregon.	J. L. Pool.	Merchants' Ex.	5 00	Mar. 10
Eureka G. M. Co.	Grass Valley.	R. Wegner.	414 California St.	2 00	Mar. 7
Mahogany G. & S. M. Co.	California.	J. Owens.	404 Montgomery St.	4 00	Mar. 7
New Valley M. Co.	Ely District.	T. W. Colburn.	409 California St.	1 50	Jan. 15
Montgomery Belmont M. Co.	Nevada.	B. B. Minor.	411 1/2 California St.	1 60	Feb. 12
Pioche S. M. Co.	Ely Dist. Nev.	C. E. Elliot.	419 California St.	1 00	Aug. 10
Providence G. & S. M. Co.	Ely Dist. Nev.	J. M. Brinkston.	411 California St.	1 00	Nov. 10
Union G. & S. M. Co.	Ely Dist. Nev.	A. J. Moulder.	419 California St.	5 00	Feb. 20

Martin & Co's hydraulic is making the gravel fly from Worth's Hill at a 2:40 rate; quite a face has already been made. The indications are that a good clean-up will be made.

HORSE THIEF.—We have intelligence of a very surprising yield of gold from this mine. A recent cranshing of fifteen tons produced \$750—an average of \$50 per ton. The rock was worked in the anastra connected with the mine. A tunnel 150 ft. in length has been driven on the ledge, which is developing splendidly.

EVERLASTING.—This mine, sometimes called the Scieffard mine, is now turning out each rock as to prove, to the satisfaction of all, its value. The chaft has attained to a depth of 139 ft., with a well-defined lead, of from 9 to 11 ft. in width in the bottom. The rock is very rich, gold being visible to the naked eye in almost

PERTICATO MINE.—Cor. Calaveras Citizen, Mar. 8: The idea of sinking a prospecting shaft on a quartz mine 500 or 600 ft. distant from where the principal deposit of pay-ore is known to exist, and be compelled to drive levee hundreds of feet to intercept the "ore-chimneys" every piece. It is the opinion of experts that the rock now being taken out will mill at least \$40 per ton. That which has already been worked, though quite inferior to that at present obtained, went from \$10 to \$22.50 per ton.

hundreds of feet to intercept the "ore-chimneys," at an expense of thousands of dollars, is idiotic in the extreme. There are several paying "chimneys" in the Petticoat, all of which show a decided northward dip; the most extensive is the one known as the "Whim Shaft" that has yielded seven-eighths of the bullion taken from the mine, and is the farthest north from the present working shaft. In fact, all the pay is north, consequently the deeper the shaft, the

[S. F. Stock and Exchange Board.]

THURSDAY EVENING, March 13, 1873.

This week has been a hard one among the brokers, as mining stocks have been lower and lower day by day for some time, and this week were worse than ever. It does not make any difference whether the mines are dividend paying or not, they are all in the same boat, all extremely low. For instance, the production of the Crown Point and Belcher for the first week of this month if continued will amount in a year to \$2,000,000 more than the whole production of Nevada was last year. Belcher turned out 3,128 tons, averaging \$70 per ton or \$218,750 for the week ending March 7th, and Crown Point produced 3,564 tons, averaging \$68.25 per ton or \$243,611. This combined production is equal to \$24,000,000 per annum. Nevertheless the Stock is much lower proportionately than last year. The *Alta* makes up a table, which shows the shrinkage of Stocks during the past month in 14 mines on the Comstock lode to have been \$6,559,600.

The product of the Crown Point mine for February was \$783,820 and that of the Belcher was \$728,000. The Chollar Potosi turned out \$83,797 during the month. The number of tons of ore worked at the Crown Point mills in February was 12,646 tons, averaging \$61.98. The disbursements were \$259,800; receipts, \$783,820; net profit, \$524,000.

The gross receipts of the Belcher were \$728,000; expenses, \$220,000; net profit, \$508,000. The dividend of \$3 declared on the 5th was increased on the 7th inst., to \$4, payable on the 10th. When the \$3 dividend was declared the receipts for the month were \$654,000; the final clean-up showing \$728,000, it was increased. The dividend therefore amounts to \$416,000, and leaves \$90,000 added to the surplus. Crown Point pays \$3 per share or \$300,000.

On Friday the market was dull and weak, in the morning, but livened up a little in the afternoon, though prices were lower. Gould & Curry fell \$1; Hale & Norcross, \$1; Ophir, \$2; Overman, \$4; Raymond & Ely, \$1. The improved reports of Con. Virginia raised the price \$4.

Saturday, prices were weak and showed a decline at close. Belcher, \$1; Crown Point, \$1; Con. Virginia, \$3; Hale & Norcross, \$7; Jacket, \$6; Savage, \$5; Overman, \$3. Chollar was \$2 higher.

Monday the market was very heavy and prices generally were much lower than on Saturday. As compared with Saturday, Belcher was \$3 lower, selling at \$62 dividend (\$4) off; Crown Point fell \$3; Con. Virginia, 3; Gould & Curry, \$1; Hale & Norcross, \$3; Imperial, 62½ cents; Kentucky, \$1; Meadow Valley, \$1; Ophir, \$7; Savage, \$7. Yellow Jacket was about the same as on Saturday.

Tuesday the downward course continued and prices were extremely low. Wednesday the Stock Market recovered slightly under the reaction caused by low prices and Crown Point and Belcher particularly were in demand. Crown Point was more firm, closing \$91 dis-

dend, \$3, off, being an advance of \$4 over the previous day. Con. Virginia rose \$1.50; Ophir 4; Savage, \$5; Overman, \$5; Hale & Norcross, \$5; Imperial, \$1; Raymond & Ely, \$2.

To-day there was no improvement in the market everything showing a decline, as our Stock tables will show.

MINING SUMMARY.

THE following is mostly condensed from journals published in the interior, in proximity to the mines mentioned:

California.

ALPINE COUNTY.
GLOBE.—*Alpine Miner*, March 8: Work on the south drift from main tunnel of this mine was resumed this week and is, we understand, to be pushed forward under the chimney known to be in that direction without interruption.

GLANCE SHAFT is now going down below the 75 ft. level—from which drifts were run—in order to test still further the value of depth in discovering improvement in quantity and quality of ore.

CALAVERAS COUNTY.

MosQUITO DISTRICT. — Calaveras *Chronicle*, March 8: Levels are being run in the Dolly Varden at the depth of 100 ft. The vein is large and prospects well. The Cuba, first east extension of the Dolly Varden, shows fine indications equal to the original discovery. New hoisting works will be erected on the main shaft of the Good Hope as soon as practicable. A steam engine will furnish the motive power. The Good Hope mill is crushing ore from the Monte Cristo, at present; some of the ore is very rich. A 10 inch vein has been discovered near the Valentine; the ore is said to be worth \$50 per ton.

WEST POINT DISTRICT.—The ore in bottom of shaft is 20 inches thick and worth in the neighborhood of \$60 per ton. A rich discovery was made this week, a short distance west of those mines. The ore is about 1 ft. thick and every portion of it shows gold pretty lively. A cross drift is being run in the Lone Star to ascertain the width of the vein. Drift in 16 ft. and no footwall to be seen; the ore shows gold freely.

CENTRAL HILL ITEMS.—Work at the Hudson is being pushed forward with vigor. The contractors for sinking the shaft 100 ft. deeper are making great headway. So far the show of having a mine is good. A prospect tunnel is being run on the east side of the hill which will tap the lead at a considerable depth.

Peter Davis' hydraulic claim is in full operation, and at present he is busily piping away at the surface in order to clear a rim of cement which can then be worked off to better advantage. The ground pays moderately well.

and better as they go down, and we are confident that a large amount of rock could be selected from that now being taken out that would go from \$75 to \$100 to the ton.

GRANITE TUNNEL.—The tunnel of this mine is completed to the bed rock of the deep channel. It runs in on an easy incline 150 ft., where a fine bed of gravel is developed. This well undoubtedly prove to be one of the best gravel claims in the county. It has been thoroughly prospected and ascertained to a certainty that there is not only an immense rich gravel bed lying upon the bed rock, from 80 to 150 ft. in depth, but that the bench above it, which is composed of gravel cement, will pay well for working. One great advantage in the mine is that every portion of it can be thoroughly drained at little expense.

ANOTHER SLENDID "FIND."—Placerville Democrat, March 8: Last Thursday our eyes were dazzled by a wonderfully rich display of specimen quartz from Mosquito Cañon. It was found by Carpenter & Co., who brought into town about 300 pounds, of which some specimens, larger than a man's fist contained about equal parts of gold and quartz. One chunk had been completely shattered, and the scores of detached pieces of quartz were held together by bright plates of gold very similar to some of the finest specimens from the Cederberg.

KERN COUNTY.

SUMMER.—Havilah Miner, March 8: This is now one of the best opened mines on the lower coast; it can now be denominated the leading mine of Kern. The 16 stamps are kept in constant action night and day, ponding away at the mine rock; more of which is extracted from the mine than the stamps can crush. The shaft is down about 150 ft., and the vein is gradually enlarging.

NAPA COUNTY.

QUICKSILVER DISCOVERY.—Napa Register, March 8: Mr. J. C. Rice, on last Sunday the 2d inst., discovered a lead of cinnabar near the residence of Mr. Schram, about 5 or 6 miles northwest of St. Helena. Mr. Rice says he first knew of this lead 16 years ago, but has been absent from this part of the country for several years. Some splendid specimens have been brought in from the lead, and a company formed for the purpose of developing the mine.

NEVADA COUNTY.

EMPIRE.—Graess Valley Union, March 7: The Empire is doing well, as we said the other day. For 24 days of last month the mill yielded about \$12,000 with its 20 stamps. This includes sulphurets and clean gold. The gold shipped yesterday was valued at \$11,000.

DABS OF GOLD.—March 12: The Idaho mill's amalgamators were skimmed last Saturday, after the six day's run, and the sum of \$22,000 cleaned up. The batteries were not touched. The Eureka cleaned up \$11,900 for six day's run, with ten stamps, and not \$17,000 as was stated.

PLACER COUNTY.

RICH MINE SOLD.—Placer Herald, March 8: Some weeks ago we announced the discovery of a rich mine near Temperance Flat, some three miles northwest of here. The specimens we examined and found them very rich. Two parallel ledges were located by the discoverers, running for 600 ft. each, and the work of development commenced. Last week some gentlemen from Woodland visited the mine, and early this week thought the whole location for a consideration named in the deed as \$10,000, which includes part of the specimens and an obligation to do \$500 worth of work in the opening of the "Wizard" mine, which lies near the "Miner," as the rich lead is named. Messrs. Bynum, Griffith Lee and Colonel Harper, of Woodland, are purchasers, and will proceed to develop the "Miner" without loss of time. The ledge lies in a district that has been very rich in specimens and coarse gold in the surface diggings, and probably is one of the feeders of those rich surface mines.

SIERRA COUNTY.

PORT WINE.—Cor. of Downieville Messenger, March 8: The claims are all being vigorously worked at Grass Flat, the Slope, the Queen, and this place. When the snow begins to melt, and the boys get to washing their pay dirt that has been accumulating for several months past we may begin to look out for lively times again in northern Sierra.

BALD MOUNTAIN.—This M. Co. have their dump shed full of dirt, but no water to wash. They are working their men on part time to keep along until water comes. There will be a great demand for hands in this county when spring opens.

MINING SUIT.—On the 1st of September, Samuel Tyler, by his attorney, C. M. Tyler, gave Victor Noly a promissory note of that date payable in six months, for \$4,160, with interest; the consideration was the transfer by Noly to Samuel Tyler of the Rocky Bar Quartz Mine. The contract or agreement for the purchase and sale of the mine was subsequently not carried out. Tyler refusing to pay Noly the amount of the note. The latter commenced suit to enforce payment. The defendants filed an answer and cross-complaint, in which the giving of the note is admitted; but they maintain that it is null and void, by reason of fraud and fraudulent representations in obtaining it; that the note was given for and on account of the sale of the Rocky Bar Quartz mine, near Murphy's, in the county of Calaveras, which plaintiff represented to, and assemed the defendants that the mine was rich in mineral-bearing gold rock, which would yield at least \$20 to the ton, and upon these representations the note was given;

that said mine was utterly valueless; that the defendants erected extensive machinery to work the mine, at a cost of \$10,000, and paid \$5,000 in working the mine, and that the yield was not more than \$4 per ton. The plaintiff is now and has been ready to recover back the mine. The answer demands judgment for \$15,000 damages and costs. The case will be tried next Monday.

TUOLUMNE COUNTY.

HIDDEN TREASURES AT CHEROKEE.—Tuolumne Independent, March 8: This mine is situated near the rich district of Cherokee. Their shaft is 40 ft. deep and they have run on the lead north and south 100 ft. The vein is from 8 to 15 inches wide, and mostly in chutes up and down. The ore has been prospected \$40 per ton in assays, and the owner is so well satisfied with his bargain that he has concluded to erect a five stamp portable water mill, which will probably be in operation by the first week in April.

Nevada.

ELY DISTRICT.

RAYMOND & ELY.—Pioche Record, March 2: It is estimated that 100 tons a day are now being delivered for reduction.

CHIEF OF THE HILL.—The main shaft had attained a depth of 167 ft. up to yesterday morning, 150 of which are substantially timbered. A good quantity of \$140 ore is being hoisted daily.

PORTLAND.—By the end of the present month if the Co. meet with no bad luck, connection will be made between the winze and the main shaft at a depth below the surface of 200 ft. The ledge looks well throughout and has every appearance of being a true fissure vein.

STANDARD.—The vein is well defined throughout the entire mine, and has every indication of being permanent. A large quantity of ore has been taken from the bottom of the shaft assaying over \$200 to the ton.

ALPS.—The Alps has been doing nobly. This week it sent out bullion to the amount of \$6,447.35. There is still a large supply of first-class ore at the dump and the usual amount is being hoisted daily.

HORN & HUNT.—Vast quantities of ore continue to be hoisted—much more than, in the present state of the roads, can be hauled to the mill.

AMADOR TUNNEL.—An immense amount of ore is being run through the tunnel, much being of the high-grade class.

PROSPECT.—Usual quantity of ore being hoisted, and a new section being started at the dump-piles, it being impossible to have the ore taken to the mill as fast as brought to the surface.

SILVER PEAK.—T. R. Butler yesterday returned his certificate of two assays, representing high and low-grade ores. The former assays \$100.53, and the latter \$72.20, to the ton.

PACIFIC TUNNEL.—A contract has been let to drive the tunnel in 100 ft. further, and when this is done it is the intention of the company to immediately let another contract.

STAR OF THE UNION.—This ledge continues to show increased vein body and high-grade ore.

MEADOW VALLEY.—Some difficulty has been experienced in getting ore hauled to the mills, and there is a tremendous quantity of ore at the dumps, of all grades.

CHIEF EAST EX.—The ledge has improved much in the bottom of the shaft the last week. There is rich ore on both the foot-wall and the hanging wall, and the vein is widening as sinking progresses.

NEW DISCOVERIES IN BRISTOL DISTRICT.—March 7: Very rich discoveries have been lately made in Bristol district, equaling if not surpassing in assay of ore and width of vein the best mines now in progress of development.

LEXINGTON DISTRICT.—We yesterday had an interview with a miner just down from Lexington District, which is about 80 miles a little east of north from Pioche—the western boundary of Utah running through it, and Sacramento District joining it on the west. Developments have not recently commenced in Lexington District, but the ledges have been sufficiently tested to justify the opinion that it will become an important camp. Shafts are being sunk on seven different claims, about 150 miners being engaged. The ores are of the milling class, carrying a percentage of gold, and with the splendid natural working facilities there at hand, good pay is expected in mining and reducing them. Wood and water are abundant, and there are tracts of good farming land contiguous.

ELKO COUNTY.

SPRUE MOUNTAIN MINES.—Cor. Utah Mining Journal, March 5: The Monarch has a shaft down about 100 ft., the mine looking well, and considerable ore on the dump of very good grade. I think it will average \$80 per ton. In a northerly direction, about 1 mile, is the Badger mine. It has a shaft of 150 ft. of tunnel and a shaft about 75 ft. in depth, showing a large vein or deposit of carbonate and galena ore. They have 150 or 200 tons on the dump, but the grade is not very high—it will probably average \$30 to \$40 per ton.

In an easterly direction, about 1/2 of a mile, is the Latham. This mine is owned by the Ingot Company. They paid \$30,000 for it in October, 1871. They have several hundred ft. of tunnel and a shaft 108 ft. deep. There are immense bodies of ore developed. It is rather low grade, but will average \$25 or \$30 per ton.

About half a mile southeast is the Fourth-of-July mine, which is owned by the same Co., they having purchased it for \$50,000. This mine has been developed by a tunnel about 250 ft. in length. It shows vast bodies of ore in large caves. The ore is of very good grade, and will probably average \$70 per ton.

One-half a mile east of the Latham we come to the Black Forest Mine; the owners have run 4 tunnels for a distance of 150 ft. in length, developing the vein for a distance of 150 ft. in length, each. Each one of these tunnels struck large bodies of rich ore, from 4 to 12 ft. wide. It is the finest-looking ore I have seen on the mountain, and is high grade. The lowest assay they have had is \$86 and up to \$236 per ton. It will probably average \$200 per ton in silver and about 50 per cent. lead. It is considered by experts to be the best mine on the mountain.

HUMBOLDT.

COPPER.—Reese River Revue, March 8: Judge McKenny received a letter from Bolivi District. Mine developments have been made by Messrs. Kellogg & Co., in that country, where they have sunk a shaft 28 ft. deep in iron croppings which appear to be iron, but before reaching the depth above mentioned a splendid vein of copper 4 ft. thick, enclosed in solid walls, developed itself. They were led to sink on these supposed iron croppings by the advice of Mr. George Hearst, who visited the district a couple of months since and gave it as his opinion that the ore would be a splendid copper mine. The result has verified his prophecy.

A RICH STRIKE.—Silver State, March 8: A fine body of ore was struck in the lower level of the Manitowish mine, on last Thursday. The ledge is 5 ft. wide, and the ore principally "shipping," worth from \$300 to \$500 per ton. We have been shown a large-sized specimen of the ore, which is literally coated with native silver.

WASHOE.

HALE & NOBLOESS.—Gold Hill News, March 8: The ore body recently developed by the southeast drift at the 800-ft. level is yielding 60 tons of good milling ore per day, increasing the daily yield to 200 tons.

BELOCH.—Yielding about the same as at last report,

with no change to note in any of the ore-producing levels. The 1,300 ft. level opens out thus far richer and better than any above, and the farther south it is worked the more extensive is the ore-body found to be. The yield for last month was about \$750,000, of which over \$500,000 is clear profit.

GOLD & COPPER.—Sinking the incline has made fair progress during the past week, although the striking of a strong vein of hot water in the bottom has somewhat impeded the work. Prospecting on the other levels continues as usual, with no change of interest to chronicle.

CHOLLAR-POTOSI.—But little ore has been extracted from this mine since our last report, the ore dumps being all not and it being impossible to get the ore hauled to the mills. The main north drift at the fourth station last Tuesday tapped a heavy body of water, which has stopped all work in the drift for the present, and which keeps the pump constantly at work to drain the supply.

SAYAGE.—The daily yield of ore is about 50 tons, the assay value of which is about \$20 per ton, extracted mostly from the old upper works and the 1,300 and 1,400-ft. levels.

SIERRA NEVADA.—Daily yield, 95 tons of good milling ore.

GUVERMAN.—The main west drift at the 1,000-ft. level, has made excellent progress during the week. There is quite an increase of water from the face of the drift, although not enough to impede the progress of the work. The flow of water in the shaft is steadily decreasing.

CON. VICTORIA.—About 25 tons of ore per day are being hoisted from this level, and the indications of a large and permanent body are certainly very flattering.

WOONVILLE.—The winze from the first station is down 20 ft., the pay ore body showing 3 ft. in width of 400 milling ore. The rock at the third station is up 15 ft. the rock working well and the ledge showing 2 ft. in width of good ore. The face of the south drift at the third station is in 102 ft., the ledge showing finely, nearly the whole width of the face in good ore.

MINT.—The ore encountered in the southeast corner of the shaft, at the time the body of water was struck and work stopped a few weeks since, has proved to be a good spur of the main ledge, which the shaft has passed through and is again in porphyry.

YELLOW JACKET.—The main drift east at the 1,500-ft. level has cut through the west wall and considerable quartz is met with, giving low assays. Not far enough in as yet for good ore bodies. At the 1,400-ft. level the main drift is cut, and the drift north of it is in 75 ft. in fine looking quartz, which gives low assays.

CROWN POINT.—Looking finely as usual at all points and keeping up its immense daily yield. The yield of the mine for February was \$733,820 72, of which \$570,000 is estimated to be the net earnings for the month.

NEVADA.—The south drift from the main west tunnel is in 125 ft., having cut through the chimney of ore men, and is in clear rock. This chimney of ore prospects well, bidding fair to develop a fine and permanent body.

NEW YORK CO.—Work was again resumed on this claim last Monday. The heavy body of water in the shaft has been drained and sinking the shaft was resumed last evening.

SILVER CLOUD.—The incline from the bottom of the winze is down to the depth showing well. The drift from the second station is in 15 ft., cutting the ledge—which shows a compact body of good ore.

BUCKEYE.—The average assay of ore being extracted is about \$23 per ton. Rock hard and considerable water to contend with.

BALTIMORE CO.—The main west drift at the 250-ft. station has made good headway during the week, the face of the drift in a mixture of quartz, porphyry and clay.

LEE.—The ore body in this mine is about 8 ft. wide and of a gypsum character, yet rather hard, requiring blasting. It assays all the way from \$50 to \$1,000 per ton, with little or no waste rock.

ALAMO.—Sinking the shaft is making excellent progress, almost the entire size of the shaft being in good ore.

SURMO TUNNEL.—Total length, 3,685 ft. The rock in the face is very hard, but good work is done. Very little water.

GLOBE.—The raise from the main drift is up 60 ft., showing good ore almost the entire distance.

WHITE PINE.

ESGAR SHAFT.—White Pine News, March 8: This shaft has been sunk perpendicularly a distance of 155 ft., and at that depth a vein of ore has been struck, which is being followed east or into the hill. We know from ocular demonstration that the strike is one of no mean importance, and is calculated to show that a vein of ore exists, running parallel with the mines of Eberhardt & Aurora.

EBERHARDT & AURORA CO.—Entering at the old Earl shaft, originally one of the richest prospects on the Hill, we passed through the Earl Chamber, from whence hundreds of tons of rich ore have been extracted, to the Ladies' Chamber, which is 154 ft. from the surface, and discloses a vaulted chamber 64 ft. in height and 100 ft. square. From this remarkable chamber, thousands of tons of rich ore have been excavated and sent to the mills, and the end is not yet. Far from it; as on every hand, above, below, and underneath, can still be seen the choicest quality of paying rock. The extent of the vein or deposit has been developed in the end of this chamber to the width of 100 ft. The line of ore runs due north and south, and from the Earl Chamber, ranges from 10 to 100 ft. in width. Passing from the Ladies' Chamber, we traverse a cut run south 150 ft. in pay ore, some of which we picked out as samples. Mr. Potts informed us that from this chamber he commenced a drift toward the north Aurora shaft, with the intention of making a connection to facilitate the raising of ore to the surface at less expense, and at 150 ft. from the point of departure, ore was struck on the night of the 26th of last month. We saw the strike, and are satisfied of its richness and extent.

NORTH AURORA.—Work has progressed on the main shaft of this mine to a depth of 213 ft., large quantities of ore having been found in the interim, and culminating in the Peerless Chamber. A personal and careful inspection has confirmed us in the belief formerly expressed as to its extent and richness. Passing from this chamber we proceed by way of a tunnel cut in solid limestone, with here and there a bunch of mineral, to the outlet where is situated the ore house, blacksmith shop, and machinery for working the tramway. In the ore house we saw 400 tons of assorted rock, ready for shipment to the mill.

Arizona.

LOCAL MINING OPERATIONS.—Arizona Citizen, March 1: Some months ago D. A. Bennett, Thomas Hughes and others leased the steam works of the Santa Rita Smelter Co., moved them into the Patagonia mountains and we will endeavor to give a report of the progress of their extensive mining business in taking out and smelting ore. This movement was taken in the belief that the Apache would permit work to be continued there, and thus far they have done so. This new start over that way for the first time in over 5 years, emboldened others to explore that region so well known to be full of mineral wealth, until now as per report of Mr. Bennett, more than 200 men are exploring for or developing mines already found there.

A Co. propose to erect reducing works on the upper San Pedro and open up and work a mine near the stream. For this purpose we understand an order has been sent to San Francisco for machinery. Parties are developing several mines about 35 miles to the southwest of Tucson. Judged by return received of samples tested in San Francisco, they are confident of being able to make a profit by shipping the ore to Yuma by wagons and thence by steamer to San Francisco, for sale. This class of ore we are told is abundant.

Some 30 odd miles westward from Tucson 3 men are

working on mines with very encouraging prospects. Considerable of the ore contains enough gold to enable a man to make from \$2 to \$2.50 per day with a hand mortar, and that they intend to construct arrastras very soon. Water seems to be plentiful within a few feet of the surface and some springs are near by, and the country about is in excellent pasturage. A vein of white marble is also reported to extend for many miles in this section.

QUARTZ MINING.—Arizona Miner, March 1: The Del Pasco mill and arrastra, Mr. Pointer's arrastra, on Lynx Creek, Mr. Cullumber's small mill at Walnut Grove and many other "machines" are now running or soon will be so that we confidently look for a yield of from \$3,000 to \$4,000 per day from this on.

Parties are plying in their hydraulic claims on lower Lynx Creek, taking out not less than \$200 per day.

YUMA COUNTY.—Work on the Constantia will soon be renewed, under a new Superintendent. The mill is one of the best on the coast.

Idaho.

RED JACKET.—Owyhee Avalanche, Feb. 22: There is now a splendid exhibit about the rich strike in this mine. After running the adit level 600 ft. they came apparently to the end of the vein, but drifting about 20 ft. west, they struck it again, and are now running north, with about 250 ft. to run in order to reach the north shaft which is 90 ft. deep. This will give a continuous body of ore, 850 ft. in length, with 250 ft. of backs. This rich body of ore contains a 34-vein, and is now 20 ft. wide, increasing in richness and size as they go down. It is wonderful to behold. By the light of a candle, free gold and pure silver can be seen sparkling through it everywhere. Mr. Miller has made a milling test of 30 pounds of the ore, which yielded at the rate of \$1,500 per ton.

IDA ELK MOUNT.—The prospects of this mine are favorable. The drift is in about 60 ft. on a vein from 4 to 5 ft. in width of high grade ore.

GOLDEN CHARIOT.—The prospects of this mine are encouraging. At present the mine is yielding about 8 tons of ore per day.

ILLINOIS CENTRAL.—This mine continues to yield a rich quality of ore.

BELLE PECK.—Mr. Peck is still prospecting his mine favorable results. He has proved the rich chimney to extend over 100 ft. in length, and has 25 tons of ore on the dump which he thinks will mill upwards of \$100 per ton.

WAR EAGLE.—Nothing doing in this mine at present.

MARSHALL.—Richer than ever in the 6th level south, and shipping a large amount of ore to the land, and striking it richer and more extensive than ever.

Montana.

GOLD CANON.—Cor. New North West, Feb. 22: There are two companies working here this winter, but with result is not known. Jones & Co., struck a very rich deposit of gravel in the claim, from 12 to 15 ft. thick, which will pay from \$25 to \$50 per day to the land, and there is ground enough to last them for a number of years. Williams & Co., are taking out pay dirt with very flattering prospects.

BUTTE MINES.—March 1: A gentleman from Butte has handed us some splendid samples of ore which Mr. Gilchrist is now taking out of the Parrott lead, the rock and crevice showing better than ever before. The lead which was struck at one place to 4 inches has widened out and continues to widen regularly at the depth of 110 ft. to which depth the shaft is now sunk. The samples handed us are very rich in born silver and copper. Our informant says the bottom of the shaft for ten feet glitters with silver as the light is passed along it. Six men are at work in the shaft, but no working at once disd—

Some parties are getting out ore on the Moscow, but the snow which is 3 ft. deep on the hills above Butte, prevents considerable representation and development that would otherwise be done.

Utah.

RIOB STRIKE.—Utah Mining Journal, March 6: We have just been shown a five-ounce specimen of horn silver taken from the Lion Hill, Gphir District, which assayed \$27,000 to the ton. It was a beauty. The shaft in the mine is down about 50 ft. and a rich 4 ft. lead is opened. \$300,000 has already been offered and refused.

New Incorporations.

The following companies have filed certificates of incorporation at the County Clerk's Office in this city:

BELLE ALLEN MINING CO.—March 8. Capital, \$300,000. Object, to carry on business in Sierra county, California.

SPRING VALLEY CANAL AND MINING CO.—March 8. This company filed a certificate of increase of stock from \$600,000, in 1,200 shares of \$500 each, to \$4,000,000, in 40,000 shares of \$100 each. The present assets of the company are \$515,000 in gold coin, and its debts are \$86,000.

WISLA STAR CONSOLIDATED MILL AND MINING CO.—March 8. Capital, \$500,000. Object, to carry on a general mining and milling business in East Tintic District, Juab county, Utah Territory.

Articles of incorporation of the Santa Rosa (Sonoma county) Savings Bank were filed in the office of the Secretary of State at Sacramento March 10th. Capital, \$100,000.

THE RISING STAR CONSOLIDATED MILL AND MINING COMPANY.—March 8. Location: East Tintic Mining District, Juab county, Utah. Capital, \$500,000, divided into 50,000 shares. Trustees: A. Albertson, J. M. Case, W. LeRoy, Thomas Rogers, G. A. Miller, E. J. Elzy, W. F. Sherwood.

THE SILVER PEAK MINING CO. have elected the following Trustees: A. J. Bryant, C. W. Rand, O. E. Elliott, W. H. Sears and J. W. Martin.

The annual meeting of the Almaden Quicksilver Mining Company took place in New York on the 26th ultimo. The total product for 1872 was 18,572 flasks. During the first three months this product was sold under a previous contract for \$31 per flask, and subsequently at \$50.50, the total realizing \$937,886, while the net profits for the year, including rents, were \$451,759. The expenses of the year embraced \$100,000 for tunneling and prospecting. There is no floating debt, and the assets include \$480,000 in cash and quicksilver and supplies to the value of \$115,000. The following persons were elected Directors for the ensuing year: Daniel Drew (President), James S. Thayer, James H. Banker, A. B. Baylis, E. D. Stanton, E. N. Robinson (Treasurer), Eugene Kelly, Edwin Hoyt, George G. Fride, Ludlow Patton and James D. Smith. David Mahoney was chosen Secretary.

THE WOODBURN WHEEL FACTORY at Indianapolis, the largest establishment of its kind in the United States, was destroyed by fire on the 12th inst.

A Chapter on Rats.

Whosoever man goes the rat follows or accompanies him. Town or country are equally agreeable to him. He is a most enterprising traveler, and is continually passing from one country to another. Scarcely a ship leaves a port, without taking on board its complement of rats for the voyage. It is thus that this destructive little rodent has distributed himself over the entire civilized world. These remarks apply more particularly to the brown or Norway rat.

Although called the Norway rat, this variety of rodents did not originate in that country, but came from the warm regions of Central Asia. It seems to have taken up its migratory habits about the time of the revival of commerce, near the year 1700. It found its way into southeastern Europe in the early part of that century, where, after multiplying largely, it commenced a northward march into Russia, crossing the Volga in large troops. It reached England in 1730, and France in 1750.

In its march through Europe it drove before it or exterminated the black rat—the native house rat of that continent. In 1775 it "took ship" and crossed the ocean to America, whither it had been preceded by the black rat a few years before; and here also it soon exterminated its black congener, and has reigned since master of the cellar and the sewer.

In unsettled countries the black rat is wild and lives in the woods; but does not multiply rapidly; while in civilized countries it generally avoids the fields and woods, conforms itself to the customs of civilization—dwelling in artificial homes. Both these varieties enter your house, a tenant at will—their will, not yours—shares in your food, and holds nightly revels with the belles of rat-land, in the innermost recesses of your dwelling. Their sagacity in securing food and avoiding detection is most wonderful. In this respect they approach nearer to certain classes of the human species than any other animals.

The black rat is much more timid than the brown, and dislikes burrowing. He prefers the upper parts of dwellings to cellars or any low, filthy places. He is the aristocrat of the rat tribe; is less gregarious than others, and travels in small, select parties. Of course he is not a fighting character. On the contrary, the brown rat is very ferocious, fights and travels in large companies, and pursues war to the death against his enemies.

Our illustration presents a view of a lively combat between a party of brown and black rats—the latter having evidently been surprised at a convivial entertainment in the corn crib of some Western farmer. Their mode of battle and quick dispatch has been vividly portrayed by our artist.

The black rat never found its way to California—his race, on this continent, was cut short by the break in human habitations in the "far West" of the Atlantic States, where his "forlorn hope," as an advance guard, was overtaken by the vindictive pursuit of his ancient enemy.

The early residents of San Francisco say that the old Mission and the early dwellings in the city proper, were occupied by a variety of white rats; but as no specimens have ever been noticed by our scientists, the inference is that the "white rats" were nothing more than a variety of the brown, which, at that time, had been but sparsely introduced by transient

ships coming to this Coast with supplies for the early Jesuit missionary settlements, and stopping to gather hides for a return cargo. This supposition gathers strength from the fact that the brown rat is prone to exhibit this variation of color, whenever it becomes isolated, or for any reason ceases to multiply rapidly—a condition that was well fulfilled during the period anterior to the advent of the gold-hunters, when civilized habitations were so scarce here, and because that aristocratic variety of the rat family is extremely loth to remain with dwellers in huts.

The predominating native rat on this Coast is the *Mus Californicus*,—commonly known as the short-tailed rat,—a variety of the wood rat, which, from the disinclination of the brown rat to follow into outlying bushes or woods, never has, and probably never will be exterminated by the new-comer. This rat, consequently, is still found in great abundance, especially all along the Coast Range, both in mountain and valley, where it builds mounds of sticks, leaves, etc., often ten feet in height and twenty in diameter at the base. These mounds serve as convenient retreats for the rodents from their natural enemies, and their elevation above the surface of the earth fur-

Silk in the United States.

It is gratifying to learn that one of the most important manufacturing interests of the more industrial nations of Europe, is also steadily and advantageously gaining ground in our own country; we allude to the manufacture of silken goods. A cotemporary chronicles the following facts and figures in relation thereto, but omits to tell us that the raw silk from which these fabrics are wrought, are obtained almost entirely from foreign countries where cheap labor is the rule.

The silk interest has grown in the last few years much beyond what has been generally supposed. A report issued by the silk manufacturers of America states that the growth of this production is steadily increasing. Within a decade it has sprung from an insignificant and unpromising experiment, and now bids fair to become one of the lucrative branches of our varied industry.

There is said to be at this time a capital of over \$30,000,000 invested in the business in this country, against less than \$3,000,000 in 1860. Sixteen thousand operatives are employed, earning \$8,000,000 per annum, and weaving between \$30,000,000 and \$40,000,000

Singular Discovery of Gold.

A gentleman informs the Nevada Transcript of a most singular discovery of a piece of gold, at Red Hill, about a mile from this city. He says one of the owners of the land was walking by a piece of ground, a few days ago, where the top dirt had been washed off to the depth of about five feet, and saw something shining. He went to the spot, and ascertaining it was gold, took out a piece weighing about three ounces. Informing his partner of the discovery, they supplied themselves with tools, and returned to the spot where the three-ounce specimen was found, and proceeded to clear the clay away for a distance of two and a half feet in length and nearly two feet in width, which was as far as the gold could be traced. The gold lay nearly flat the whole of this distance and on the bed rock. If it had been melted and poured out it could not have been so nicely laid as it was there. Some portions of it was as thin as a wafer, and none of it thicker than a twenty-dollar gold piece. Our informant says if it had been taken out as he saw it, it would have been the most beautiful specimen ever exhibited in the world. The owners on seeing the sight became excited and anxious to ascertain the result of their discovery commenced picking it out every way, thus spoiling the beautiful specimen. Its appearance seemed to indicate, at first sight; that it was a massive boulder of gold, and on the surface it looked as though there was a block of gold worth millions of dollars. They dug it out in pieces of various sizes, and the total value of the gold was \$3,000. The most singular part of it was, there was no quartz in it, although the hill is full of quartz.

Some people may think that this was a "salting process," in order to effect a sale for a large sum of money. But we know that such is not the case, as the ground in that locality is not for sale. Furthermore, many such pockets have been found on Red Hill, one of which, discovered many years ago, yielded over \$7,000, and others varying from \$50 to \$1,000. As a rule, these "pocket claims" are not remunerative, from the fact that when a "pocket" is struck, miner's will often spend twice as much as the amount taken out in trying to find another, and then be disappointed; and Red Hill is not an exception. Large amounts of money have been taken out of this hill, and a great deal been spent in prospecting. But we think

the time not far distant when it will be demonstrated that one of the richest quartz ledges in the country runs through Red Hill, which when developed, will add greatly to the wealth of Nevada county. All through the hill floating quartz and spurs may be found, and as the famous Schmitt ledge is close to and runs in that direction, there is good reason for the belief that Red Hill will yet be made to unseal her hidden treasures, and reward the faithful prospector for his untiring energy.

ASSAYING LEAD ORES.—Previous to reducing the galena or other lead ore to the metallic state, A. Mascazzini converts the lead present in the ore into sulphate, by igniting it in a porcelain crucible with sulphate of ammonia, after which the ore is treated in the usual manner. The flux preferred by the author is that recommended by Plattner, consisting of 13 parts of carbonate of potassa; 10 of dry carbonate of soda; 5 of previously fused borax; and five of well dried starch.

ANTI-SEA-SICK CABINS.—The famous Bessemer ship has encountered a rival in the floating cabin devised by a Russian. The construction is very much the same as that of the Bessemer but the cabin instead of being attached to a pivot, literally floats amidships between the engines. The invention has been tested by the Grand Duke Constantine, and is deemed successful.

SOUTH BEND, Indiana, claims 150 industrial establishments, employing 2,100 workmen, and turning out an annual product of \$5,000,000, or \$500 to each inhabitant of the town. Its buildings erected in 1872 cost \$1,300,000.



THE BATTLE OF THE RATS.

nishes a safe retreat in case of overflow.

The omnipresent brown rat, however, has driven this native well out of all the city and village sites, and, for the last two decades, has made itself unpleasantly abundant, wherever, throughout the Pacific Coast, the Anglo Saxon has planted his homestead.

NITRATE OF SODA.—The following item comes from South America: In view of the vast national importance of the new law limiting the production of nitrate of soda and making the Government the sole exporter of that most valuable article, the following data will be found interesting, as showing the steady increase of the demand:

In 1870, 2,500,000 quintals of nitrate were shipped from Peruvian ports to all markets abroad.

In 1871, this figure was increased to 3,000,000 quintals, and in 1872 reached the very respectable sum of 4,420,000 quintals.

PHILADELPHIA manufacturers, employing in the aggregate 10,000 persons, are, the *Inquirer* says, preparing to abandon Philadelphia, and carry on their business in Delaware, in order to be under lighter taxation. The proprietors of the Pascal Iron Works have already done so.

MINING matters at Little Cottonwood Cañon, Utah, are moving ahead in good shape, and there is every prospect for a big yield of ore next season, the principal work doing at present being preparatory.

THE Seattle Coal Company is now shipping 150 tons of coal daily.

worth of silk goods in a year. The report assigns as one of the drawbacks to a more speedy development, the fact that the California raw silk must all be sent to Europe to be reeled, the improved machinery necessary for that purpose not having, strangely enough, found its way as yet to this country. The American silks are universally admired, both in this country and in Europe, and when our facilities are matured will be able to compete with the world.

RAILWAYS IN SOUTH AMERICA.—The railways from Arequipa to the large interior cities of Cuzco and Puno are being pushed forward with much energy, the natural obstructions to be overcome rendering the labor one of extreme difficulty. Once on the level plateau running from Puno to within sixty miles of Arequipa, and that point is almost reached, the advance will be remarkably rapid. The line from Obimbote to Huzraz, considered by many well acquainted with the resources of the country as the most important railroad in Peru, has some thirty-six miles now ready for ironing.

NEW MAIL STEAMER.—The Pacific Mail Company's new iron steamer "Colima," 3,250 tons burden, was successfully launched from Rooche's ship-yard, at Chester, (Pa.) on the 6th inst. There are four others now on the stocks for the same company, of which two have a tonnage of 5,000 tons each.

COAL and quicksilver are claimed to exist in Mendocino county in the neighborhood of Ukiah.

USEFUL INFORMATION.

Relative Weights of the Sexes.

Somebody who has been "studying our weights" reports that, upon the average, boys, at birth, weigh a little more and girls a little less than six pounds and a half. For the first twelve years the two sexes continue nearly equal in weight, but beyond that time males acquire a decided preponderance. Thus, young men of twenty average one hundred and forty-three pounds each, while young women of twenty average one hundred and twenty pounds. Men reach their average bulk at about thirty-five, when their average is about one hundred and fifty-two pounds; but women slowly increase in weight until fifty, when their average is about one hundred and twenty-nine pounds. Taking men and women together, their weight, at full growth, averages about twenty times as heavy as they were on the first day of their existence. Men range from one hundred and eight to two hundred and twenty pounds (the Tichborns claimant weighs about three hundred and sixty pounds) and women from eighty-eight to two hundred and seven pounds. The actual weight of human nature, taking the average of all ages and conditions—nobles, clergy, tinkers, tailors, maidens, boys, girls and babies, all included—is very nearly one hundred pounds. These figures are given in avoidupois weight; but the advocates of the superiority of women might make a nice point by introducing this rule that women be weighed by Troy weight—like other jewels—and men by avoidupois. The figures would then stand—young men of twenty, one hundred and forty-three pounds each; young women of twenty, one hundred and sixty pounds, and so on.

DANGER FROM MATCHES DIMINISHED.—The danger from the use of matches arises from the fact that the head, or a portion containing the head of the match breaks off in the act of taking fire, falls upon the dress, and sets it in a blaze. But it is because the match when drawn across a rough surface in order to ignite it is always drawn toward the body, that the broken, blazing head takes that direction and so falls upon the dress. Probably ninety-nine persons in a hundred, when lighting a match, pull it towards the body, and not from it. The reason undoubtedly is, that the motion towards the body is from our anatomical structure, a pulling motion, which is stronger, and therefore easier than a motion from the body, which is a pushing motion. But whatever the cause, the fact is that most people in lighting matches, pull them towards the body; whereas, if they pulled them from the body, the head of the match, if it broke off, would almost always take the same direction from the body and the dress. We owe this to the observation of a friend, who once set his night gown on fire with a match drawn towards the body, and who was thus led to study the philosophy of the subject. He teaches his children religiously, to draw matches in a direction from the body; and if this rule were universally adopted, many useful lives would be saved every year. The suggestion is so obvious; so simple, and so truthful, that it ought to be published everywhere, where people who read can see it.

ZOPISSA.—An English officer has discovered the means of circumventing time in a transparent varnish which he calls Zopissa. It is used on exposed surfaces, filling the pores, making a surface so close that no water can penetrate it. It is also remarkably insensible to heat, asbestos being less destructible. As a varnish it equals shellac, copal, gum or pumice stone. In addition it is an excellent cement, uniting porcelain glass, building stone, and iron, while it unites wood, and is delicate enough to seal an envelope. The *Art Journal* thinks this is the substance with which the ancient Egyptians used to embalm their dead and preserve their works of art. It is a fact that, while the frescoes of Rome are becoming dim, the Egyptian mural paintings are fresh and pure. The paintings of Egypt have been exposed to a gas jet, but without any evil effects. If Zopissa even approaches this quality of endurance, which we have hitherto conceded to have been one of the "lost arts," its value will be unmistakable.

PETROLEUM FOR BOOTS.—Dr. Van der Weyde tells us petroleum is decidedly very injurious to leather; it shrinks the leather, so that boots dressed with it become finally so small that you can no more wear them. Leather pump-valves cannot be used for petroleum pumps, as they become so shrivelled up as soon not to fit any more, and cause the pumps to leak. If the manufacturers soaked only the pegs in petroleum, before putting them in, he thinks it might be beneficial.

TEA IN INDIA.—The experiment of growing tea in India is proving quite successful. In 1862 the crop was estimated at 1,000,000 pounds; in 1871, at something over 20,000,000. It is claimed that India can now compete with China in producing teas of the best quality.

A SANDPAPERING MACHINE.—The *Scientific American* thus directs to make a sandpapering machine. Use canvas belts strongly sewed together at the ends. The threads may be so tied together as to leave the face on emery side of belt perfectly smooth and level. Size the belt with a coating of thin glue and then let it dry. Hand the belt over two pulleys so that it can be easily turned. Use the last glue, of about the consistency for glueing wood; put it on hot with a brush, sifting the sand or emery on at once. Go round the belt as quickly as possible, then lay it on a smooth plank, and roll the sand or emery into the glue as hard as possible, (an iron pulley, loose on a mandrel, is best;) then hang up the belt to dry.

ABSENCE OF FEAR IN WILD ANIMALS.—In a letter from the Galapagos Islands the writer remarks the wonderful tameness of all the wild creatures that have hitherto been unmolested. The seals, he says, seemed to be fond of crawling under bushes, just above high-water mark, and sleeping two or three in a place. Under one bush lay a mother and her cubs, and so fearless was the old one, that when one of the officers held a piece of cracker to her nose she smelled at it as fearlessly as if she had been a pet dog. The tameness of many of the birds was also surprising, for the fingers might be put within half an inch of little yellow-birds, and within six inches of mocking-birds.—*Scribner's*.

THE SEXES.—There are more males than females born by 4 per cent. At the age of 20 there are more females than males. At the age of 40 the preponderance is again on the other side, and there are more males than females. At 70 the sexes are again even. Between 70 and 100 years there are more women than men, or an excess of 5 per cent. The mortality of woman is greatest between the ages of 20 and 40. After 40 years of age the probabilities of longevity, as is shown, are far greater for females than for males.—*Phrenological Journal*.

EGGS IN CASE OF TROUBLE.—Eggs are useful for many purposes besides food and for hatching. If you get a fish hove in your throat, and sticking fast there, swallow an egg raw and it will be almost sure to carry down a bone easily and certainly. There is another fact touching eggs which will be well to remember. When, as sometimes by accident, corrosive sublimate is swallowed, the white of one or two eggs will neutralize the poison, and change the effect to that of a dose of calomel.

STREET MAKING IN LONDON.—During last year two hundred and twenty-six new streets have been opened in London, with an aggregate length of thirty-eight and a half miles. During the past ten years one hundred and fifty thousand houses have been built in London, and new streets opened involving a length of six hundred and thirty-five miles. As large a number of houses are now built in London, annually, as are comprised in the entire city of San Francisco.

THE OIL FIELDS COMPARATIVELY EXHAUSTLESS.—It appears that the first oil field around Titusville, is again coming into prominence. Territory that was long since abandoned and thought to be worthless, promises to become as prolific as any in the whole oil region. Several wells recently put down in this territory flowed from 100 to 500 bbls. per day, and promise to maintain a yield equal to if not larger than those in the Butler district.

"ADAM'S APPLE," so called, is an enlarged section of the trachea or windpipe. It is larger in men than in women, and it is possible that the gruffness of the voice may bear some relation to that development. The name is said to have been given because Eve ate the apple and Adam swallowed the core, which stuck in his throat. But as food does not go down that pipe at all, we may presume that it is not the cause of it.

TO CLEAN GOLD CHAINS.—Put the chain in a small glass bottle with warm water, a little tooth powder and some soap. Cork the bottle and shake it for a minute violently. The friction against the glass polishes the gold, and the soap and chalk extricate every particle of grease and dirt from the interstices of a chain of the most intricate pattern; rinse it in clear cold water, wipe with a towel, and the polish will surprise you.

SMOKELESS POWDER.—Smokeless gunpowder is now manufactured in England named after the inventor, Schultze's Wood-Powder. It can be made cheaply; there is less danger in its manufacture, and gives more penetration than our black gunpowder. Such, at least, is the statement. We have been unable to learn whether it has been introduced into the United States.

A GOOD TRADE is always a comfortable companion to travel with, a something that a man can fall back upon in the time of need, and yet it does not preclude him from entering upon some profession, if his inclinations or genius develop the proper capacity. In fact, our most successful business men in almost every capacity are from the workshops and farms.

FLY POISON PAPER is usually made by impregnating common paper with a solution of equal parts of sugar and arseniate of soda.

GOOD HEALTH.

A Chapter on Eyes.

The eyes feel a great deal worse directly after the evening lamps are lighted, and after rising in the morning. At these times they need to become used to the change of light by degrees, and it is very injurious to use them in reading, sewing or writing, or in anything which requires close attention, until they have become accustomed to the various lights of the morning and the evening. Then warm water—quite warm water—is very much better for them than cold water. Never use anything else if you can help yourself, and when your eyes feel strained and overworked, take a cup of very hot water, and apply it with a handkerchief or a sponge, and see for yourself how soothing and beneficial are its effects. It is very essential also to use the weakest or highest numbered glasses when distinct vision, at a little distance, first begins to fail.

Dr. Williams, in his valuable little book entitled "Diseases of the Eye," says that when the symptoms of loss of adaptive power begin to be felt, the eyes should be aided by convex glasses of sufficient power to compensate for the deficiency; otherwise they are fatigued by futile efforts, and yet more serious disability may result. It is useless to postpone glasses in the hope that the necessity for resorting to them may be overcome. But many persons make a great mistake in procuring glasses of too strong a magnifying tendency, and thus accustom their eyes to it, and when they fall still more, as old age advances, are forced to adopt those of still greater powers. By doing this they weaken their vision too much, while they should do all in their power to strengthen it. As soon as a blur comes before the eyes, or they begin to ache or feel badly, put the sewing, book or pen directly down, and rest the eyes for at least fifteen minutes or half an hour. This is an imperative duty if you desire to keep your eyesight, and it is almost, if not quite, as important to you as your tongue, and much more so than your ears.

The sight in thousands of eyes has been sacrificed by over work, for the power of sight is easily injured when the physical system is prostrated by illness, and many mothers have done their eyes serious injury by endeavoring to read, write or sew when recovering from confinement. They know that many articles need attending to in the family clothing, and with weak heads and eyes, they undertake to do a little mending, which may prove disastrous to them. We delight in well-mended apparel, but do let me beg of you, mothers, not to try your eyes with darning stockings, shirts, etc., while you are still prostrated on a bed or couch, or kept a prisoner in a rocking chair.

Reading while lying down will always weary and injure the eyes, and is frequently a very serious cause of weak eyes.

Near-sightedness is common among young children, and many parents are unwilling that they should wear glasses on account of their youth; yet it is a great loss to them to go on, year after year, without ever obtaining a distinct, clear view of anything which is not close before their eyes. They lose the beauty of a distant landscape, and are debared from much enjoyment, and it is far better to allow them to use glasses at ten years old, than to wait until old age comes on, before they can avail themselves of the privilege of the far-sighted.

Aching eyes are far more common than they were twenty years ago, and for the benefit of the many who suffer from them, I give a recipe which has been of the greatest service to me, and which cannot injure any one, if simply applied to the outer lids of the eyes, and allowed to penetrate:

Two ounces of camphor water, four grains of morphia, and as much powdered borax as will dissolve in the water. Apply to the eyes half a dozen times a day, by pouring a little of it into the palm of the hand, and dipping the eye into it, or by wetting a fine linen cloth and laying it over the eyes. Label the bottle "Poison," on account of the morphia.—*Country Gentleman*.

ABSORPTION OF TOBACCO.—That tobacco does lodge in the tissues is evident from the following fact. The hydropathists have among their processes one which they call the wet sheet pack. The patient is enveloped in a wet sheet, and then—over this—in blankets. By this process they claim that through the operation of the principles of endosmosis and exosmosis, the water of the sheet is made to enter the body, while at the same time impurities are withdrawn therefrom. Now let the habitual user of tobacco be subjected for an hour to this process. When at the expiration of that time, his envelopments are taken off, the odor of tobacco coming from his body, and from the sheet in which he has lain, will be as perceptible to every one present as though a cigar had just been smoked in the room.

REMEDY FOR COLD IN THE HEAD.—Inhale hartshorn through the nostrils six or eight times a minute until relief is obtained. Then after an hour or so repeat again. This remedy is used in France with good results.

A MAN WITHOUT MUSCLES.—A faro-dealer in this city, about four years ago, was compelled to relinquish his profession by a paralysis of his right fore-finger. The nerve cell (in the spinal column) which supplied the joint had died from overwork, and the muscles of the finger gradually passed away through disuse—atrophied, the doctor called it. The dead cell in the spinal marrow in some way, by contact or sympathy, destroyed its neighbor, which controlled the same finger on the left hand. The atrophy extended over both hands, up the arms to the chest, shoulders and neck. At the present time there is not a muscle in those portions of the man's body. The arms hang useless and absolutely fleshless—mere skin and bone. The intercostal muscles are gone, and the man can make no respiratory movements requiring their actions; the esophagus, trachea, and spinal column clad in skin, and that is all, the processes of the latter standing out as plainly as in a skeleton. The head unsupported, hangs down on the chest, as if it were merely tied on. By a movement of the loins the man can throw his head over so that it will fall resting on his shoulders and back, but otherwise than thus, mechanically, he cannot control its motion. What parts the disease will next attack is a question with the physicians at Bellevue, where the case was shown yesterday, but the result is hardly doubtful. Breathing is done now wholly by the diaphragm, and must cease if that be attacked.—*N. Y. Ez.*

THE "BLEEDING FAMILY."—A singular story is told by a Milbridge, Maine, physician, of Rufus Mitchell, aged 30, who recently bled to death from a slight cut: "He was one of those unfortunate men who bleed from the smallest scratch of the skin, and many times he has lain and bled till it seemed that the blood had all run out, and then would gradually recover. This time the cut was quite large and he lived but a few hours. There is something remarkable about this family, who are here termed as belonging to the bleeding family. None but the males bleed, and they are the sons of the females of the same family. For instance this man has left children; none of them will bleed, but if the girls should have boys in their families, they will be of the bleeding kind, but the boys are themselves free and their families will be the same. I cannot explain this. I have practiced in the family more than twenty years. During this time a number of them have died from this cause, and others have lived often dangerously. They seem to be as careless about edged tools as though they were like other people.

THE CROUP.—When there is indications of an immediate attack of croup, or rather when the symptoms indicate that it is already at work, grease the breast thoroughly with goose-grease, and lay on it a double thickness of flannel. If the strangling comes on suddenly, mix Scotch snuff and lard together, put on a piece of brown paper, and apply instantly to the breast, rubbing the throat meanwhile with hot grease, or lard, or oil. Or you can do this: Dip a flannel in water, as hot as it can be borne, lay it on the breast, take salt hutter, spread on a piece of brown paper, and apply to the breast and throat. Salty butter rubbed on the throat and chest, just before going to bed, is a most excellent remedy for sore throat; two or three applications being enough to effect a cure.

COFFEE.—Dr. Hahnemann, the author of homeopathy, in an essay on the effects of coffee, states that it prematurely stimulates and develops sexual passion in both sexes, and brings the human body to its full or maximum maturity ten or fifteen years sooner than we should reach this period without it, which if true is really a frightful fact; for if we hasten or force human life ten years in the first stages, we of course shorten it that much in the later stages, and this amounts to a total loss of so much human life, from the action of coffee alone upon the organism. And now add to this, the debilitating and enervating effects of tea, tobacco, spirituous and malt liquors, what must be the cum total of the losses? F. M. A.

SMALLPOX NO RESPECTOR OF PERSONS.—During the year 1872 there died of smallpox in the city of Philadelphia 2,500 persons. It was confined to two districts of the city, situated at opposite ends—the one a foul and unwholesome locality, where the sanitary regulations are never observed; the other inhabited by people in good circumstances, and the streets and dwellings of average Philadelphia cleanliness. Neither the filth of one nor the cleanliness of the other had any influence in preventing or increasing the spread of the scourge. It remains now to be discussed by medical authorities, and it is to be hoped in the interest of humanity some solution will be reached.

FRECKLES.—For the benefit of young persons afflicted with freckles, we would inform them that powdered nitre, moistened with water, applied to the face night and morning, will soon remove all traces of them.—*Druggists' Circular*.

REMEDY FOR CHILBLAINS.—A writer in a Vienna medical magazine says that a concentrated solution of chloride of iron is an unfailing remedy for chilblains.

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San Francisco:
Saturday Morning, March 15, 1873.

Legal Tender Rates.—S. F., Thurs., Mar. 13.—buying 87½; selling 88½.

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PROF. WM. P. BLAKE AT VIENNA.—We are pleased to learn that the United States commission of the Vienna Exposition, have decided to send Prof. Wm. P. Blake to Europe for the express purpose of studying up the Vienna Exposition, and reporting upon it for the special information of the citizens of this country. It is probably known to most of our readers that the Professor, who was sent to the Paris Exposition as a representative of this State, was retained by the Government at Washington, after his return, to edit the reports of the various State and National Commissioners sent out from the United States to that Exposition. The able and satisfactory manner in which he performed that responsible and delicate task is sufficient guarantee that rich lessons of experience and profit will be harvested in the new field to which he is now accredited.

Mr. Blake's well-known knowledge of, and interest in, the mines of the Pacific Coast will insure for that department of his work much valuable information which will be of special interest to Californians. The readers of the Press will probably hear from the Professor, during his stay at Vienna.

WASHOE BULLION SHIPMENT.—During the month of February there was shipped through the office of Welle, Fargo & Co., in Virginia City, \$1,629,993.16. This was at the rate of \$53,214.04 per day, or \$19,559,917.92 per year, reckoning from February's production, which is the shortest month in the year.

DR. CARR still continues his industrial lectures to the laboring classes of Oakland, and we understand that the attendance is increasing, which shows the degree of interest people will take in such subjects when they are explained to them, divested of technical details and abstruse language.

AUSTRALIAN MAILS.—Webb's line of steamers, running from this city to the Australian colonies having been withdrawn, all correspondence in that direction must go by the British mail via England.

The Past and Present Values of Our Mines.

On looking over the prices of mining shares as they are quoted to-day, a person who was not fully initiated in the mysteries of stock gambling might suppose that our great gold and silver-bearing ledges were exhausted and that the quartz mines which have been the great source of the wealth and prosperity of California, Nevada and Idaho, were things of the past, and no longer presented any chances for a safe investment of capital. We acknowledge, that it is impossible to conceal, and very difficult to explain away the fact, that, within the last ten months, the mines on the Comstock alone have depreciated in value to the extent of eighty millions of dollars, and those of every other mining district on the Coast in like proportion. It is equally difficult to explain how this great depreciation has taken place in the face of a steadily increasing yield of bullion, and no increase of expenses worth mentioning. The quantity and quality of the ore extracted throughout California and Nevada have been fully up to the standard of any preceding years, and yet in place of dividends, with some half dozen notable exceptions, we see nearly every mine in these two States and in Idaho, levying frequent assessments. In Virginia alone about four thousand tons of ore are sent daily to the various mills of that locality, every ton of which leaves a fair margin for profit; notwithstanding all this, there are but two mines in that section, that have ever paid a dividend for years. These are the Crown Point and Belcher, and even in these two instances, the dividends are very irregular, being frequently passed for three or four months at a time, when there is about half a million dollars lying idle in the treasuries of each of them. Out of some thirty-five or forty California mines, which are daily gambled in, in the San Francisco Stock Board, no one ever expects to hear of a dividend from any one of them, except the Amedor and Eureka. In Ely district there are about fifty incorporated companies, yet the Raymond & Ely is the only mine paying a dollar to the shareholders, in Belmont there are none. In White Pine, none; and from Eureka, which is probably the most shamefully swindled district of all, there has been no dividend from any of its mines for the last fifteen months. In Idaho, the management of all the Owyhee mines has been notoriously corrupt, that no one expects ever to receive a dollar from that section of country, unless as in the case of the Mahogany last year, a dividend were to be declared, in order that a heavy assessment might be levied the following week.

All these things are working sadly against the mining interest of the country both at home and abroad. In England with their staid, old country notions of honesty and fair dealing, they insist that our mines are failures, from the fact that they are non-dividend paying, and require to be kept up at such an enormous outlay of money. They argue that as the Trustees of every company are elected by the majority of the shareholders, that these men are probably the largest owners themselves, and certainly must have the interest and welfare of the mines at heart. They little know that in this country men are often elected Trustees who do not own a single share of stock, or who have merely hired it for election dry, in order that they might have a fair chance to plunder a mine for twelve months; let our English cousins console themselves with the reflection, that they receive dividends from many of their mines in this country, which, were they controlled by San Francisco stock sharps, would be a heavy drain on the pockets of the shareholders.

However, this gigantic evil is working its own cure. No outsider now wants to touch mining stock at any price, but let it go for assessment or any thing it will fetch, nor is it likely that there will be any change in this state of things, until the present ring of mining trustees withdraw and give place to men who have the confidence of the community.

VIRGINIA CITY has at last got the epizootic and the livery stables, etc., are all closed while it is in progress. Ox teams are in great demand for hauling quartz, since local transportation by ordinary means is out of the question. The scarcity of wood having been partially overcome they now have another annoyance in the shape of scarcity of horses.

THE MARIPOSA Mill at Virginia has been compelled to shut down for want of fuel.

Pan Amalgamation Again.

[Written for the MINING AND SCIENTIFIC PRESS.]

The following interesting communication explains itself:

In your issue of March 1st I notice a summary of the lecture lately delivered by Mr. Riote on the subject of Amalgamation. The lecturer, as quoted by you, decried the use of chemicals in pans, under any and all circumstances, declaring that their action is always detrimental and never beneficial. Further on, however, he admits the advantage of using certain chemicals in working slimes, but makes the remarkable assertion that their action in this case is purely a mechanical one. Now these sweeping denunciations of Mr. Riote being directly opposed to demonstrated facts, and merely the echo of popular prejudices, they cannot be permitted to go unchallenged.

The opposition to the use of all

Chemicals in Pan Amalgamation

Is mainly due to the indiscriminate use made in early days by ignorant persons of chemical re-agents, which had nothing to recommend them but a high sounding name or a brilliant color; but I propose to show that, by employing the proper substances, in adequate quantities, the most favorable results have been obtained, dispensing in many instances with the necessity of roasting the ore, rendering possible the profitable reduction of minerals which otherwise could not have been touched, and giving rise in Virginia City and environs to a great and entirely new branch of industry. All this has been effected by the use, in reasonable quantities, of sulphate of copper and salt, which, by their mutual decomposition, form chloride of copper. The beneficial

Action of these Substances

On silver ores has been known since the middle of the 16th century, existing in Mexico the Patio process, which to this day has never been abandoned or materially altered. It is needless to go into the chemistry of the process, which has been often and variously discussed. It is sufficient to show by a similarity of result that the reactions are essentially the same as when sulphate of copper and salt are used in the pan, with several advantages in the latter method, namely: a high temperature, violent motion, and the presence of a large amount of iron. These all compensate for the apparently very short time allotted to the chemical reactions in the pan, and the iron, moreover, produces a galvanic action which diminishes the chemical loss of quicksilver.

It has been proven in Mexico that merely by increasing the number of "repases" the time necessary to the amalgamation of the ore could be reduced from twenty-five days down to three days. The "repaso" consists in causing horses or mules to walk backwards and forwards through the slushy mass of pulp. If we consider how imperfect is the trituration of ore and quicksilver, and how feeble the motion effected by this means, there is no cause for surprise that the amalgamation should be reduced to a period of six or seven hours by the great heat, violent motion and galvanic action in pan amalgamation.

Bluestone and Salt

Were used by Washoe millmen in early days, but never in an intelligent manner—some using either salt or bluestone separately; others the two together, but always in infinitesimal quantities. It is now four years since those chemicals were first used in pane on a large scale. Up to that time most of the battery slimes, especially from the low-grade ores, were allowed to run to waste in the Washoe mills, as only 35 per cent. of their value could be extracted by the ordinary system of amalgamation. Experiments made at the time referred to proved that by adding to the elimes after their introduction into the pan, a quantity of sulphate of copper and salt, which, to the then prevalent notions, appeared enormous, over 75 per cent. could be extracted. From that time on no more slimes were allowed to run to waste. Mills were built for the especial purpose of reducing them by the new process, and have paid their owners enormous profits. It was soon discovered that the "process" was equally well adapted to the

Working of Tailings.

It became possible to work tailings assaying only seven or eight dollars per ton, and hundreds of tons are now daily reduced in Dayton, on the Carson river and elsewhere, which would yield but the merest fraction of their precious contents under the old system of amalgamation with quicksilver alone. The enormous demand for sulphate of copper caused the erection of a

Bluestone Factory

By Birdsall & Co., in Dayton. They manufacture on an average 4,000 pounds of bluestone daily, which is barely sufficient to supply that one district. No candid mind can suppose that this industry could be kept up were its

products not indispensable to its patrons. But the

Advantages of these Chemicals

Are not restricted to Virginia ores. They have been most successfully employed in the Mill of the Meadow Valley Company from the very start, and ore which with quicksilver alone would barely yield forty-five (45) per cent. of its value, here by their additions been made to yield seventy-five per cent. and over. This was well demonstrated at one time, when the supply of bluestone became exhausted. The yield fell off one-half, and only that portion of the silver was extracted which, as showed by numerous chlorination tests, was naturally present as chloride of silver. Neither salt, nor sulphuric acid and selt, nor any other chemicals stand were found to have any effect in increasing the yield; and not until the receipt of a fresh supply of bluestone did the ore give its former satisfactory yield. Various experiments have proven that the sulphate of copper and salt are indispensable in working these ores, increasing the yield by 35 to 40 per cent., except on certain lots of ore, where the greater part of the silver is naturally present as a chloride. The Raymond & Ely Company also has recourse to the use of these chemicals when their ore, usually very "free," becomes more refractory. The same process has been introduced into several other mining districts; in one instance by Mr. Kustel, from whose book, printed ten years since, Mr. Riote quotes a garbled extract. In this instance Mr. Kustel found the yield increased 40 per cent. The quantity of bluestone necessary to produce these results is in reality very small, rarely exceeding ten pounds per ton of ore, and in the case of low-grade tailings falling as low as five pounds per ton. The quantity of salt used is from two to three times the weight of the bluestone.

Exceptional Cases.

Not in all cases can these chemicals be used with equal advantage. Certain combinations, such as ruby silver, or ores containing appreciable quantities of galena or zincblende, etc., must be roasted. The presence of carbonate of lime, or any alkali tends to decompose the chloride of copper and destroy its effect, or when the silver appears naturally as a chloride the addition of chemicals is to a great extent superfluous, but it may safely be stated as a general rule that wherever ores are amalgamated raw, the addition of bluestone and salt will always prove beneficial, and never detrimental.

In regard to the pernicious

Action of Chloride of Copper

On quicksilver, it is safe to say that it is more apparent than real, on a large scale. The tilling mill around Virginia City suffer little more loss than the ordinary quartz mill, which use no chemicals; and in other districts where chemicals are used, the ores carry large amounts of lead and other base metals, which of themselves occasion a loss of quicksilver, which it would be unjust to attribute to the action of the copper salt. The

Loss in Working Slimes

Is abnormal and mechanical, the clay acting upon the particles of quicksilver in the same manner as grease, causing them to float and be carried off with the residues. This is merely a matter of dollars and cents, and while a supply of quicksilver can be readily obtained, millmen are not likely to consider the matter from a politico-economical standpoint. This argument also holds good in the matter of depreciated fineness of bullion, since bullion is made for sale and not for show; the discount suffered on base bullion stands in no proportion to the extra amount of silver extracted from the ores by the use of chemicals. In view of these facts, it is to be regretted that Mr. Riote should have publicly and in the name of science constituted himself the champion of exploded theories.

That the sphere of usefulness of sulphate of copper and salt can be greatly extended, admits of no doubt. The yield of Comstock ores would be greatly increased thereby, and hundreds of thousands of dollars which are now lost or only partially recovered at the expense of a second working, would go to swell the profits of stockholders. ALEXIS JANIN.
San Francisco, March 12.

FORMATION OF MOUNTAINS AND VALLEYS.—We

notice that the Loudon Mining Journal calls the attention of its readers to the fact that Mr. J. S. Phillips, in his California hook—"The Explorer's, Miner's and Metallurgist's Companion," set forth therein what is now known as Mallett's theory of the formation of mountains and valleys, some two years in advance of its promulgation by Mr. Mallett. Our readers will recollect that we made an extended reference some weeks since in these columns to the priority of claim on the part of Mr. Phillips.

The Mining Journal also contains the following paragraph as a statement of recent ideas, with regard to earthquakes which he entertains, and which he has embodied in the form of a foot note for his second edition. "As the earth continued its cooling, other internal, hollow globes, would in like manner be forming from plastic to solid states, which, when compressing laterally, as described in the crumpling of surface mountains, certain portions would then rub violently against the interior of the colder outer shell, and produce such motions as earthquakes, a greater degree of heat and force for the pent up gaseous elements to release themselves through surface volcanoes."

Gold and Iron Sands.

Recent developments, here and in New Zealand, are directing public attention once more to the auriferous sands of our northern Coast. The presence of gold in these sands in paying quantities is well understood; and it is also known that immense deposits of these sands exist high above the present sea level, known as ancient beaches formed prior to the latest upheaval. For twenty years or more these sands have been worked by a few men, sometimes with great profit, by the ordinary mode of sluicing and amalgamation with copper plates.

In this way fully three-fourths of the gold is lost, owing to the gold being in fine, flaky particles and the black sand very heavy. Recently one of the heaviest operators in these sands, F. G. Lockhart, who has a valuable claim on the ancient ocean beach near Coos Bay, has successfully tried the chlorination process. From several tons worked, it is stated he obtained an average of \$29 per ton at an expense of \$4 per ton, and saving over ninety-five per cent.

This result being eminently satisfactory it is likely to give a new impetus to

Beach Mining.

The absence of sulphurets from these sands, so simplifies the process that its advantages are at once apparent to experienced miners. To mine without blasting or crushing rock; without sinking or pumping out shafts; without the use of costly machinery, quicksilver or gunpowder; and without constructing long water ditches or flumes; in short to mine extensively with a small capital and at little risk, are inducements which are not likely to be overlooked by practical men.

A New Value in the Sands.

But the gold in these sands gives them but a quarter of their actual value. The magnetic black sand, or titaniferous iron-sand, as it is usually called, contains, when pure, 72 per cent. of iron, and by the proper mode of smelting, is convertible directly into excellent steel, almost as cheaply as pig-iron is produced. This is now being done in New Zealand where similar sands exist in abundance. The latest Auckland papers give full accounts of the successful smelting of these iron sands, resulting in the production of superior qualities of both iron and steel, at a cost not exceeding \$25 per ton. At the present prices of iron and steel this affords a pretty big margin for profit, and as a consequence some excitement prevails there and companies are forming to enter largely into the business.

The same thing may be done here undoubtedly; and it is high time our capitalists commenced the development of our vast iron resources. The present time is favorable for doing so, with a guarantee against loss in the undertaking. The gold in the iron-sand of Gold Bluff and other points on our Coast, will pay all expenses of establishing smelting works for iron and steel and leave a profit besides. Five, or at most ten thousand dollars, is ample capital for erecting chlorination works at the mine, and the profits of these works will in a few months build smelting works for the manufacture of iron and steel on a large scale. Fuel and water are abundant, and navigable waters connect the localities of the mine with this city.

Should it require some experimental trials to learn the process of

Smelting this Sand,

It need be no discouragement, since the gold obtained by chlorination will meet all expense. It is well-known that steel is simply carbonized iron. Pig-iron contains too much carbon, and, ordinarily, it contains sulphur, manganese, and other impurities, which have to be eliminated before it can be converted into steel by the orthodox process of manufacture.

Wrought iron is that metal in its purest form. If we have one that is free from impurities the melted product is necessarily free also from them, and therefore pure iron. Then, by combining with it the proper proportion of carbon, during the process of smelting, the result will be steel. The iron obtained by smelting this sand in New Zealand is malleable, like wrought iron, and consequently must be quite pure. A portion of the product turned out thus far in their operations is iron of this character, and the remainder is steel of superior quality. This of course is the portion that is efficiently carbonized by the fuel used in the operation of smelting. Experience will soon

teach them how to convert the whole into steel before it leaves the furnace.

The question as to what are

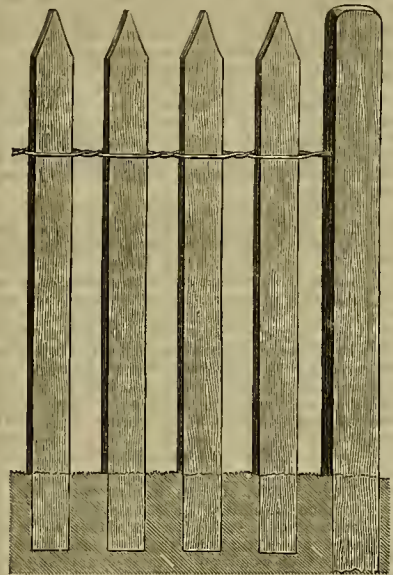
The Proper Fluxes to Use,

And the proportion of each to be used, in smelting these iron sands, must be solved in the same manner by experience. But it cannot be a difficult problem for experienced smelters to solve. Clay and lime used together in proper quantities, are the proper fluxes for silicious ores like these sands. There is sufficient silica in the form of common sand mixed with these iron-sands of our beaches, to reduce their average value probably to 50 per cent. of iron. In New Zealand the beach sand is mixed with clay and lime and made into bricks, which are sun-dried and then broken into lumps and smelted in a blast or cupola furnace. It would clog the blast if fed into the furnace in the form of sand. Other forms of furnace might be used probably and the labor of making the bricks avoided. Perhaps the new oxy-hydrogen heat, resulting from the combination of superheated steam and hydro-carbon oils, will prove better adapted to this branch of the smelting business than the fuel heretofore used. Shall we let the New Zealand people get far ahead of us in this new enterprise?

An Economical Fence.

The accompanying cut shows a patented method of constructing fences which is extremely simple. It is stated that three men can put up 600 yards of this fence in a day. In mountain districts, where small fences are required, and wood has to be hauled any distance, a wood and wire fence of this description will be serviceable, being strong and light.

In building this fence, the first thing to be



AN IMPROVED FENCE.

done is to set the posts firmly in the ground, placing them from twenty to thirty feet apart. Two wires are drawn through a hole in the first post set, and through similar holes in other posts to any convenient distance. The wires being fastened at the first post, are left slack along the line for the insertion of pickets, and wound around the last post of the section of fence under construction, to keep them from being drawn back during the insertion of the pickets. The slack being taken up, the battens of the palings are successively set in a shallow trench, dug between the posts on the fence line. The tops being inclined until they will enter between the wires from the under side, are then brought into a vertical position. As fast as the palings are inserted their butts are held by filling in and packing the earth in the trench. The wires may be tightened, if they should ever become slack, by simply putting a twist in them—using a pair of palings for this purpose, and turning them in opposite directions. This fence is impassable to large or small animals, and no openings can be made by pulling off pickets. The pickets take the strain off the posts, each one, in fact, being a post.

The wire usually used in building this fence is No. 10 galvanized, such as is used for telegraphic purposes; 100 ft. weighs five pounds, and costs in this city 60 cents, which is 20 cents for each rod of fence. Split or sawed palings can be used, and, when necessary, willows or small bushes, which will of course lessen the cost. Wiester & Co., No. 17 New Montgomery street, are agents for this Coast, and can give further information to those desiring it.

THE DIFFERENCE. — An English paper comments on the similarity between California and Australia in several particulars, especially the agricultural, wool and mining interests. Interest on money in Australia is three per cent. per annum, while here it is from 10 to 15 per cent. per annum. The *Call* thinks the difference is simply because California is full of enterprise, while Australia is lacking in this element of prosperity.

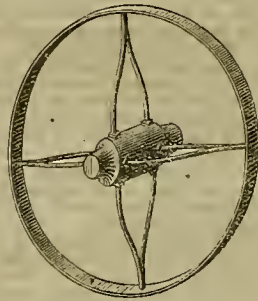
The Prall Steam Pump.

While at the Pacific Foundry this week we had an opportunity of examining a steam pump, which for simplicity of construction and operation excels anything we have before seen. It is simply two cylinders joined together above and below with pipes, and is constructed without pistons, piston rods or stuffing boxes, levers, cams, cranks or fly wheels. There are no moving parts other than the valves, and it is noiseless in operation, as the water flows quietly in and out of the cylinders, forced by the steam. The steam exerts a direct pressure in forcing water out of the pump and by creating a vacuum, through its condensation, utilizes the pressure of the atmosphere to lift the water into the pump.

As we will shortly give an illustration of this remarkable invention, we will not go into detail of construction and operation at present. It will sound strange to say that it is frictionless and requires no lubrication, nevertheless such is the fact. By placing this pump 30 feet above the supply, water can be elevated and flowed into a tank on a level with this pump, with a pressure of steam of from one to two pounds, and for forcing water every foot of elevation above this point only half a pound additional pressure is required. The one we saw in operation was run by a small portable boiler and the steam it threw was perfectly regular, showing no intermittent action. It requires no engineer to run it and is not liable to get out of repair. It is worth the while of parties who use steam pumps and have the opportunity, to examine this one and see it in operation.

A New Iron Wheel.

The accompanying cut shows a wheel of improved construction, which is particularly applicable to wheelbarrow and truck-wheels, and the wheels of toy-wagons. Its construction is quite simple, and consequently cheap, while the peculiar method of making it will render it strong and durable. The tire is made



WITHINGTON'S PATENT WHEEL.

of iron or other metallic substance. The spokes consist each of a metallic bar or rod, which is bent as shown, so that each half will serve as a bracing spoke. The bend of the rod is flattened, so as to fit against the inner face of the tire, and a rivet, screw or other fastening device, is employed to secure it in place against the tire.

The opposite end of these spokes or rods, which is next to the hub or axle, is provided with screw-threads, upon which a nut is screwed, and the end of the spoke enters a hole in the hub or axle, directly under the nut. By screwing this nut up or down on the spoke the spokes can be tightened or loosened as desired, the nut being against the hub. By this means a strong, substantial wheel is constructed, which can be made very cheaply. For agricultural implement wheels it is particularly applicable. The device has been patented through the agency connected with this office, by George Withington, of Ione City, Amador Co., Cal.

NORTHERN PACIFIC RAILROAD.—The following named gentlemen were elected Directors of the Northern Pacific Railroad, at the annual meeting of the company, held in New York on the 12th inst. W. G. Fargo, Geo. W. Casa, R. D. Rice, Charles B. Wright, W. B. Ogden, Frederick Billings, J. G. Smith, W. G. Moorhead, A. G. Barney, William Windom, James Stinson, B. P. Cheney and Albert A. Catlin. It is understood that within a few weeks the Yellowstone, Lake Penn d'Oreille and Puget Sound sections of this line will all be in process of construction.

THE RAYMOND AND ELY SUIT.—A dispatch from Pioche states that the case of the Raymond & Ely vs. the Kentucky has been continued until March 17th. Several prominent lawyers have arrived there from San Francisco and Virginia City to argue in the great mining suits now pending in the District Court.

Spectrum Analysis.

Professor Neri's second lecture on Spectroscopic Analysis, delivered on Thursday evening of last week, was still more largely attended than his previous one, a fact which shows that this community is not at all behind our sister cities at the East in its appreciation of science.

The first lecture having been more particularly devoted to the history of the discovery of the spectroscopic and its wide and wonderful appliances; the second aimed to show how and by what means that instrument has been able to accomplish the astonishing and important results which have been derived from it. This is done by the power which it possesses to

Analyze Light.

It is by the light given off by the various substances—and by light alone—that the spectroscopic is able to determine the character of the substances to which it is applied. We know that light possesses certain properties, and that the light of different substances varies in its nature. The spectroscopic does not tell us in what the nature of the difference between the light given off by various substances consists; it simply shows that every substance known, when heated to a point of illumination, presents certain phenomena in passing through the spectroscopic, which is peculiar to that substance, and which is possessed by no other substances. Hence there is never any danger of mistaking one thing for another, when submitted to the test of that instrument.

Various interesting and instructive experiments were shown to prove those positions, during which the magnesium light, the oxy-hydrogen light and the electric light were shown—each having its peculiarities. The latter approaches nearer to the light of the sun than any other illuminating medium known. The electric light possessed an intensity of about 600 candles, or one-quarter that of a sunbeam.

What is Light?

What is the substance of light, what its essence, its nature? Of this nothing really certain is known. The early idea of the nature of light—and that which was supported by Newton—was that it consisted of an infinite number of minute particles or molecules, which were projected upon the retina of the eye, thus conveying to our senses the idea of light and color. This was called the corpuscular theory, but is now abandoned.

The Modern Theory

Is that light is due to the vibrating molecules of luminous bodies. Their vibrations, when they emanate from a sun or star, are communicated to and set in undulatory motion a very thin elastic medium, which pervades all space, and by which motion each light is conveyed to our vision—not that the particles of the medium travel, but that the motion is transmitted, just as the waves of the sea move forward, while the water itself is at rest or perhaps moves in an opposite direction. Different kinds of light move with different degrees of motion with waves of different size or different velocity.

Reflection and Refraction of Light.

Unobstructed light travels in straight lines; but when it meets any substance which it cannot penetrate it is thrown off at a greater or less angle. Several pleasing and instructive experiments were introduced by the use of mirrors, etc., to show and explain this principle.

Some substances, however, although they do not reflect and turn entirely aside the rays of light, hinder them, more or less in their passage. Some things like the prism cause the rays of the sun to diverge more or less from a direct line, and also to separate into different colors. It also shows that certain rays convey no heat, or but little, while others convey a large amount of heat—the latter are colorless.

Various interesting experiments were shown with prisms of different substances. The light was made to pass through a small globe filled with water, which projected an arch of colored light upon the screen—a rainbow in fact.

Another and perhaps the most interesting exhibition of the evening was the showing by means of Colladon's Fountain, that light thrown horizontally into a vessel of water will be so entangled or mixed with it as to follow the course of that of water when drawn off in a curved stream into another vessel at a lower altitude. We have not the space to do anything like justice to this interesting and really scientific lecture.

FREIGHT.—The Central Pacific Railroad carried East during January 3,749,300 pounds of freight, among which was 19,345 pounds of base metal and 39,969 pounds of quicksilver.

The Mother Lode of California.

We have received the advance sheets of "Statistics of Mines and Mining in the States and Territories west of the Rocky Mountains," by Rossiter W. Raymond, United States Mining Commissioner, being his report for the year ending December, 1871. We make the following extract from the chapter on California, which was written by W. A. Skidmore:

The mother lode of California is a vein, or, more properly, a series of veins of quartz which has been traced on a longitudinal line, with occasional interruptions, for a length of about seventy-five miles, from Bear Valley, Mariposa County, to Amador City, Amador County. Throughout the entire distance it has a general northwest and southeast course, and an almost uniform dip to the northeast of eighty degrees.

Whether this singular formation is a "lode" or a mere accidental occurrence of a series of veins on a longitudinal line in the same belt of slates, is a question on which eminent mining engineers have differed. It has been discussed in the report of J. Ross Browne of 1868, and in my report of 1869. Mr. Skidmore considers it as a defined lode, believing that recent developments, at various points, have a tendency to confirm this theory.

The most southerly well-defined outcrop of this remarkable vein is at the Pine Tree and Josephine mines, on the Mariposa estate, at an elevation of about 2,500 feet above sea-level. From this point it takes a northwest direction, striking across the numerous spurs of the Sierras which form the divides between the Tuolumne, Stanislaus, and Mokelumne rivers and their tributaries, and terminates in the foothills of Amador County, the most northerly deep-developed claims being the original Amador and Keystone at Amador City, although many locations between these mines and the Cosumnes River are supposed to be on the same lode. Beyond the Cosumnes the lode is not traceable.

Between its southern and northern extremities it is frequently broken up and lost, (invariably so at the intersection of the principal rivers,) making its appearance again at a distance of several miles, frequently in the form of a solid wall of quartz on the summits of isolated hills on the line of its strike, these croppings being visible for many miles. The most prominent of these hills are Pinon Blanco, Quartz Mountain, Whisky Hill, and Carson Hill. At these points the lode has widened with the "blossom" of the mountain, and presents the appearance of a system of parallel veins separated on the surface, and to an indefinite depth, by "horse" matter, composed of nearly equal parts of slate, and broken quartz. Locations have been made in the majority of such instances on the croppings, parallel to each other, one on the hanging wall and another on the foot-wall of the lode, these walls being sometimes separated, as at Quartz Mountain, Tuolumne County, by a distance of from 200 to 250 feet; but recent deep developments at various points would seem to indicate a tendency of these walls to narrow, which at depths of from 1,000 to 1,200 feet, and in some cases less, would shut out the "horse" and develop a permanent fissure of from fourteen to eighteen feet in width.

The principal points at which mining has been prosecuted on the Mother lode, are Bear Valley, Princeton, and Mariposa, in Mariposa County; Quartz Mountain and vicinity, near Jamestown, Tuolumne County; Rawhide and Tintletown, in same county; Carson Hill, Angel's Camp, and Paloma, in Calaveras County; and Jackson, Sutter Creek, and Amador City, in Amador County; the deepest development having been made at Sutter Creek, where, at the Amador mine, a shaft has been sunk, and levels opened to the depth of 1,300 feet.

The entire length of locations made on the Mother lode is estimated at 180,000 feet, equal to half the distance between its northern and southern extremity. Many of these locations, however, run parallel to each other, and the ground continuously located would not exceed 100,000 feet, while the ground now in process of development (including only those claims on which work has been done in 1871) will not exceed 40,000 feet, exclusive of the Mariposa estate, on which operations are temporarily suspended owing to financial difficulties and litigation.

The longest break in the lode is between Angel's and Jackson, a distance of twenty-three miles, on which only one mine, the Paloma, near the south bank of the Mokelumne River, is generally acknowledged to be on the lode, though recent discoveries tend to prove the continuity of the lode between these points. At various points the lode "dives" for several miles, and at one point, between Whisky Hill and the Rawhide mine, it is covered by the lava flow which constitutes Table Mountain.

Throughout the entire course of the lode we find many instances of failure, manifested by abandoned works and idle mills, but these are to be attributed either to mismanagement or to the injudicious location of works at points where no pay-chimney exist. The early locations were made at any point where croppings appeared, and deep shafts were sunk, and mills erected on barren ground, without any effort to find the chimney of the vein. In this way thousands of dollars have been uselessly squandered by men utterly ignorant of mining, and these monuments of their folly have discouraged those who otherwise would have invested in quartz mining. Another cause for the stagnation of mining on this lode is the

improvident manner in which work has been carried on, resulting in the exhaustion of the surface deposits, which were worked by open cuts at various places down to the water-line, when operations ceased until shafts could be sunk and hoisting-works and pumping-machinery erected, the owners of the ground having committed the common error of failing to keep their ground developed in advance of their milling capacity. Perhaps a third reason may be found in the superior attractiveness of the mines of the neighboring State of Nevada, where fortunes are made (and lost) with greater rapidity in mining operations.

Patents in Japan.

Japan is very rapidly taking her place among the progressive nations. Steam power, telegraphs, railways and modern appliances are everywhere being introduced in that country and in May last the following patent law was created. Like the patent law of Mexico it is a little behind the age, as its privileges appear to be restricted to persons resident in Japan.

The Patent Laws of Japan.

Henceforward exclusive permission to trade in newly invented articles of all kinds whatever will be granted to the inventors; in consequence whereof, should any person residing in any part of the country be desirous of obtaining such exclusive permission, the application shall for the present be made to the Home office in accordance with the regulations which follow.

Patents shall be granted for a term of years to all persons who increase the convenience of life, who newly invent any chemical apparatus, machinery, utensils, or furniture, weapons, woven fabrics, etc., or who improve existing furniture or utensils. The term of years shall be fifteen years, ten years, or seven years, according to the value of the invention.

Any person desirous of obtaining a patent shall send in his application to the local authorities of the district in which he resides, accompanied by a description, drawings, etc., which shall be forwarded to the Home office, and the Home office shall issue the patent.

The objects of the invention or the improvement shall be carefully drawn in cross section and plan, and in the case of machinery the parts must be numbered or lettered in accordance with the description, so that everything may be clearly comprehensive at a single glance; and the seals of the inventor and of his surety must be attached to the drawings. Models may be furnished of articles of which drawings can not easily be made.

When the document containing the patent is issued by the Home office the local authorities shall deliver it after having obtained a receipt from the inventor and his surety.

A duty of five ryo (\$5.30) shall be paid annually in advance during the period for which the patent is granted into the hands of the local authorities. The duty may be increased or diminished according to the nature of the invention. The amount shall be forwarded to the Home Department as soon as it is collected. No duty shall be paid until six months have elapsed from the granting of the patent, that period being allowed for the inventor to try whether the sale be remunerative, and when he has ascertained that it is remunerative he will pay in one year's duty to the local authorities.

If from the trial made during the first six months the sale turns out to be unremunerative the application may be withdrawn at the option of the patentee, but in case such application be made after the expiration of the six months, the duty for one year already paid in advance will not be returned. The application sent into the Home office will receive consideration according to priority of arrival.

Where the invention of another has already been improved, the application must distinctly state the name of the original inventor and the nature of the improvement. Where the invention in respect of which an application is made resembles a prior invention by another individual, but actually differs in construction or use, the points of difference must be clearly laid down in the application.

No patent will be granted for articles of general convenience, though the inventor be known beyond the possibility of mistake, and be yet alive, if the invention has been in general use for several years previous to the application.

Separate patents will not be given to each individual who may have combined with others to produce an invention, but a single patent will be issued in the name of all the partners of the company.

The owner of a patent may freely dispose of it for such sum as seems fit, during the period for which it has been granted; and both parties shall make application to have the fact endorsed upon the patent. The patentee is at liberty to establish branch shops in his own name, or to teach others how to make the articles patented by him. Should the patentee die before the patent expires, he may leave the patent to a relation, but application must be made to have the transfer endorsed thereon.

The Home office shall publicly notify in each case that a patent has been granted to such and such a person, of such and such a place, giving also the names of the department, prov-

ince and the seat of the local authority, in consequence of his having invented such and such an article. Should the patentee incur such losses during the term of years as he is unable to make good, if the article after due inquiry is found to be of indispensable public necessity, an extension may be granted. Each separate article must bear the words "by Government sanction," together with the name of the inventor. Fines shall be imposed on persons who fraudulently make use of a patentee's name, or who, not being in the enjoyment of a patent, make use of the term "by Government sanction."

Little Cottonwood Mines and Railroad.

A correspondent of the *Alta* writes as follows from Little Cottonwood: In my first communication of the 4th instant, I promised further information in regard to the Little Cottonwood railroad, which is now under way between Sandy and Granite. The grading of this road was first started in 1871, by the Utah Southern, they then intending to complete this branch to Granite during that year; in fact, the track was laid about a third of the distance and the grading done nearly half way; but, as all the ties and rails were needed in extending the main road further south, the track was taken up and sent thither, and the work ceased for a time. As the ore so rapidly accumulated at the mines, and no other means of disposing of it but by teams, it was necessary that some other way be provided, by which regular shipments could be made, consequently, last fall Mr. Sharp, Mr. Jennings, Warren Hussey and others formed a company and immediately proceeded to work. The grading between Sandy and Granite is now nearly finished, and ties and rails are being laid as fast as they can be procured.

This company evidently intend to have the cars running to Granite before commencing the ascent of the cañon, which is a work that will require a vast amount of labor and no small amount of means as the cañon is very steep and rugged, besides several places will be passed where snow-slides are of frequent occurrence.

In the winter and spring the same means will have to be provided in order to pass these places in safety at all times of the year. These slides are truly fearful things. Tremendous bodies of snow that start for a mile away, and gradually increase, and by the time they reach the bottom of the gulch they become impossible to resist, and sweep everything before them; yet, it must be remembered these places are very few in number, and I might say, there are but five places between here and Granite that are dangerous, and even these can be avoided, except in heavy storms, when neither life nor property are safe. Many suggestions have been made with regard to the best policy of fixing such places so that there will be no danger to the constant running of the cars.

Some think that the best policy would be to make cuts in such places, and then cover over with heavy timbers, that in case slides did come they would go on their course and harm nothing. This certainly is the safest plan, as nothing that could be built upon the surface would stand good against their force.

A Wire Tramway.

From a responsible man here, who has correspondence to that effect, I learn that as soon as the spring opens a wire tramway will be built, commencing at Grizzly Flat, and run to Granite. Mr. Hallide, of San Francisco, it is said, is the individual who intends building it.

One or the other, or even both of these enterprises, should be pushed ahead, as they are necessary for the development of the mineral wealth of this district. Although much doubt is expressed here about the possibility of a railroad being built, owing to the great amount of labor it will require and the roughness of the cañon, yet this is not an impossibility.

The railroad is needed as an indispensable necessity, especially for the safety of travel and the more rapid means of disposing of the vast amount of ore at the mines. By this means much of our low grade ore could be shipped to an advantage, which is now thrown away on the waste dumps, beside it will induce capitalists to invest, and thus aid in developing the country.

There is a whisper here that if the present parties who are now building the railroad do not complete the road in a reasonable length of time another company will be organized for this purpose who will not spare means or time for its speedy accomplishment.

The Christena Tunnel.

Owned by Dr. Vollum and others, of Salt Lake, is situated on the side hill a little west of the Grizzly mine, on the Davenport Hill. This tunnel was first commenced something over a year ago, and during the time has been worked at intervals. The length of the tunnel is 100 feet, where a shaft is being sunk, which is now down 45 feet, the contract being let for 80 from the top, where a rich deposit it is thought will be found, judging from other indications in that vicinity. Mr. John Murphy who has the contract, informs me that the rock is getting softer and not much trouble to blast, which is a decided evidence in their favor.

The Sherman Tunnel.

Belonging to an Illinois Company, 300 feet in,

is running to tap the Sucoor and State lodes, situated at the top of the Davenport Hill.

It is thought that it will take until the first of June to complete this tunnel, there still remaining two hundred feet yet unfinished. The Sucoor and State lodes are also the property of the above company, and are considered valuable property, each mine having a vein from eighteen to twenty inches of medium ore, with a small amount on the dump.

The Emma Hill Tunnel.

This tunnel, owned by Fred Fuller and others of Salt Lake City, is now in three hundred and forty feet, and running to tap the White Cloud, Southern Cross and Home Ticket, all owned by the same company.

The three leads just mentioned are in a line north and south, or nearly so, and not far from the Sucoor and State leads. The tunnel, in its course, will tap them all. The Home Ticket being farthest away. Fifty feet will strike the White Cloud, one hundred feet the Southern Cross and one hundred and fifty feet the Home Ticket. The latter is thought a very rich lead; in fact, it has quite a large vein, with considerable ore on the dump, only waiting to complete this tunnel, when work will be commenced in real earnest on these mines.

The Victoria and Imperial

Tunnel is a few hundred feet east of the last named, belonging to Mr. Washburn and company of San Francisco. Three hundred and fifty feet of this tunnel is now finished, and still they are driving ahead with three shifts, through a large body of lime rock, with earnestness, showing they are determined to find something that will pay for their labor.

Other Matters.

Several new slides have occurred in the neighborhood during the last week, but as far as yet learned no loss of life or property resulted.

The roads, owing to the late heavy fall of snow, have been blocked, except to footmen, but as the weather subsides twenty or thirty teams and a large force of men will reopen them again.

S. A. W.

Product of the Nevada Mines.

The product of the Nevada mines is one of great interest, and the *Alta* takes from the official returns a sort of history of the progress of the past two years. The assessment roll of the mines of Storey county, Nevada, gives the following product and value of the leading mines for the past two years to Dec. 31, 1872:

	1871.	Value.	1872.	Value.	Last yr.
Belcher.....	18,747	\$1,198,920	83,194	\$4,970,889	\$65.00
Crown Point.....	59,949	1,970,884	110,762	4,598,849	31.79
Chol.-Potomac.....	68,635	2,233,389	44,350	762,012	16.07
Empire.....	8,701	123,506	11,248	177,377	16.10
Hale & Nor.....	64,123	947,701	38,064	517,326	17.64
Savage.....	49,745	1,045,487	68,083	311,807	14.03
Sierra Nev.....	18,294	147,117	18,380	122,677	7.39
Woodville.....	.....	.....	860	10,604	10.16
Kentuck.....	0,183	140,089	11,138	141,847	8.90
Challenge.....	.....	.....	380	1,126	4.88
Total.....	287,377	\$7,804,093	371,349	12,028,162	

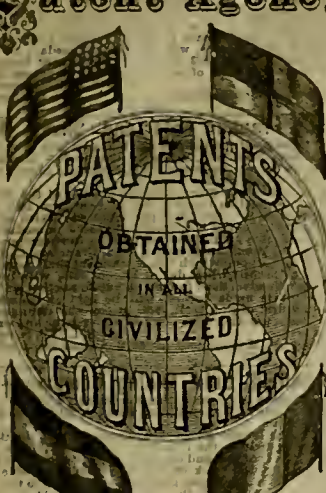
The average per ton of all the mines in 1871 was, it appears, \$27, and in 1872, \$32. This increase was mostly the result of the operation in the vast body of ore struck in the Belcher and Crown Point. If we take the quarterly figures of those two mines we have results as follows:

	1871.	Belcher.	Crown Point.	Pr. ton.
Quarter to	Tons.	Val.	Tons.	Val. ave
March 31.....	279	\$1,034	5,908	\$126,674 \$21.28
June 30.....	.....	.....	18,372	\$719,122 37.81
Sept. 30.....	2,829	212,038	17,240	\$266,650 30.68
Dec. 31.....	16,799	955,848	17,529	\$59,623 33.86
1872.				
March 31.....	20,698	1,071,350	19,121	\$1,030,149 53.42
June 30.....	21,932	1,203,037	35,183	\$1,759,748 50.10
Sept. 30.....	17,431	1,015,414	32,379	\$1,041,476 32.16
Dec. 31.....	23,133	1,604,868	24,079	\$787,478 32.79
Jan.....	8,601	437,495	16,000	\$210,450 41.43
Feb. 21 days.	7,822	460,493	10,479	\$324,474 62.00
Total, 1871.....	18,747	\$1,198,920	69,049	\$1,970,884 32.08
Total, 1872.....	83,194	\$4,970,889	110,762	\$4,598,849 41.60
1873, 62 days.	18,123	\$97,982	26,479	\$1,161,914 44.30

Grand total, 118,064 \$3,891,672 198,190 \$7,731,857

This table gives extraordinary results, showing the development of the body of ore common to the two mines. The Belcher until a few months since worked through the Crown Point, hoisting from the Yellow Jacket. The Crown Point first got its 1,200-foot level open just a year since, when the full mill power went on. The result was a production of \$1,759,746 in quarter ending with June. Then occurred several accidents, particularly the cave, which reduced the quantity of ore that could be worked, as well as the quality, since the cave matter could not be separated from it. In the December quarter the ore ran down to a low average, but the retimbering of the level was accomplished at an expense of \$150,000, and full operations have since been resumed. The ore in the 1,200-ft. level gradually rises in value as the cave matter is worked off, and the 1,300-ft. level is now adding richer ore to the mill supplies, and as the ore shows more gold, the value rises. The quarter to June 1, this year, will show 45,000 tons raised, of an average probably of \$60, giving \$1,000,000 more than the June quarter last year. The 1,400-ft. level is also nearly ready to tap. The Belcher is now operating upon the 1,300-ft. level through the Crown Point to the Jacket shaft, and the ore body there is immensely rich, and the production in that mine has given an average of \$55.05 in January and February. The results of the year's operations in the two mines must be immense.

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By Special Dispatch, Dated Washington, D. C. March 11th, 1873.

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EASTERN AGENT.—Albert H. Lewis, formerly of Atchison, Kansas, who has spent the past season in California, is now on the way to New York and other Eastern cities to represent the business of this office. Manufacturers and tradesmen who have the pleasure of an interview with him, can learn something of interest about California, and make favorable contracts for patronage of the several journals connected with this office.

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Admiral Nelson Tunnel and Mining Company.—Principal place of business, in the City of San Francisco, State of California. Location of works, Emma Hill, Little Cottonwood Mining District, Utah Territory.

NOTICE.—There are delinquent upon the following described stock, on account of assessment levied on the 27th day of January, 1873, the several amounts set opposite the names of the respective shareholders, as follows:

Names.	No. Certificate.	No. Shares.	Amount.
The President of the			
Company, in trust, Not issued.	19,604	1,950 40	
C. J. Collins.....	Not issued.	50	5 00
Henry Endey.....	Not issued.	50	5 00
Wm F. DeWolf.....	Not issued.	500	60 00
Wm H. Ashton.....	Not issued.	500	60 00
James P. Feull.....	Not issued.	4,444	444 40
H. J. Bidleman.....	Not issued.	4,444	444 40

(H. J. Bidleman has a "Special" Certificate, signed by the President and Secretary, attested by the Seal of the Company, stating that he will be entitled to the above number of shares when the stock of the Company shall be ordered by the Trustees to be issued.)

And in accordance with law, and an order of the Board of Directors, made on the 27th day of January, 1873, so many shares of each parcel of said stock as may be necessary, will be sold at public auction, at the room No. 1, in the building No. 539 California street, in the City and County of San Francisco, California, on Monday, the 31st day of March, 1873, at the hour of 12 o'clock m., of said day, to pay said delinquent assessment thereon, together with costs of advertising and expenses of the sale.

R. H. SINTON, Secretary.

Office, Room 1, No. 539 California street, San Francisco, Cal. m15-3t

Angels Quartz Mining Company—Principal place of business, 405 California street, San Francisco, California.

NOTICE is hereby given, that at a meeting of the Board of Directors, held on the 14th day of March, 1873, an assessment of one dollar and fifty cents per share was levied upon the capital stock of the corporation, payable immediately in United States gold and silver coin, to the Secretary, at the office of the company, room No. 1, 405 California street, San Francisco, Cal.

Any stock upon which this assessment shall remain unpaid on the 31st day of April, 1873, will be delinquent, and advertised for sale at public auction, and unless payment is made before, will be sold on Monday, the 21st day of April, 1873, to pay the delinquent assessment, together with costs of advertising and expenses of sale. By order of the Board of Directors, CONGOLO, Secretary.

Office—405 California St., Room No. 1, up stairs.

Dauphin Mining Company—Location of works, Wyandott District, Butte County, California.

NOTICE.—There are delinquent upon the following described stock, on account of assessment, No. 1, levied on the eighth (8th) day of January, 1873, the several amounts set opposite the names of the respective shareholders as follows:

Names.	No. Certificate.	No. Shares.	Amount.
Balcom, C. F. Trustee.....	1	100	\$40 00
Balcom, O. F. Trustee.....	2	100	40 00
Balcom, C. F. Trustee.....	7	100	40 00
Balcom, O. F. Trustee.....	8	100	40 00
Balcom, C. F. Trustee.....	9	100	40 00
Balcom, O. F. Trustee.....	10	100	40 00
Balcom, C. F. Trustee.....	11	100	40 00
Balcom, O. F. Trustee.....	12	100	40 00
Balcom, C. F. Trustee.....	13	100	40 00
Balcom, O. F. Trustee.....	14	100	40 00
Balcom, C. F. Trustee.....	15	60	20 00
Balcom, O. F. Trustee.....	16	25	10 00
Balcom, C. F. Trustee.....	17	25	10 00
Balcom, O. F. Trustee.....	18	100	40 00
Balcom, C. F. Trustee.....	19	100	40 00
Balcom, O. F. Trustee.....	20	100	40 00
Balcom, C. F. Trustee.....	21	100	40 00
Balcom, O. F. Trustee.....	22	100	40 00
Singer, R. O.....	69	300	200 00
Kreider, S. D. Trustee.....	86	400	160 00
Kreider, D. Trustee.....	87	1000	400 00
Kreider, S. D. Trustee.....	87	1000	400 00
Balcom, C. F. Trustee.....	88	1250	500 00
Balcom, O. F. Trustee.....	89	1250	500 00
Balcom, C. F. Trustee.....	90	1200	480 00

And in accordance with law, and an order of the Board of Directors, made on the eighth day of January, 1873, so many shares of each parcel of said stock as may be necessary, will be sold at public auction, at the sales room of Maurice Dore & Co., No. 327 Montgomery street, San Francisco, California, on the eighth day of March, 1873, at the hour of 12 o'clock m., of said day, to pay delinquent assessments thereon, together with costs of advertising and expenses of the sale.

CHAS. F. BALCOM, Secretary.

Office, 426 Montgomery street, San Francisco, Cal. te22

POSTPONEMENT.—The above sale is postponed until Monday, the seventh day of April, 1873, at the same hour and place. By order of the Board of Directors.

m15 C. F. BALCOM, Secretary.

Eagle Quicksilver Mining Company—Location of works, Santa Barbara County, California.

NOTICE is hereby given, that at a meeting of the Board of Trustees of said company, held on the 18th day of January, 1873, an assessment of fifty dollars (\$50) per share was levied upon the capital stock of said company, payable immediately in gold coin of the United States, to the Secretary at the office of said company, No. 302 Montgomery street, San Francisco, California. Any shares upon which said assessment shall remain unpaid on Wednesday, March 15th, 1873, shall be deemed delinquent, and will be sold at public auction, and unless payment shall be made before, will be sold on Monday, the 24th day of March, 1873, to pay the delinquent assessment, together with costs of advertising and expenses of sale. By order of the Board of Trustees.

WM. H. WATSON, Secretary.

Office, Room 5 and 6, No. 302 Montgomery street, San Francisco, Cal. te23

Imperatrice Eugenie Gold and Silver Mining Company.—Location of principal place of business, San Francisco, California. Location of works, Blue Mountain, Calaveras county, California.

NOTICE is hereby given, that at a meeting of the Board of Directors, held on the fifteenth day of February, A. D. 1873, an assessment of five cents per share was levied upon the capital stock of the corporation, payable immediately in United States gold coin, to the Secretary, at the office of the company, 712 and 714 Washington street, San Francisco, California.

Any stock upon which said assessment shall remain unpaid on Saturday, March 23d, 1873, will be delinquent, and advertised for sale at public auction, and unless payment shall be made before, will be sold on Tuesday, the 24th day of April, 1873, to pay the delinquent assessment, together with costs of advertising and expenses of sale. By order of Board of Directors.

GUSTAVE BERSON, Secretary.

Office, 712 and 714 Washington street, San Francisco, Cal. te22

Keystone No. One and Two Gold and Silver Mining Company.—Place of business, No. 507 Montgomery street, San Francisco, California. Location of works, Wallapai Mining District, Mohave County, Territory.

NOTICE is hereby given, that at a meeting of the Board of Directors, held on the 10th day of March, 1873, an assessment of twenty-five (25) cents per share was levied upon the capital stock of the corporation, payable immediately in gold coin, to the Secretary, at the office of the company, No. 507 Montgomery street, San Francisco, Cal.

Any stock upon which said assessment shall remain unpaid on the fifteenth (15th) day of April, 1873, will be delinquent, and advertised for sale at public auction, and unless payment is made before, will be sold on the fifth (5th) day of May, 1873, to pay the delinquent assessment, together with costs of advertising and expenses of sale. By order of the Board of Directors.

T. E. JEWELL, Secretary.

Office, No. 507 Montgomery street, San Francisco, Cal.

Hardy Coal Mining Company—Location

of principal place of business, San Francisco, Cal. NOTICE.—There are delinquent upon the following described stock, on account of assessment levied on the twenty-eighth day of January, 1873, the several amounts set opposite the names of the respective shareholders as follows:

Names.	No. Certificate.	No. Shares.	Amount.
Warren Goodale.....	37 old	94	\$1,069 55
Edward McLean.....	6 new	41	41 00
Edward McLean.....	23 new	50	60 00
Edward McLean.....	24 new	150	150 00
Edward McLean.....	37 new	46	46 00
Jacob Hardy.....	12 new	10	10 00
Jacob Hardy.....	21 new	85	85 00
Jacob Hardy.....	26 old	1	12 00
Jacob Hardy.....	28 old	1	12 00

And in accordance with law, and an order of the Board of Trustees, made on the 28th day of January, 1873, so many shares of each parcel of said stock as may be necessary, will be sold at public auction, at the company's office, room 6, No. 338 Montgomery street, San Francisco, on the 24th day of March, 1873, the hour of 12 o'clock m., of said day, to pay delinquent assessment thereon, together with costs of advertising and expenses of sale.

JACOB HARDY, Secretary pro tem.

Office—Room 6, No. 338 Montgomery street, San Francisco, Cal. m15-3t

Meadow Valley East Extension M. Co.—

Location of principal place of business, 419 California street, San Francisco, California. Location of works, Ely District, Lincoln County, Nevada.

NOTICE.—There is delinquent on the following described stock, on account of assessment (No. 2) levied on the 14th day of January, 1873, the several amounts set opposite the names of the respective shareholders, as follows:

Names.	No. Certificate.	No. Shares.	Amount.
Boyd & Davis, Trustees.....	1	60	\$ 6 00
Boyd & Davis, Trustees.....	371	50	5 00
Boyd & Davis, Trustees.....	482	25	2 50
Bayerque, R.....	149	30	3 00
Bayerque, R.....	354	100	10 00
Bridges, J. G.....	307	10	1 00
Buckley, J. O.....	224	22 1/2	2 25
Boyd, Theodore C.....	525	100	10 00
Bidleman, H. J.....	551	125	12 50
Benson, Jno.....	376	100	10 00
Boulanger, P.....	498	25	2 50
Cope, G. W. Trustee.....	589	50	5 00
Cavallier, J. P. Trustee.....	80	10	1 00
Cartwright, Jno.....	446	10	1 00
Christie, Antonio.....	617	50	5 00
Cady, A. M. Trustee.....	623	17 1/2	1 75
De Solla, J. M.....	688	50	5 00
Eyre, E. E. Trustee.....	521	25	2 50
Eyre, E. E. Trustee.....	622	12 1/2	1 25
Field, Wm A.....	102	10	1 00
Forbes, Alex. Trustee.....	436	21 1/2	2 15
Forbes, Alex. Trustee.....	442	10	1 00
Forbes, O. S. Trustee.....	549	125	12 50
Giazler & Seligsberg, Trustees.....	26	40	4 00
Giazler & Seligsberg, Trustees.....	317	25	2 50
Giazler & Seligsberg, Trustees.....	392	50	5 00
Grimes, N. E. Trustee.....	344	50	5 00
Gould, C. G.....	162	10	1 00
Hoffman, Ogden.....	443	500	50 00
Hoffman, Ogden.....	407	25	2 50
Hathorn, H. W.....	572	26	2 50
Hathorn, H. W.....	608	76	7 50
Koehler, W. G.....	168	16	1 60
Koenig, A.....	384	37 1/2	3 75
Lissak, L. S. Trustee.....	600	25	2 50
Lincoln, Jerome.....	376	75	7 50
Lazard, J. D.....	107	10	1 00
Marina, E. J. Trustee.....	405	25	2 50
Marina, E. J. Trustee.....	19	10	1 00
Marina, E. J. Trustee.....	140	26	2 60
Marina, E. J. Trustee.....	559	100	10 00
Marina, E. J. Trustee.....	660	25	2 50
Marina, E. J. Trustee.....	561	100	10 00
Marina, E. J. Trustee.....	562	100	10 00
Marina, E. J. Trustee.....	563	100	10 00
Mow, J. A.....	34	10	1 00
Mayers, H. Trustee.....	164	20	2 00
Morton, Jno.....	608	400	40 00
Moret, C.....	160	40	4 00
Mezard, Victorine E.....	173	50	5 00
Minturn, W. B. Trustee.....	204	10	1 00
McKenna, H.....	276	15	1 50
Reid, W. M.....	365	32 1/2	3 25
Pioche, F. L. A. Trustee.....	374	732 1/2	73 25
Rose, L. S. Trustee.....	13	50	5 00
Rose, L. S. Trustee.....	182	37 1/2	3 75
Roche, Thos.....	155	87 1/2	8 75
Rourke, J. W. Trustee.....	341	12 1/2	1 25
Reiff, Louis.....	106	10	1 00
Rudelsack, M.....	183	25	2 50
Richardson, E. A. Trustee.....	28	50	5 00
Richardson, E. A. Trustee.....	50	26	2 50
Richardson, E. A. Trustee.....	68	12 1/2	1 25
Richardson, E. A. Trustee.....	69	45	4 50
Richardson, E. A. Trustee.....	106	50	5 00
Richardson, E. A. Trustee.....	109	10	1 00
Richardson, E. A. Trustee.....	129	10	1 00
Richardson, E. A. Trustee.....	130	10	1 00
Richardson, E. A. Trustee.....	167	25	2 50
Richardson, E. A. Trustee.....	169	50	5 00
Richardson, E. A. Trustee.....	193	25	2 50
Richardson, E. A. Trustee.....	194	25	2 50
Richardson, E. A. Trustee.....	212	15	1 50
Richardson, E. A. Trustee.....	283	50	5 00
Richardson, E. A. Trustee.....	284	50	5 00
Richardson, E. A. Trustee.....	318	10	1 00
Richardson, E. A. Trustee.....	325	500	50 00
Richardson, E. A. Trustee.....	363	96	9 50
Richardson, E. A. Trustee.....	377	125	12 50
Richardson, E. A. Trustee.....	380	10	1 00
Richardson, E. A. Trustee.....	407	25	2 50
Richardson, E. A. Trustee.....	426	12 1/2	1 25
Richardson, E. A. Trustee.....	539	25	2 50
Richardson, E. A. Trustee.....	558	200	20 00
Richardson, E. A. Trustee.....	686	800	80 00
Richardson, E. A. Trustee.....	688	50	5 00
Richardson, E. A. Trustee.....	615	200	20 00
Richardson, E. A. Trustee.....	616	100	10 00
Richardson, E. A. Trustee.....	617	100	10 00</

Ohio Consolidated Gold Mining Company.
Location of works, West Point, Calaveras County, California. Principal place of business, San Francisco.
Notice is hereby given, that at a meeting of the Board of Directors of said company, held on the 13th day of February, 1873, an assessment of ten cents per share was levied upon the capital stock of the corporation, payable immediately in United States gold coin, to the Secretary, at the office of the company, No. 321 Montgomery street, San Francisco, California.
Any stock upon which said assessment shall remain unpaid on the 15th day of March, 1873, will be delinquent, and advertised for sale at public auction, and unless payment shall be made before, will be sold on Saturday, the 5th day of April, 1873, to pay the delinquent assessments, together with costs of advertising and expenses of sale. By order of the Board of Directors.
W. A. G. KNAPP, Secretary.
Office, 421 Montgomery Street, over Dunham & Kelly's Bank, San Francisco, California.

Rail Road Consolidated Mining Company.
Location of principal place of business, Room 10, No. 323 Montgomery street, San Francisco, California.
Location of works, Railroad District, Elko County, State of Nevada.
Notice is hereby given, that at a meeting of the Board of Directors of said company, held on the 13th day of February, 1873, an assessment of ten cents per share was levied upon the capital stock of the corporation, payable immediately in United States gold coin, to the Secretary, at the office of the company, No. 323 Montgomery street, San Francisco, California.
Any stock upon which said assessment shall remain unpaid on the 15th day of March, 1873, will be delinquent, and advertised for sale at public auction, and unless payment shall be made before, will be sold on Saturday, the 5th day of April, 1873, to pay the delinquent assessments, together with costs of advertising and expenses of sale. By order of the Board of Directors.
W. A. G. KNAPP, Secretary.
Office, 421 Montgomery Street, over Dunham & Kelly's Bank, San Francisco, California.

Names.	No. Certificate.	No. Shares.	Amount.
Burke, S. S.	40	100	\$15 00
Burke, S. S.	92	200	30 00
Burke, S. S.	93	25	3 75
Burke, S. S.	95	1500	225 00
Burke, S. S.	96	500	75 00
Burke, S. S.	97	25	3 75
Burke, S. S.	98	25	3 75
Burke, S. S.	99	25	3 75
Burke, S. S.	100	25	3 75
Burke, S. S.	101	25	3 75
Burke, S. S.	102	25	3 75
Burke, S. S.	103	25	3 75
Burke, S. S.	104	25	3 75
Burke, S. S.	105	25	3 75
Burke, S. S.	106	25	3 75
Burke, S. S.	107	25	3 75
Burke, S. S.	108	25	3 75
Burke, S. S.	109	25	3 75
Burke, S. S.	110	25	3 75
Burke, S. S.	111	25	3 75
Burke, S. S.	112	25	3 75
Burke, S. S.	113	25	3 75
Burke, S. S.	114	25	3 75
Burke, S. S.	115	25	3 75
Burke, S. S.	116	25	3 75
Burke, S. S.	117	25	3 75
Burke, S. S.	118	25	3 75
Burke, S. S.	119	25	3 75
Burke, S. S.	120	25	3 75
Burke, S. S.	121	25	3 75
Burke, S. S.	122	25	3 75
Burke, S. S.	123	25	3 75
Burke, S. S.	124	25	3 75
Burke, S. S.	125	25	3 75
Burke, S. S.	126	25	3 75
Burke, S. S.	127	25	3 75
Burke, S. S.	128	25	3 75
Burke, S. S.	129	25	3 75
Burke, S. S.	130	25	3 75
Burke, S. S.	131	25	3 75
Burke, S. S.	132	25	3 75
Burke, S. S.	133	25	3 75
Burke, S. S.	134	25	3 75
Burke, S. S.	135	25	3 75
Burke, S. S.	136	25	3 75
Burke, S. S.	137	25	3 75
Burke, S. S.	138	25	3 75
Burke, S. S.	139	25	3 75
Burke, S. S.	140	25	3 75
Burke, S. S.	141	25	3 75
Burke, S. S.	142	25	3 75
Burke, S. S.	143	25	3 75
Burke, S. S.	144	25	3 75
Burke, S. S.	145	25	3 75
Burke, S. S.	146	25	3 75
Burke, S. S.	147	25	3 75
Burke, S. S.	148	25	3 75
Burke, S. S.	149	25	3 75
Burke, S. S.	150	25	3 75
Burke, S. S.	151	25	3 75
Burke, S. S.	152	25	3 75
Burke, S. S.	153	25	3 75
Burke, S. S.	154	25	3 75
Burke, S. S.	155	25	3 75
Burke, S. S.	156	25	3 75
Burke, S. S.	157	25	3 75
Burke, S. S.	158	25	3 75
Burke, S. S.	159	25	3 75
Burke, S. S.	160	25	3 75
Burke, S. S.	161	25	3 75
Burke, S. S.	162	25	3 75
Burke, S. S.	163	25	3 75
Burke, S. S.	164	25	3 75
Burke, S. S.	165	25	3 75
Burke, S. S.	166	25	3 75
Burke, S. S.	167	25	3 75
Burke, S. S.	168	25	3 75
Burke, S. S.	169	25	3 75
Burke, S. S.	170	25	3 75
Burke, S. S.	171	25	3 75
Burke, S. S.	172	25	3 75
Burke, S. S.	173	25	3 75
Burke, S. S.	174	25	3 75
Burke, S. S.	175	25	3 75
Burke, S. S.	176	25	3 75
Burke, S. S.	177	25	3 75
Burke, S. S.	178	25	3 75
Burke, S. S.	179	25	3 75
Burke, S. S.	180	25	3 75
Burke, S. S.	181	25	3 75
Burke, S. S.	182	25	3 75
Burke, S. S.	183	25	3 75
Burke, S. S.	184	25	3 75
Burke, S. S.	185	25	3 75
Burke, S. S.	186	25	3 75
Burke, S. S.	187	25	3 75
Burke, S. S.	188	25	3 75
Burke, S. S.	189	25	3 75
Burke, S. S.	190	25	3 75
Burke, S. S.	191	25	3 75
Burke, S. S.	192	25	3 75
Burke, S. S.	193	25	3 75
Burke, S. S.	194	25	3 75
Burke, S. S.	195	25	3 75
Burke, S. S.	196	25	3 75
Burke, S. S.	197	25	3 75
Burke, S. S.	198	25	3 75
Burke, S. S.	199	25	3 75
Burke, S. S.	200	25	3 75

And in accordance with law, and an order of the Board of Directors, made on the 15th day of January, 1873, so many shares of each parcel of such stock as may be necessary will be sold at public auction, at the office of the company, No. 323 Montgomery street, San Francisco, California, on Tuesday, the 26th day of March, 1873, at the hour of 1 o'clock P. M. of said day, to pay delinquent assessments thereon, together with costs of advertising and expenses of sale.
JOSEPH P. NOURSE, Secretary.
Office, 326 Montgomery Street, San Francisco, California. Room No. 10.

Stanford Silver Mining Company.—Location of works: Sierra District, Humboldt County, State of Nevada.
Notice.—There are delinquent upon the following described stock, on account of assessment (No. 1) levied on the 3d day of January, 1873, the several amounts set opposite the name of the respective shareholders as follows:
Names. No. Certificate. No. Shares. Amount.
Barnes, F. W. 69 1000 100 00
Barnes, F. W. 70 1000 100 00
Barnes, F. W. 71 1000 100 00
Barnes, F. W. 72 500 50 00
Barnes, F. W. 73 500 50 00
Barnes, F. W. 74 100 10 00
Barnes, F. W. 75 100 10 00
Barnes, F. W. 76 100 10 00
Barnes, F. W. 77 100 10 00
Comins, Thomas. 106 100 10 00
Comins, Thomas. 109 100 10 00
Comins, Thomas. 125 25 2 50
Clapp, G. W. Trustee. 25 50 6 00
Clapp, G. W. Trustee. 26 50 6 00
Clapp, G. W. Trustee. 101 100 10 00
Clapp, G. W. Trustee. 102 100 10 00
Clapp, G. W. Trustee. 103 60 5 00
Fish, Chas H. Trustee. 92 100 10 00
Fish, Chas H. Trustee. 97 100 10 00
Fish, Chas H. Trustee. 128 100 10 00
Fish, Chas H. Trustee. 129 100 10 00
Fish, Chas H. Trustee. 130 100 10 00
Fish, Chas H. Trustee. 131 100 10 00
Fish, Chas H. Trustee. 132 100 10 00
Huff, S. 46 100 10 00
Huff, S. 47 100 10 00
Huff, S. 49 100 10 00

Names.	No. Certificate.	No. Shares.	Amount.
Huff, S.	50	100	10 00
Huff, S.	51	100	10 00
Huff, S.	52	100	10 00
Huff, S.	53	100	10 00
Huff, S.	54	100	10 00
Huff, S.	55	100	10 00
Huff, S.	56	100	10 00
Huff, S.	57	100	10 00
Huff, S.	58	100	10 00
Huff, S.	59	100	10 00
Huff, S.	60	100	10 00
Huff, S.	61	100	10 00
Huff, S.	62	100	10 00
Huff, S.	63	100	10 00
Huff, S.	64	100	10 00
Huff, S.	65	100	10 00
Huff, S.	66	100	10 00
Huff, S.	67	100	10 00
Huff, S.	68	100	10 00
Huff, S.	69	100	10 00
Huff, S.	70	100	10 00
Huff, S.	71	100	10 00
Huff, S.	72	100	10 00
Huff, S.	73	100	10 00
Huff, S.	74	100	10 00
Huff, S.	75	100	10 00
Huff, S.	76	100	10 00
Huff, S.	77	100	10 00
Huff, S.	78	100	10 00
Huff, S.	79	100	10 00
Huff, S.	80	100	10 00
Huff, S.	81	100	10 00
Huff, S.	82	100	10 00
Huff, S.	83	100	10 00
Huff, S.	84	100	10 00
Huff, S.	85	100	10 00
Huff, S.	86	100	10 00
Huff, S.	87	100	10 00
Huff, S.	88	100	10 00
Huff, S.	89	100	10 00
Huff, S.	90	100	10 00
Huff, S.	91	100	10 00
Huff, S.	92	100	10 00
Huff, S.	93	100	10 00
Huff, S.	94	100	10 00
Huff, S.	95	100	10 00
Huff, S.	96	100	10 00
Huff, S.	97	100	10 00
Huff, S.	98	100	10 00
Huff, S.	99	100	10 00
Huff, S.	100	100	10 00
Huff, S.	101	100	10 00
Huff, S.	102	100	10 00
Huff, S.	103	100	10 00
Huff, S.	104	100	10 00
Huff, S.	105	100	10 00
Huff, S.	106	100	10 00
Huff, S.	107	100	10 00
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Huff, S.	123	100	10 00
Huff, S.	124	100	10 00
Huff, S.	125	100	10 00
Huff, S.	126	100	10 00
Huff, S.	127	100	10 00
Huff, S.	128	100	10 00
Huff, S.	129	100	10 00
Huff, S.	130	100	10 00
Huff, S.	131	100	10 00
Huff, S.	132	100	10 00
Huff, S.	133	100	10 00
Huff, S.	134	100	10 00
Huff, S.	135	100	10 00
Huff, S.	136	100	10 00
Huff, S.	137	100	10 00
Huff, S.	138	100	10 00
Huff, S.	139	100	10 00
Huff, S.	140	100	10 00
Huff, S.	141	100	10 00
Huff, S.	142	100	10 00
Huff, S.	143	100	10 00
Huff, S.	144	100	10 00
Huff, S.	145	100	10 00
Huff, S.	146	100	10 00
Huff, S.	147	100	10 00
Huff, S.	148	100	10 00
Huff, S.	149	100	10 00
Huff, S.	150	100	10 00
Huff, S.	151	100	10 00
Huff, S.	152	100	10 00
Huff, S.	153	100	10 00
Huff, S.	154	100	10 00
Huff, S.	155	100	10 00
Huff, S.	156	100	10 00
Huff, S.	157	100	10 00
Huff, S.	158	100	10 00
Huff, S.	159	100	10 00
Huff, S.	160	100	10 00
Huff, S.	161	100	10 00
Huff, S.	162	100	10 00
Huff, S.	163	100	10 00
Huff, S.	164	100	10 00
Huff, S.	165	100	10 00
Huff, S.	166	100	10 00
Huff, S.	167	100	10 00
Huff, S.	168	100	10 00
Huff, S.	169	100	10 00
Huff, S.	170	100	10 00
Huff, S.	171	100	10 00
Huff, S.	172	100	10 00
Huff, S.	173	100	10 00
Huff, S.	174	100	10 00
Huff, S.	175	100	10 00
Huff, S.	176	100	10 00
Huff, S.	177	100	10 00
Huff, S.	178	100	10 00
Huff, S.	179	100	10 00
Huff, S.	180	100	10 00
Huff, S.	181	100	10 00
Huff, S.	182	100	10 00
Huff, S.	183	100	10 00
Huff, S.	184	100	10 00
Huff, S.	185	100	10 00
Huff, S.	186	100	10 00
Huff, S.	187	100	10 00
Huff, S.	188	100	10 00
Huff, S.	189	100	10 00
Huff, S.	190	100	10 00
Huff, S.	191	100	10 00
Huff, S.	192	100	10 00
Huff, S.	193	100	10 00
Huff, S.	194	100	10 00
Huff, S.	195	100	10 00
Huff, S.	196	100	10 00
Huff, S.	197	100	10 00
Huff, S.	198	100	10 00
Huff, S.	199	100	10 00
Huff, S.	200	100	10 00

And in accordance with law, and an order of the Board of Directors, made on the 15th day of January, 1873, so many shares of each parcel of such stock as may be necessary will be sold at public auction, at the office of the company, No. 323 Montgomery street, San Francisco, California, on Tuesday, the 26th day of March, 1873, at the hour of 1 o'clock P. M. of said day, to pay delinquent assessments thereon, together with costs of advertising and expenses of sale.
CHAS. H. FISH, Secretary.
Office, Room 26, Hayward's Building, 419 California Street, San Francisco, California. fls-3t

State of Maine Mill and Mining Company.—Location of principal place of business, San Francisco, California. Location of works, Amador County, California.
Notice.—There are delinquent upon the following described stock, on account of assessment (No. 2) levied on the 23rd day of January, 1873, the several amounts set opposite the names of the respective shareholders as follows:
Names. No. Certificate. No. Shares. Amount.
W. H. Higgins. 7 1000 500 00
Wm Adams. 7 1000 25 00
S L Marks. Trustee. 12 240 12 00
S L Marks. Trustee. 13 240 12 00
S L Marks. Trustee. 21 600 25 00
L N Tower. 26 100 5 00
Platte Burr. Trustee. 30 60 3 00
A O Morris. Trustee. 42 500 20 00
H B Congdon. Trustee. 62 100 5 00
H B Congdon. Trustee. 63 100 5 00
H B Congdon. Trustee. 64 100 5 00
H B Congdon. Trustee. 65 100 5 00
H B Congdon. Trustee. 66 100 5 00
H B Congdon. Trustee. 67 100 5 00
H B Congdon. Trustee. 68 100 5 00
H B Congdon. Trustee. 69 100 5 00
H B Congdon. Trustee. 70 100 5 00
H B Congdon. Trustee. 7

Machine Builders.

ESTABLISHED 1851.

PACIFIC IRON WORKS,

First and Fremont streets,

SAN FRANCISCO

IRA P. HANKIN, A. P. BRAYTON,
GEO. W. FOGG, Superintendent.

Steam Engines and Boilers,

MARINE AND STATIONARY,

IRON AND BRASS CASTINGS

Mining Machinery of Every Description,

And all other classes of work generally done at first-class establishments, manufactured by us at the lowest prices, and of the best quality.

Particular attention paid to Jobbing Work and Repairs.
N. B.—Sole Agents for sale of HUNTOON'S CELEBRATED PATENT GOVERNOR.
1872-3m GODDARD & CO.

FULTON

Foundry and Iron Works.

HINCKLEY & CO.,

MANUFACTURERS OF

TEAM ENGINES,

Quartz, Flour and Saw Mills,

uses Improved Steam Pump, Brodie's Improved Crusher, Mining Pumps, Amalgamators, and all kinds of Machinery.

N. E. corner of Tehama and Fremont streets, above Howard street, San Francisco. 3-qv.

GEORGE T. PRACY, MACHINE WORKS,

109 and 111 Mission Street,

SAN FRANCISCO.

These Works have lately been increased, by additional Tools, and we are now able to turn out any kind of work, equal to and cheaper than any establishment in the State; that is to say—

STEAM ENGINES,

Flour and Saw Mills,

QUARTZ MACHINERY

Printing Presses,

AND MACHINERY MADE OF EVERY DESCRIPTION.

Improved Safety Store Hoists,

Fitted with Cutting's Patent Cams, unequalled for safety, convenience and cheapness. This Hoist can be built for about half the price of any other in use. To be seen at HAWLEY & CO.'S.

ALSO, MANUFACTURER AND SOLE AGENT FOR
Pracy's Celebrated Governor.

TURNING LATHES, Etc., constantly on hand.
4v28it

UNION IRON WORKS,

Sacramento.

ROOT, NEILSON & CO.,

MANUFACTURERS OF

STEAM ENGINES, BOILERS,

CROSS' PATENT BOILER FEEDER AND SEDIMENT

COLLECTOR

Dunbar's Patent Self-Adjusting Steam Piston Packing, for new and old Cylinders.

And all kinds of Mining Machinery.

Front Street, between N and O streets,

SACRAMENTO CITY.

PACIFIC

Rolling Mill Company,

SAN FRANCISCO, CAL.

Established for the Manufacture of

RAILROAD AND OTHER IRON

—AND—

Every Variety of Shafting,

Embracing ALL SIZES of

Steamboat Shafts, Cranks, Piston and Connecting Rods, Car and Locomotive Axles

and Frames

HAMMERED IRON

Of every description and size.

Orders addressed to PACIFIC ROLLING MILL COMPANY, P. O. Box 202, San Francisco, Cal., will receive prompt attention.

The highest price paid for Scrap Iron. 9v143

THE RISDON Iron and Locomotive Works.

INCORPORATED.....APRIL 30, 1863.

CAPITAL.....\$1,000,000

LOCATION OF WORKS:
Corner of Beale and Howard Streets,
SAN FRANCISCO.

Manufacturers of Steam Engines, Quartz and Flour Mill Machinery, Steam Boilers (Marine, Locomotive and Stationary), Marine Engines (High and Low Pressure). All kinds of light and heavy Castings at lowest prices. Cams and Tappets, with chilled faces, guaranteed 40 per cent. more durable than ordinary iron.

Directors: Joseph Moore, C. J. Brenham, O. E. McLane, Wm. Norris, Wm. H. Taylor, Lloyd Tevis, James D. Walker.

WM. H. TAYLOR.....President
JOSEPH MOORE.....Vice-President and Superintendent
LEWIS R. MEAD.....Secretary

GEO. W. PRESCOTT.....C. W. SCHEIDEL.....W. R. ECKART

PRESCOTT, SCHEIDEL & CO., MARYSVILLE FOUNDRY.

Corner of B and Fourth streets, Marysville, Cal.

MANUFACTURERS OF

STEAM ENGINES,

STATIONARY AND PORTABLE

SAW AND GRIST MILLS,

Hydraulic Machinery,

Quartz Crushing and Amalgamating Machinery

Of every description, constantly on hand.

Plans and estimates furnished upon application. Repairs upon all kinds of Machinery promptly made, and at moderate charges.

Having unrivalled facilities, we are prepared to make to order, at short notice, anything required in our line. Specimens of our work may be seen in all the mining regions on this coast.

OCCIDENTAL FOUNDRY,

137 and 139 First st., near the Gas Works, San Francisco.

STEIGER & BOLAND,

IRON FOUNDERS.

IRON CASTINGS of all descriptions at short notice. All orders punctually executed in time agreed on. Particular attention paid to making superior Shoes and Dies. Among the special castings of this Foundry are the well known CALLAHAN GRATE BAR, of superior merit for burning screenings—all size Bars. STRATTON'S JACQ SCREWS, all sizes. Superior, compact and effective Horse Powers, Pumps, Agricultural Castings, Ingot Moulds, Assaying and Refining Retorts and Kettles, and a great variety of other and special castings.

STEIGER & BOLAND Proprietors.

Steiger & Boland are the sole Manufacturers of the Improved Hepburn Roller Pan. The patterns having all the improvements to those Pans, are at the Occidental Foundry, enabling the Establishment to deliver all pans and parts thereof with uniformity, finished in the best style, and at the lowest possible price. Pan Castings furnished the trade, with liberal facilities for erection, Etc. All persons are cautioned against making, selling or using these Pans, except through the authorized agents and manufacturers, viz., Steiger & Boland, of the Occidental Foundry, S. F.

22v25-3m

WM. H. HEPBURN.

A. HANKE'S

IRON FOUNDRY,

CORNER MAIN AND HARRISON STREETS,

Entrance on Main Street.....San Francisco.

Every Description of Ornamental Work, Stove and French Range Work, grate and fender work, small machines of all descriptions, house work, etc., promptly attended to.
25v25-3m

CALIFORNIA BRASS FOUNDRY,

No. 125 First street, opposite Minna,

SAN FRANCISCO.

ALL KINDS of Brass, Composition, Zinc, and Babbitt Metal Castings, Brass Ship Work of all kinds, Spikes, Sheathing Nails, Rudder Braces, Hinges, Ship and Steamboat Bellows and Gongs of superior tone. All kinds of Cocks and Valves, Hydraulic Pipes and Nozzles, and Hose Couplings and Connections of all sizes and patterns, furnished with dispatch.
PRICES MODERATE.
J. H. WEED.....V. KINGWELL

THOMPSON BROTHERS,

EUREKA FOUNDRY,

123 and 131 Beale street, between Mission and Howard,

San Francisco.

LIGHT AND HEAVY CASTINGS,

of every description, manufactured. 24v16qr

Miners' Foundry and Machine Works,

CO-OPERATIVE,

First Street, bet. Howard and Folsom, SAN FRANCISCO

Machinery and Castings of all kinds.

Notice is hereby given, that the copartnership heretofore existing between A. J. Severance, Charles W. Randall and J. Gus. Burt, under the firm name of "Severance, Holt & Co.," is this day dissolved by mutual consent. A. J. Severance, having purchased all the interest of his late partners, will continue the business of manufacturing and selling Diamond Drills as before, under the style of A. J. Severance & Co. Dated San Francisco, Nov. 24, 1871.
A. J. SEVERANCE,
CHAS. H. RANDALL,
J. GUS. BURT.

THEODORE KALLENBERG,

MACHINIST,

and Maker of Models for Inventors. All kinds of Dies Stamps and Punches made. Also, all kinds of Small Gears Cut.
Repairing done on very Reasonable Terms and in the best manner. No. 32 Fremont street, S. F. 19v23-3m

The California Powder Works

No. 314 CALIFORNIA STREET,

SAN FRANCISCO.

Manufacturers and have constantly on hand

SPORTING,

MINING,

And BLASTING

POWDER,

Of SUPERIOR QUALITY, FRESH FROM THE MILLS. It being constantly received and transported into the interior, is delivered to the consumer within a few days of the time of its manufacture, and is in every way superior to any other Powder in Market. We have been awarded successively

Three Gold Medals

By the MECHANICS' INSTITUTE and the STATE AGRICULTURAL SOCIETY for the superiority of our products over all others.

We also call attention to our

HERCULES POWDER.

Which combines all the force of other strong explosive now in use, and the lifting force of the BEAR BLASTING POWDER, thus making it vastly superior to any other compound now in use.

A circular containing a full description of this Powder can be obtained on application to our Office.

16v20-3m

JOHN F. LOHSE, Secretary.

BURLEIGH

ROCK DRILLS

—AND—

Air Compressors.

The Burleigh Rock Drills, which have stood the test of five years' constant use at the Hoosac Tunnel, and which are now in use in nearly every State in the Union, as well as in Europe and South America, are unequalled in efficiency and economy by any other Drilling Machine. They are of various sizes, and equally well adapted to Tunneling, Shafing, Open Cut or Quarrying, and will drill six to ten inches per minute in granite. They are driven by steam above ground. The Burleigh Air Compressor is the best engine yet devised for furnishing the "air motor" for the many purposes to which it is now being used.

They are to be used on the St. Gothard Tunnel, Switzerland; Tunnel 13 miles long. We refer to the following gentlemen and works:

Gen. Newton, U. S. A. Hell Gate Tunnel, L. I.
Mess. Shanley Hoosac Tunnel, Mass.
J. Dutton Steele Nesquehoning Tunnel, Pa.
Sidney Dillon Fourth Avenue Work, N. Y.
Col. Roebing East River Bridge Company, N. Y.

For further information, etc., address

L. C. PARKE,

VIRGINIA CITY, NEVADA.

AGENT FOR THE PACIFIC COAST. 115

SHEET IRON PIPE.

—THE—

Risdon Iron and Locomotive Works

Corner Howard and Beale Streets,

Are prepared to make SHEET IRON AND ASPHALTUM PIPE, of any size and for any pressure, and contract to lay the same where wanted, guaranteeing a perfect working pipe with the least amount of material.

Standard sizes of railroad Car Wheels, with special patterns for Mining Cars. These small wheels are made of the best Car Wheel Iron, properly chilled, and can be fitted up with the improved axle and box—introduced by this company, and guaranteed to outlast any other wheels made in this State.

All kinds of Machinery made and repaired.

24v22-3m

JOSEPH MOORE, Superintendent.

NELSON & DOBLE,

AGENTS FOR

Thomas Firth & Sons' Cast Steel.



MANUFACTURERS OF

Sledges, Hammers, Stone

Cutters, Blacksmiths' and Horse-Shoers' Tools.



13 and 15 Fremont street, near Market, San Francisco 16v14qr

SAN FRANCISCO

SCREW BOLT WORKS,

PHELPS BROTHERS, Proprietors

MANUFACTURERS OF ALL KINDS OF

Machins Bolts, Bridge Bolts, and Ship or

Band Bolts.

18 and 16 Drumm Street, San Francisco. 4v241y

FRIEL'S PARAGON VAPOR STOVE.

PATENT APPLIED FOR.

The Great Labor Saver of the Household.

ECONOMY, CONVENIENCE AND SAFETY COMBINED.



JUST THINK OF IT—No Wood, no Coal, no Gas, no Stove Pipe, no Chimney, no Smoke, no Ashes, no Dirt, no Wood Boxes, no Coal Scuttles, no Kindling, Wood, but a Friction Match, and the Fire in Full Blast in Half a Minute!

OVEN HOT IN TWO MINUTES.

Steak broiled in seven minutes! Baked Beans in thirty minutes! The fire extinguished in a moment! And the house warmed! It has no rival in all kinds of Cooking and Flat Iron Heating, and combines Economy, Convenience, Neatness, Safety and Durability! The Ladies Welcome it; a little Child can operate it, and

ALL RECOMMEND IT.

Prices from \$6 to \$25, according to size.

Manufactured and sold by

WM. FRIEL,

69 and 71 Fourth Street, San Francisco.

426 v25-3m

RAWHIDE

BEATING ELACING ROPES & CHORDS

Made by H. ROYER

437 Brannan St. S.F.

18v4-2am-bp

Frear Artificial Stone.

THE ONLY SUCCESSFUL PATENT.

Beautiful, Cheap and Durable!

County Rights for Sale.

Address, R. WEGENER, Sec'y

FREAR STONE COMPANY, SAN FRANCISCO.

7v25-1f

WARNER & SILSBY

Manufacture all sizes of

Bed and Sofa Springs,

Which they offer to the trade at

reduced prices; also the celebrated

Overmann Self Fastening Bed Spring.

Any man can make his own Spring Bed with them by attaching them to the slats of any bedstead.

No. 147 New Montgomery Street, corner of

Natomas, San Francisco. 23v3-6m

AVERILL'S

CHEMICAL PAINT

Of any desired Shade or Color,

Mixed ready for application, and sold by the gallon.

It is Cheaper, Handsomer, more Durable and Elastic than the best of any other Paint.

Office, corner Fourth and Townsend streets, San

Francisco. Send for sample card and price list.

16v23-3m-cwhp HEALY & JEWELL, Agents.

J. M. STOCKMAN,

Manufacturer of

PATTERNS AND MODELS,

(Over W. T. Garratt's Brass Foundry.)

N. W. corner Natoma and Fremont streets, S. F. En-

trance on Natoma street. 6v23-3m

CAUTION.

Betts's Patent Capsules.

The public are respectfully cautioned that BETTS'S

Patent Capsules are being infringed

BETTS'S name is upon every Capsule he makes for the leading

Merchants at home and abroad, and he is the ONLY INVENTOR and SOLE MAKER in

the United Kingdom.

MANUFACTORIES—1, WHARF-Road, CITY-ROAD, LONDON

AND BORDEAUX, FRANCE.

MONTGOMERY'S HOTEL,

227 and 229 Second street,.....SAN FRANCISCO.

This Hotel has been newly furnished, and is situated in a

central and healthy location, and is one of the few

Hotels in San Francisco conducted on

Temperance Principles.

BOARD, PER WEEK, \$3.50. BOARD AND LODGING, \$4 to \$5.

SIX MEAL TICKETS FOR \$1.

CHAS. MONTGOMERY, Proprietor.

Passengers and Baggage taken to the Hotel free.

5v26-awbp

SELL YOUR PATENTS

Through WHESTER & Co., 17 New Montgomery street,

SAN FRANCISCO, CAL.

Root's Safety Boilers.



IMPROVED AND PERFECTED

— BY —
FIVE YEARS' EXPERIENCE.

And the Sale of Nearly 800 Boilers,
For all manner of uses.
Send for Circular, and for further information address

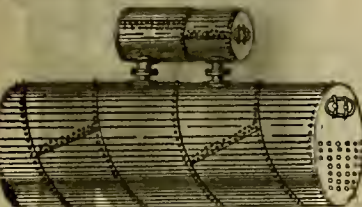
L. C. PARKE,
Virginia City, Nevada.

San Francisco Boiler Works,

123 and 125 Beale Street.....SAN FRANCISCO.

F. I. CURRY.

(Late Foreman of the Vulcan Iron Works,) Proprietor.



High and Low Pressure Boilers of all
Descriptions.

SOLE MANUFACTURERS OF THE CELEBRATED
SPIRAL BOILER.

SHEET IRON WORK of every description done
at the shortest notice.
All kinds of JOBBING and REPAIRING promptly
attended to. 17v25-3m

Portland Boiler Works.

MOYNIHAN & AITKEN,

311 and 313 Mission St., San Francisco.

T. J. MOYNIHAN.

J. AITKEN.

High & Low Pressure Boilers

OF ALL KINDS,

Built according to Drawings or Specifications, and
SHEET IRON WORK executed at the shortest notice,
and on the most reasonable terms.

Repairing promptly attended to, and at reasonable
rates.

Agents for Robinson's Government Lock Valve.
4v26-3m

Steam Boiler Manufactory

— OF —

JAMES H. SHANLEY,

(Successor to D. McDonald.)

Oregon street, below Front.....SAN FRANCISCO.

ALL SORTS OF STEAM BOILERS

Made to order and repaired.

Also all kinds of Sheet Iron Work done promptly,
and at prices to suit the times. 25v25-3m

From the Mining Summary in the Gold Hill News of
December 28th.

The New Root Boiler

IS A PERFECT SUCCESS.

The saving in the amount of fuel consumed, alone
amounting to 30 per cent. less than the cost of running
the same machinery with the old style of Boilers.

For price list and prompt execution of orders please
address

WM. HOLDREDGE,

137 Montgomery street, San Francisco,
General Agent for the Pacific Coast.

J. W. Farren,

Wagon Maker and Blacksmith,

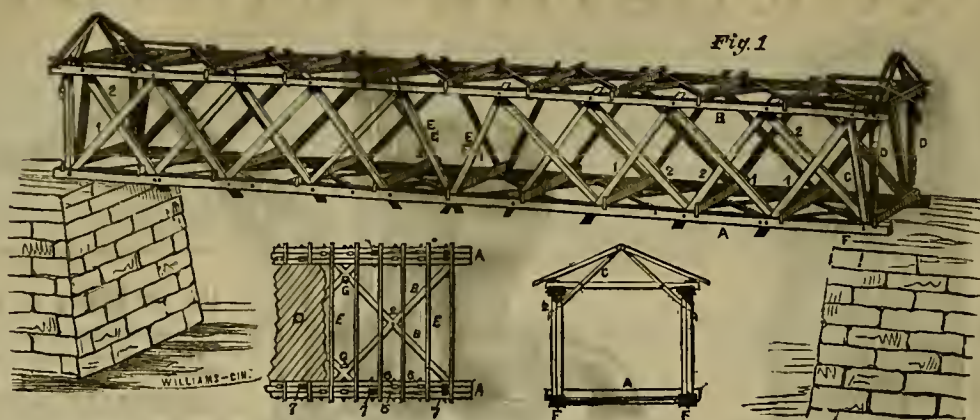
131 Beale St., between Mission and Howard,

SAN FRANCISCO.

Wagons, Trucks and Carts of every description manu-
factured to order on the shortest notice. Repairing of
all kinds promptly attended to and all work guaranteed
to give satisfaction. 4v26-3m

BUY BARBER'S BIT BRACE,

PACIFIC BRIDGE COMPANY.



WORKS NEAR SOUTH POINT MILL, BERRY STREET, SAN FRANCISCO, CAL.

Are Prepared, with Superior Machinery, to Manufacture and Build all kinds of Bridges on Smith's, Howe's, and other Improved
Plans. Framing of all kinds done by Machinery.

The Smith Bridges have been thoroughly tested in the East for Three Years, and wherever tried have proved superior to any other
Bridge in the following points:
Being built of wood entirely, they are not affected by change of temperature.
The timber used is placed so directly in the line of strain, that less material is required to support the same load.
It is not perceptibly affected by shrinkage. It is the most Economical Bridge built. It is adapted to any practicable LENGTH OF SPAN.
Plans, Specifications and Terms will be sent to any County, Township or Person wishing to build a Bridge, and no charge made unless the
Plan is used. For all Public Bridges the Plan will always be open to competition.

Smith's celebrated CAST IRON PIER, economical, and adapted to heavy currents, built at low rates.

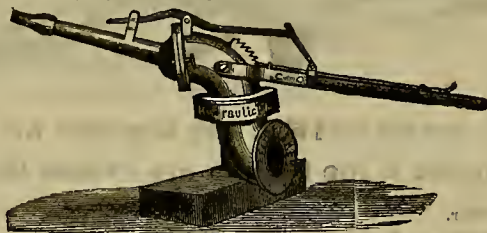
C. H. GORRILL, Secretary.

W. H. GORRILL, President.

HYDRAULIC CHIEF.

FISHER'S
KNUCKLE
JOINT
AND
NOZZLE

IS THE
Cheapest and Best
Hydraulic Machine
in use.



The only reliable party in the Hydraulic business who protects his patrons.
9v23-4t Address F. H. FISHER, Nevada, Cal.

HYDRAULIC MINERS, TAKE NOTICE—I hereby caution Miners and Manufacturers against making, buy-
ing, selling or using a Hydraulic Machine or Joint known as the Little Giant, manufactured and sold by R. R. &
J. Craig and Richard Hoskin, as the same is an infringement upon the invention of the machine known as FISHER'S
HYDRAULIC CHIEF, secured by Letters Patent, No. 110,222, dated Dec. 20, 1870. All parties participating
in such infringements will be rigorously prosecuted. Nevada, Jan. 19th.

MAOHINES
Manufactured
TO ORDER,
to throw from
One
to an
eight-inch
STREAM.

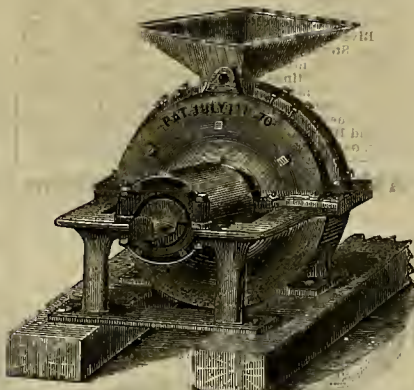
CAMERON'S

MINING STEAM PUMPS.

DAVID STODDART,

114 Beale Street, SAN FRANCISCO.

THE LIGHTNING MILL.



THE LIGHTNING MILL

For Pulverizing Quartz,

"Charleston Rock," and all Native Phosphates,
Flint, Feldspar, Iron Ore, Manganese, Antimony,
Carbon, Corundum, Old Crucibles, Barytes, Brim-
stone, Slate, Soapstone, Graphite, Glass, Marble,
Plaster, Anthracite and Bituminous Coals, etc.

WM. STEWART'S

Patent Bone Mills and
Crushers.

For Grinding Bones, Rock, Quartz, and all hard
substances; also, Corn, Wheat, Oats, Barley, Coffee,
Spices, etc.

WALKER BROS. & CO., Twenty-third and Wood Streets, Philadelphia, Sole Manufacturers of Stewart's
Celebrated Patent Bone Mills and Crushers, A. W. Straub & Co.'s Patent Revolution French Burr Mill and A.
Duval's Patent Centrifugal Pumps.

McAFEE, SPIERS & CO.,

BOILER MAKERS

AND GENERAL MACHINISTS,

Howard st., between Fremont and Beale, San Francisco

Jos. THORNHILL, 1612 Mason Street, near Green.

JOS. THORNHILL,
Bricklayer and Contractor

Particular attention paid to all kinds of FIRE WORK,
such as BOILERS, FURNACES, OVENS,
GRATES, RANGES, etc.

C. W. WHITE, 47 Clay Street.

BROWN'S PATENT LAMP.



One of these Lamps, when placed at a distance of 200
feet from the bank, will light up a bank surface 250 feet
in length and 160 feet high, and to a much better ad-
vantage than any other light heretofore tried, and at an
expense not to exceed five cents per hour. Lamps
furnished at short notice.

Letter of Recommendation.

Mr. C. B. Brown—Sir: Your Patent Lamp for light-
ing hydraulic mines, which you sold to me in December
last, has given entire satisfaction, and far exceeds my
expectations, and I think it the best and cheapest light
ever used to light mining claims by night, and am sat-
isfied that I have saved three hundred dollars by the
use of it in the last mining season over pitch or any
other light of the same brilliancy; and I will also say
that if I could not get another lamp, five hundred dol-
lars would not buy it. Yours,

W. D. APLIN.

Little York, Nov. 5, 1872.

For further particulars, address,
fe22-4t C. B. BROWN, Placerville, Cal.

P. J. PHILLIPS & CO., No. 608 Clay street, near
Montgomery, San Francisco, are agents for Brown's
Lamp, where it may be seen.

BLACK DIAMOND FILE WORKS.



G. & H. BARNETT,

Manufacturers of Files of every Description

Nos. 39, 41 and 43 Richmond street,

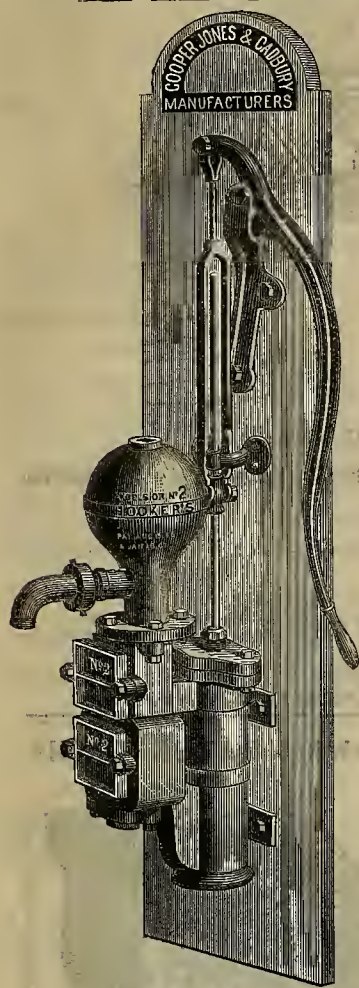
Philadelphia, Pa.

MILL SAW FILES A SPECIALTY.

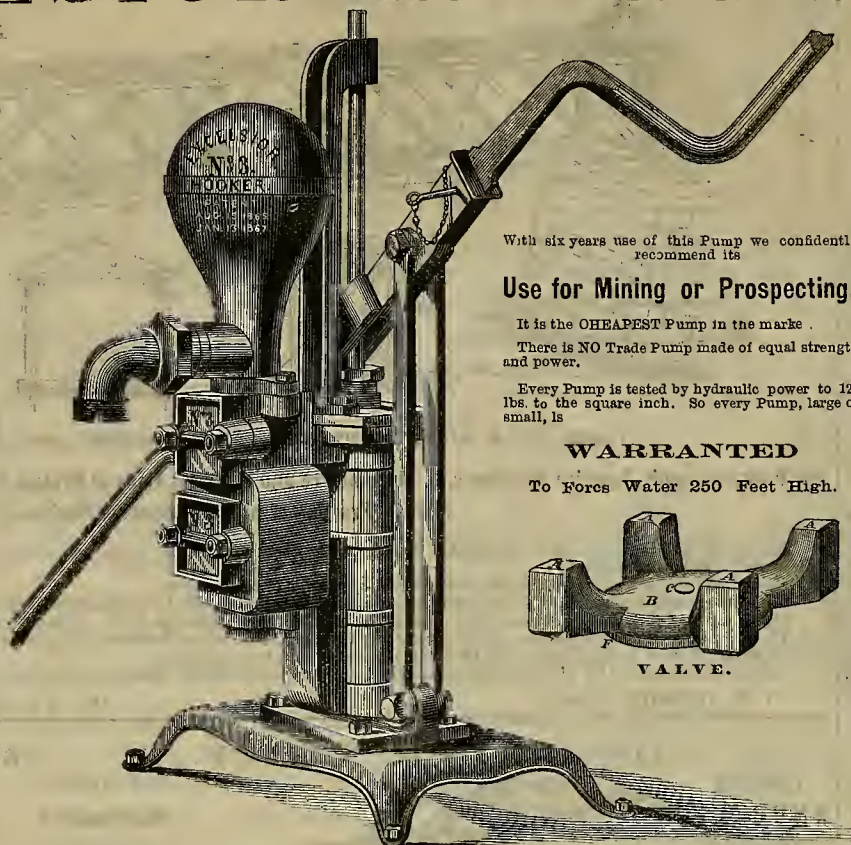
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OAKEY & SON'S EMERY AND BLACK
LEAD MILLS, Blackfriars Road, London, England.
OAKEY'S WELLINGTON KNIFE POLISH.
Packets, 3d. each; tins, 6d., 1s., 2s., 6d., and 4s. each.
OAKEY'S INDIA RUBBER KNIFE
BOARDS from 1c. each.
OAKEY'S SILVERSMITHS' SOAP (NON
MERCURIAL), for Cleansing and Polishing Silver, Elec-
tro-plate, Plate-glass, Marble, etc. Tablets, 6d. each.
OAKEY'S GENUINE EMERY, GRAIN
AND FLOUR.
OAKEY'S EMERY AND GLASS CLOTH.
OAKEY'S CABINET GLASS PAPER,
BLACK LEAD, etc.
OAKEY'S GOODS SOLD EVERYWHERE
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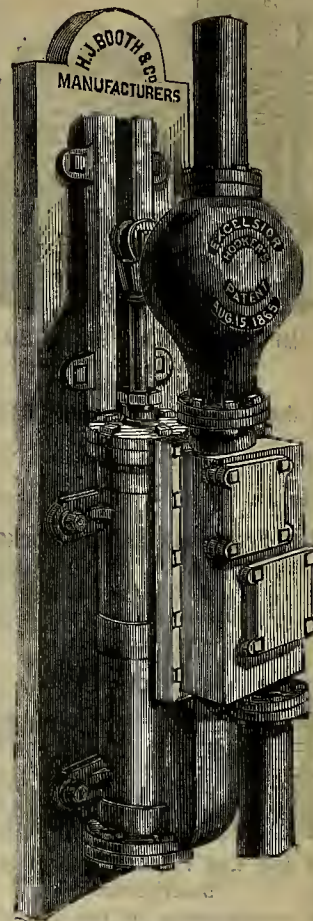
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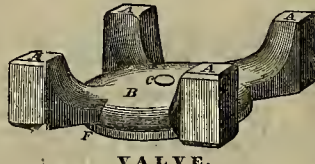
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Are now manufacturing besides the famous regular

GIANT POWDER, A NO. 2 GIANT POWDER,

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AND FOR ALL SUCH WORK WHERE THE ROCK IS NOT VERY HARD

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Patent Endless Wire Ropeway.

Covered by Numerous U. S. Patents.

IMPORTANT TO

Mining Companies, Civil Engineers, Contractors, Etc.

The system of transporting material, such as Ores, from the mine to the mill, Earths for embankments, Rock from quarries, etc., by means of steel wire rope, has been well tested and found more economical, advantageous and reliable than any other method of transportation; and to the annexed certificates in connection therewith I beg to call the attention of those interested:

EUREKA, Nevada, July 10, 1872.

T. M. MARTIN—My dear sir: On your leaving for San Francisco, it gives me great pleasure to have you my written acceptance of the HALLIDIE TRAMWAY put up by you upon our mine in Eureka.

It is a perfect success, discharging ten tons of ore per hour with two men's labor. It is perfectly simple in construction, and, as far as I can judge, there is nothing about it to ever get out of order—nothing to wear out. While our requires but about two thousand five hundred feet of wire rope, I can see no reason why the line could not be extended almost indefinitely with equally happy results. Again, the carrying capacity might be doubled or quadrupled if desired. After several weeks trial upon our mine, the unanimous verdict of all who have seen it is a complete, unquestioned success. If this can be of any service to you, use it in any way you think proper. Very respectfully, C. C. GOODWIN.

EMMA HILL CONSOLIDATED MINING CO.,

Little Cottonwood, Utah.

Superintendent's Office, Sept. 23, 1872. T. M. MARTIN, Esq., Sir: The Ropeway constructed by you (HALLIDIE'S PATENT) for the Emma Hill Consolidated Mining Company, has been built in a most substantial and workmanlike manner, and is at this time in splendid working condition. I most cheerfully accept the work for the Company, and recommend it to others wishing a sure and speedy transit for ores over places impracticable for wagon roads, etc. Respectfully, L. W. COLBATH, Superintendent.

"The Vallejo works smoothly with the elevated wire tramway, which carries its load of ore as quietly and easily as if there was no winter or snow in the world. The objections to wire tramways may be on account of their cost, I have seen nothing yet that even approaches them in the facilities they afford for moving ore at all seasons of the year."—Correspondent Utah Mining Journal, Alta, Jan. 8, 1873.

The Vallejo Ropeway.

The Vallejo Tunnel Company's Tramway in Little Cottonwood, built on the HALLIDIE PATENT PLAN, is a complete success. It is between 2300 and 2400 feet in length, and is supported by thirteen stations. The fall in this distance is about 600 feet, and the wire rope, which is three-fourths of an inch in diameter, will safely and easily deliver one hundred tons in six hours. The machinery is automatic, loading and unloading the sacks or buckets. About one ton and a half can be sent down at one time. The stations are about two hundred feet apart, and the entire apparatus is strong and safe. As the wire rope is elevated about forty feet above the surface of the hill, the Tramway can be worked all winter long, without the slightest trouble. —Utah Mining Journal, Salt Lake, Sept. 23, 1872.

Mining Companies and others desiring to negotiate for the erection of this system of Ropeway, can communicate with me personally, or through Postoffice Box 904.

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MINING AND SCIENTIFIC PRESS

An Illustrated Journal of Mining, Popular Science and Progressive Industry.

BY DEWEY & CO.,
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SAN FRANCISCO, SATURDAY, MARCH 22, 1873.

VOLUME XXVI.
Number 12.

Warsop's Aero Steam System.

We present to our readers this week an illustrated description of a system in use in England which claims to protect boilers from scaling and foaming without the use of chemicals. Its efficiency was tested by one of our own citizens, who vouches for its merits. The principle of the system is to utilize the waste heat escaping through the smoke box by forcing compressed air through a coiled tube in the box; which air, thus heated to 600° Fahr., is forced with the water along the bottom of the boiler through a pipe perforated with small holes, at a downward angle of 45°, aiding ebullition. It is stated that by thus mixing air and water no incrustation can be formed, nor will there be any foaming. Although these advantages are conceded, theorists differ in the saving of fuel by aerosteam. The diminished consumption is attributed to diminished incrustation. The saving by use of aerosteam at English mines particularly is reported as very great, and it would probably be equally beneficial in this country.

Warsop's system has been practically tested on an engine on the Lancashire and Yorkshire Railroad, in England, for a year, and the results have satisfied the company so well that it has been applied to numerous other engines. The official reports of the practical working of the system on that road state that it prevents scaling, stops foaming, saves fuel, is cheaply applied to existing engines, and prolongs the lives of boilers, tubes and fire-boxes. It is stated that the engine on which it was tried was fitted out with only half new tubes, the remainder were old and incrustated with over one-eighth of an inch of scale. At the end of seven months' work it was found that the new tubes were clean and bright, and the old tubes were gradually parting from their incrustation. A curious atomic change in this scale was apparent, for it had become honey-combed and friable; portions had lost their adhesion to the tubes, came off in strips and were removed from time to time. The circular of J. L. Sanford, of this city, agent of this patent, whose card will be found in our advertising columns, states that it is found in practice that agitating the water by

the injection of heated air prevents incrustation in the boiler, keeps up a vigorous circulation of the water and maintains a uniform increase of force.

As to foaming the circular says that the engine was not only free from all interruptions of that kind, but the usual foam that floats in the water in the gauge tube was entirely absent. The water was so clear that it required close

The Coal Carrying Steamer "Eastport."

We spoke in a recent issue of a steamer called the "Eastport" having gone on a trip to Coos Bay to bring back coal, and at the same time stated that in case the experiment of bringing coal with steam power instead of sail was successful other similar steamers would be built. In view of this the following facts con-

There are three furnaces flues three inches in diameter direct to back connection, and 3¼ inch return flues.

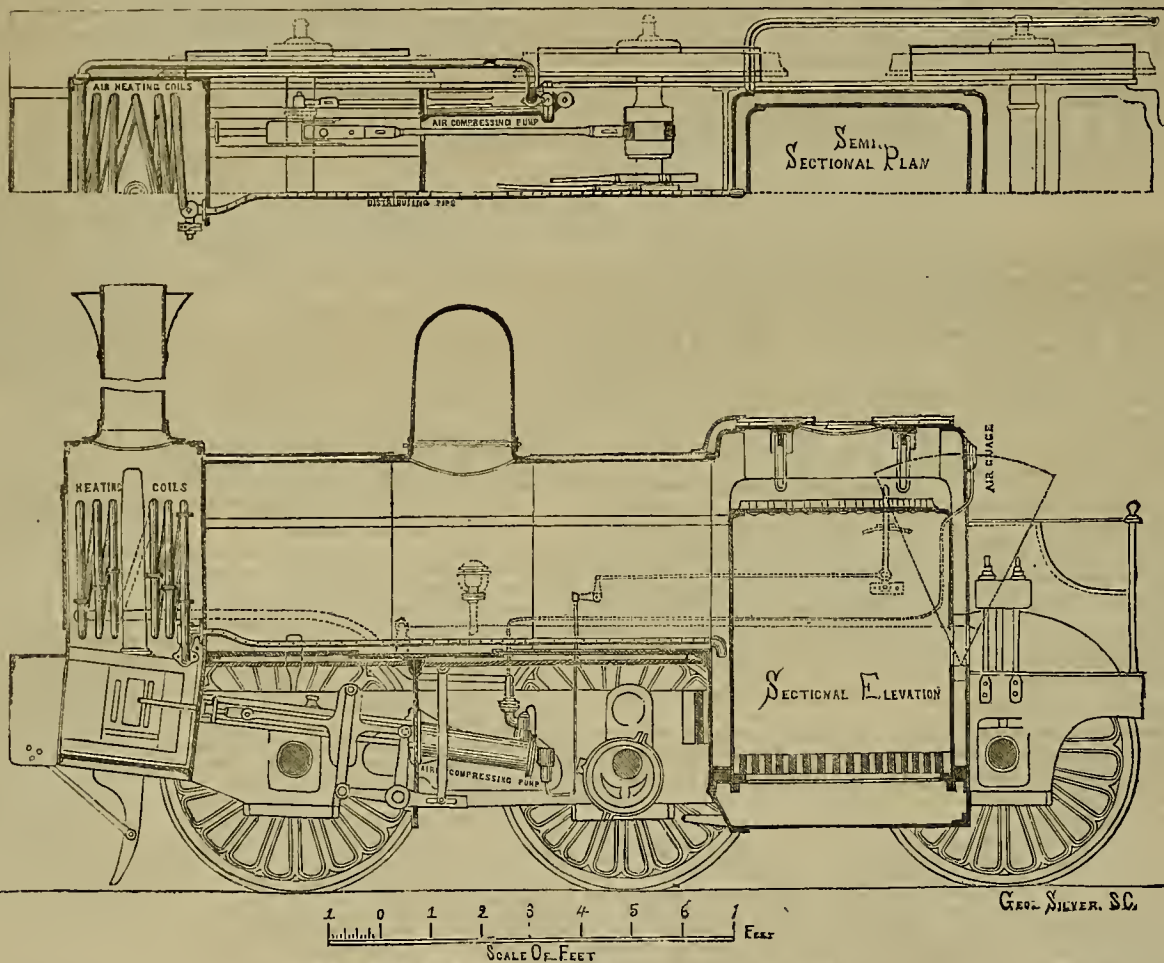
Many engineers expected the boiler to be too small for the size of the engine and that too much heat would escape up the chimney. In proof that this did not take place and that the combustion was complete, the flues were found clean and did not require cleaning at the end of the trip; some wood chavings put into the smoke-box were found to be unconsumed. The evaporation was equal to 9.27 pounds of water to one pound of Coos Bay coal, a higher result than has ever been obtained on this coast in steamboat boilers.

The return trip was made in 48 hours with about the same conditions in the engine room, but with a light wind aft and without help from sails. Consumption of coal 20 tons; distance by log 451 miles. The success attending the trip of this vessel it is expected will induce the owners to place another on the stock and lay the foundation for regular freight by steamers. This will not only be a great convenience for getting coal to this city, but will give employment to many in building other vessels and running them. The "Eastport" is a very neat, handsome little vessel

aside from her utility, and a line of steamers of the same model running from here to Coos Bay would reflect credit not only on her builders, but on our city also.

GOLD IN UTAH.—It is stated that the heavy stratum of rich gold-bearing gravel known to exist in Bingham Cañon, Utah, in the old river channel, will be vigorously worked this season. The drain tunnel of the Young America Company is already eleven hundred feet in length, and will be continued with the aid of proper machinery. It is estimated that over a million and a half in gold has been taken from these mines during the past few years.

Kimball & Co., carriage manufacturers of this city, will send to Vienna a very elegant single-seated buggy, with running gear of plain varnished ash, and laurel-wood box, highly polished. It is made very light and some of those who see it will no doubt think Californians must be very reckless to ride in such a gossamer conveyance. It is, however, very strong and well made.



AERO STEAM SYSTEM APPLIED TO A LOCOMOTIVE.

inspection to see the gauge line. The system has been applied and thoroughly tested in marine engines with the same results.

It requires little argument to prove that if large quantities of waste heat are returned to the boiler through air tubes, there must be a great saving of fuel. From the official report on the working of this experimental engine, with half old and incrustated tubes, it appears that the average saving of fuel during the year from the first crude experiment to the last improvement, has been about 20 per cent. By the use of all clean tubes at this start and an improved air coil, better results are now said to have been attained. Before the system was applied the engine used 52.2 pounds of coal per mile, and now uses only 34.4 per mile.

The system may be cheaply applied to engines already built, the requirements being simply an air pump, a wrought iron tube coiled in the smoke box, a perforated copper pipe in the boiler, with connecting tubes and stop cocks, which additional parts may be seen by reference to the accompanying engravings.

cerning the first trip will be interesting. The "Eastport" left San Francisco on the evening of February 26th, during a severe southeast blow which lasted for 12 hours, raising considerable sea; from which time until Coos Bay was made they had moderate headwinds. Notwithstanding the ship was flying light she behaved well, and made the run—420 miles by patent log—in 58 hours, and consumed 23 tons of Coos Bay coal, developing 350 indicated horse-power, which is equal to 2.5 pounds of coal per horse-power per hour. The coal used was sound Eastport coal, but subsequent trials showed that good screenings could be used instead.

The engine is fully steam jacketed and is furnished with a good surface condenser which condenses the steam and allows the same water to be used over. During the trip up the waste amounted to only nine minutes feed from the sea. The boiler is made of the form most approved by English engineers for compound engines, and is 11.6 in diameter and 12 feet long.

CORRESPONDENCE.

Utilization of Placer Tailings.

[Written for the MINING AND SCIENTIFIC PRESS.]

Wherever the tailings from placer claims are hacked up, the soil thus made is the most productive of any known in the mining section, affording by its looseness the most favorable condition of vegetation and tree growth, no doubt owing in part to its permeability to moisture. But this does not include tailings from heavy hydraulic claims, this being generally clear sand and gravel.

The most valuable and productive garden spot in the mining section is made ground, and thousands of similar places abound whereby a small amount of labor, flats drained of their moisture and rendered barren by some ugly cut sluiced through in the search for gold, can be filled up and made valuable. In favorable locations it would even pay to sluice off from some steep hillside having a rich deep soil, to level these once fertile flats, now drained dry as a bone during our long summers.

In filling up a gulch—as in fact anything connected with improvement of the soil—the best way is the cheapest; construct a dam of two parallel walls of stone from two to four feet apart across the gulch and from bank to bank and fill in with soil well rammed down. However, well this may be done, there is always a strong probability, that when completed and filled, the water would find some place to leak through, and by the head acquired get a hole through, thus washing away the filling, if not undermining the walls themselves.

The best way is to back up the water by building up the dam, if not in too much volume, give the lower wall, considerable slope up stream and use as large a stone as can be handled in laying it, the larger the better, especially at the bottom.

If there is much water in the gulch it may be well to put in a long box, in the lowest place under the dam, and have a gate at both the upper and lower ends. The gate above to shut down and raise the water, to puddle the filling between walls, or to draw off the water in case of breakage; the lower gate shut above when all is finished would fill up with sand, but in any case it would be well that the stone work did not rest upon the box. When finished and up to the necessary level a ditch or by-wash should be dug around one or both ends of the dam, and continued for a sufficient distance below to prevent undermining, and of a capacity to carry off all heavy rains or surplus of water.

As placer mining has been the destruction and ruin of the best portions of the country where carried on, I call the attention of those making homes, to this method of partly repairing the damage, and in the long run will pay better than the ground originally mined out.

I. H. REED.

West Point, Calaveras Co.

The American Fire Detector.

[From our N. Y. Correspondent—ALBERT WILLIAMS, JR.]

This is a most ingenious contrivance for the detection and consequent prevention of destructive fires; for there hardly ever happens a fire which could not be readily extinguished in its inception. The great trouble has ever been that the fire is not discovered till under considerable headway; then it is a matter of great difficulty to control it. In view of this any sure method of finding out the fire and its exact location, instantly meets with a warm welcome. The "Detector," therefore, just fills a niche in our otherwise nearly perfect system of city fire departments; and where there are no engines, its protection is all the more necessary.

The only form of fire detector is that made by the "American Fire Detector Co.," under a patent issued Aug. 29th, 1865, to Mr. Dion of New York. It has been strongly recommended by the Board of Fire Underwriters, and is being adopted in all the large hotels, tenement houses, public buildings, etc., of that city. It is required by law to be placed in all tenement houses not provided with fire-escapes; and, in consequence of its less cost as well as intrinsic superiority, is generally preferred to the escape.

The apparatus is quite simple. The detector and alarm are distinct from each other. To quote the circular of the company:

"The fire detector in size and appearance resembles a small marine clock; the principle upon which the operation of this invention is based is that of the expansion of metals."

By means of a screw operating a hand upon the dial plate, a thermometric spring, composed of two metals, is set to the degree it is desired that an alarm should be sounded. When the temperature reaches that degree, the compound spring is, by the action of the heat, raised sufficiently to set free a weight which trips a lever in its fall, releasing an upper lever to which is attached to the wire connecting the detector with the alarm. When in use, the detectors are attached to the walls near the

ceilings, and the wire is carried thence, like an ordinary bell wire, to the indicator, annunciator or alarm, which is operated by tripping levers, each held suspended by a wire connected with a detector, or a number of detectors, there being one lever for each room or floor wherein the detector or detectors may have been placed."

The delicacy of the compound spring thermometer is something remarkable. It is much more susceptible to sudden change than the ordinary mercury or spirit ones, as it is not enclosed in glass, but perfectly open to the air. It is sometimes used in private houses to notify the hypercritical occupant when his furnace heat gets above the regulation, 68°. But for the actual detection of fires the gauge is usually set in the nineties, to avoid false alarms. If set only two or three degrees above the temperature of the room, the lighting of a match or the animal heat of one or more persons will release the alarm.

Though this invention has been in use but a short time, it has already demonstrated its value; and, without a single failure to alarm, has prevented many fires. Strange to say, the detector is used in hot houses, drying rooms, etc., almost as largely as for its original purpose.

Affairs in Eureka.

A correspondent writes us from Eureka, Lander county, Nevada, as follows:

Four months ago this was a prosperous mining community, our mines and furnaces were all running full blast, the hills resounded with the woodman's ax, on all sides were to be seen evidences of prosperity, which some deemed permanent. While I write, all this is changed, our furnaces are all shut down with one solitary exception—the Wild West, the mines are in the same condition except the K. K., the miners are thronging away to fresh fields of enterprise, and there is hardly a sound to disturb the stillness that broods over the land. You will naturally ask the cause of this sudden change. The causes are various. The Richmond, one of our leading mines, is shut down in consequence of their lawsuit with the Look Out; the Ruby Con. and other mines have stopped work from inability to have their ores hauled, owing to the horse disease, and several prospectors have ceased working their claims on account of the severity of the weather. As regards the Eureka Cons., the big mine of the district, everything is at a standstill. This inactivity I cannot account for. It cannot be in consequence of their suit with the Richmond, for they never took a ton of ore from the disputed ground; their reduction works are in good order, with a sufficiency of coal to last for some months, it is a well known fact among the miners that there is an abundance of ore in their mines, while the roads are as passable for them as for the K. K. Company.

Our correspondent then proceeds to give the details of certain differences between Superintendent Ellsworth and the miners employed in the Eureka Consolidated, which being of a local nature and of no special interest to the general reader, and which, moreover, having already appeared in a paper published in the immediate vicinity of the mine, we have omitted, to make room for matter of more general interest.

Letter from Julian District.

Our correspondent indulges, at the opening of his letter, in some fanciful theories with regard to the formation of the immense "mesas" or table lands of that portion of the State, which are not of general interest, and which he will excuse us for omitting and coming directly to the more practical matters which form the conclusion of his epistle.

This Julian district is notable as being the theater of a new class of development, resting entirely upon the result of labor unaided by capital, and we do not doubt that the mines in this vicinity will yet out yield any quartz gold mining district in the State. The owners are erecting their new steam hoisting works, and while excavating for the foundation laid bare two ledges, one of which works from \$10 to \$25 per ton.

The Golden Chariot has bought the Antelope mill and have their grade nearly complete so that they can move the mill to its new site, in the cañon four miles below the mine. Our prediction as to the turn out of this mine have been verified, and it will undoubtedly be the most immediately remunerative mine ever opened.

The Excelsior, situated about three-quarters of a mile southeast of the Julian, and owned by Dwarakowsky & Hauver, is down 70 feet, and is a "pocket" ledge; some of these nodules turning out hundreds of dollars in value to the shoveler.

The Good Hope, a supposed extension of the original discovery Washington ledge, is about to put on steam hoisting works. The California will resume work in May—this is undoubtedly a continuation of the Owens, and only requires going down upon to develop as well.

Upon the whole the prospects of a most prosperous future is opening for this part of San Diego County; there is but one cloud—the "grant," which hovers vulture-like over many of the best interests of our State.

F. M. SHAW.

San Diego, March 1st, 1873.

Mount Diablo Coal Mines.

We condense the following interesting items concerning the operations at the Mount Diablo Coal Mines, from a correspondence in the Brooklyn Home Journal:

A large amount of coal has been extracted during the past ten years, and the underground workings are now of vast extent, there being at the present time from five to six miles of levels or gangways in working order, independent of those abandoned and now caved. These levels are run across the breaks of the different veins at a distance of some 325 feet apart, from which miners work up through the breasts to the higher levels, cutting out the coal with exception of pillars left for support on either side of the gangways, and inserting timbers behind them as they advance to the upper levels, throwing the coal as sent into shutes about sixteen feet apart, down which the "bunkers" convey it to the

Lower Levels,

Along which it is hauled in rail cars, by mules or horses to the different stopes, up which the cars are hoisted by steam power, and then run off and dumped into the "bunkers" on the surface.

In these "bunkers" the coal is screened by some of the Heathen Chinese before being loaded on the steam cars for shipment, and in these "bunkers" is the only point at which our illustrious pagan brethren are allowed to work, so there are not enough of them paid to support a "Josh" at this point, while their Christian brethren are called on for contributions to send missionaries for their conversion abroad.

There are three different stopes now in use; 150x400 feet in width and 500 feet in length. A number of steam pumps and engines are at work at various points; while coal is obtained from

Six Different Lifts.

So you may imagine the operations are somewhat extended.

The company are now engaged in sinking a new shaft 19x9 feet in the clear, with two compartments for hoisting and one for pumping, said to be the largest and best on the coast, and now down 227 feet, designed to strike the upper vein at a depth of 400 feet; and the lower one at the depth of 800; to be continued to a much greater depth in the future at a depth of 217 feet.

A 12x15 Foot Tunnel

Which is 658 feet long, is being run from the shaft to intersect present workings on both veins.

A month hence two new engines will be purchased at a cost of \$25,000, which with cost of shaft to depth of 400 feet, is estimated at \$200,000, and when completed most of the present hoisting apparatus will be measurably abandoned.

About six years ago the company constructed

A Steam Railroad

Down through the cañon from the mine to New York landing, and the coal is now run from the bunkers into the cars and thence dumped on board of vessels at the landing, the cars running down the whole distance, under brakes, the descent being 767 feet, the heaviest portion of the grade being

300 Feet to the Mile,

The steepest up which locomotives are driven in the United States. Three locomotives are in constant use, principally for hauling up cars, freight and materials for the mine; two passenger cars, daily, being attached.

As I stated before, the present yield is from

3,000 to 10,000 Tons per Month,

And the company are prepared to throw that amount or more on the markets in the future, and our English cousins are hardly likely to prevent it by competition, as their supplies seem to be rapidly exhausting.

It will cost probably \$40,000 to place the new hoisting engines in position. They are on the

First Motion Principle,

A new introduction in this country. The drum revolves with each revolution of engine, taking up forty-two feet of rope, and capable of hoisting and discharging a load of one ton per minute, from a depth of 1,000 feet. The rope will be of English steel wire, tapering, and weighing two tons. The engines are being built at the Pacific Iron Works, San Francisco, under the superintendence of Mr. Frutter, engineer of the mine, and will be of 300 horse-power.

EXPLORATION OF AFRICA.—A dispatch from Berlin gives the following item: A thorough exploration of Africa, from the west to the east coast, has been under contemplation for some time, and it is believed that all preliminary arrangements for the success of the undertaking have been made. The geographical societies of Germany, who have had them under consideration, have adopted a plan by which they propose to complete from the west coast of Africa the discoveries made by Dr. Livingstone from the east coast.

MARSHAL'S SALE OF MINES.—The Monitor and Magnet mines, in Little Cottonwood Cañon, Utah, owned by an incorporated company in this city, were sold on the 12th inst. by the Territorial Marshal, to satisfy an execution for \$11,000. They were purchased by Theodore F. Tracy, agent for Wells, Fargo & Co.

Another New Mining Company Proposed.

We learn that some parties left Grass Valley this morning for San Francisco, the object of the visit being for the purpose of raising a capital of \$15,000 with which to work the Donaho and Ryan quartz claims. These claims are on the northwesterly extension of the Ophir (Empire Co.'s) and the Rich Hill ledges, being 1,000 ft. in length on the Ophir ledge and 800 ft. in length on the Rich Hill ledge. The claims are situated at the head of Woodpecker Ravine and are one mile in a southeasterly direction from Grass Valley. The proposition on which it is hoped that capital can be raised is as follows: A company will be incorporated, the capital stock of which will be divided into 20,000 shares of the par value of \$100 each. Of these shares, 10,000 (one half) will be sold at \$1.50 per share, a total of \$15,000. The present owners of the claims are to retain the other shares. The money thus raised will be used entirely in working the claims, such as erecting machinery, sinking a main shaft, etc. The claims are well situated and have only been worked to a depth of from 35 to 40 feet, and on a length of about 600 feet, which shows the pay chute to be quite a long one. The ore taken from these claims has paid, by mill process, from \$20 to \$75 per ton, never less than the lower figure named. The ledges in the claims are in thickness 20 and 10 inches; the Ophir or Empire being thicker than the Rich Hill. These claims we think, bid fair to equal, if not to excel the Empire mine in its palmy days of the year 1854, and with the improvements of the present day, in the manner of working mines and in the appliances for saving gold, the Donaho and Ryan (Magenta) claims will give the owners handsome dividends.

We regard the plan, briefly detailed above, of raising money with which to pursue the business of mining as a move in the proper direction. Instead of selling, or attempting to sell at large figures, for cash, let the owners of quartz claims retain a certain interest and give the other portion to those who will furnish working capital; the owners receiving no money for the claim until the claims themselves pay dividends. Worthless claims will thus be kept out of the market. Under such a plan there is no chance for deceptions and no inducement for misrepresentation. We hope to see other miners follow this plan, and if so the miners here will find plenty of employment. The good mines of this vicinity are great in number, and the owners of them will do well to take chausse with capitalists in making developments.—Grass Valley Union.

A HOAX.—Our Eastern contemporaries are being misled by an item which is going the rounds of the press, and has now got into the *Iron Age*, to the effect that Dr. Blake, of the San Francisco Academy of Sciences, and Judge Hastings, of the California State Geological Survey, announce the discovery of a current of electricity running north and south at a distance of about 150 miles from the Pacific coast, along a belt of metallic deposits, which serves as a conducting chain between the poles. The truth is that neither Dr. Blake nor Judge Hastings ever announced any such thing, nor has Judge Hastings the slightest connection in any capacity with the California State Geological Survey. Both gentlemen are members of the California Academy of Sciences and we heard one of them at a recent meeting, make some inquiries as to the author of the paragraph mentioned. Some one in this city wrote a letter containing the news (?) to an Eastern paper from which it has been widely copied. It was written in a spirit of fun, and probably, by the same pen that sent the Pavy hoax to the New York *World*, giving the results attained by the Pavy expedition at the Open Polar Sea, when Pavy had never left this city.

NEW COAL MINES.—Last evening it was rumored in the different Club rooms, and on the streets, that a large deposit, or a number of deposits of coal, had been struck in Box-Elder Cañon, about seven miles from here. What the kind or quality of the coal is, we are not informed, and, in fact, it is not known to the discoverers, who are a party of gentlemen residing in Brigham City. A party of gentlemen went down to Salt Lake City with some specimens of the mineral in question this morning, to have it examined, and we hope that although the substance may not prove to be the pure article, it will lead to a rich vein of black diamonds, which will be worth a mint of money to the discoverers as well as to the whole country generally.—*Corinne Reporter*.

DUTY ON IRON FLUES.—A case was on trial on the 12th inst., in the United States Circuit Court, to recover \$580.29, duty paid under protest. On the 25th of March, 1872, William McCrindle imported from Glasgow, Scotland, 925 wrought iron flues, weighing 58,029 pounds, upon which he claims the lawful duty was 2½ cents per pound; but ex-Collector Phelps charged and demanded 3½ cents, which Mr. McCrindle paid under protest. He appealed to the Secretary of the Treasury at Washington, who sustained the decision of the Collector. The difference is \$580.29, to recover which the plaintiff commenced an action in the Circuit Court.

SCIENTIFIC PROGRESS.

Is Heat any Mode of Motion of the Atoms of Ordinary Matter?

Prof. W. A. Norton, furnishes the March number of the *American Journal of Science*, with an elaborate discussion on this interesting query. With regrets that we have not space for the article entire, we append a statement of the points made in objection to the proposition, and the conclusion to which the author arrives. The Professor opens his paper with the following

Query.

Is heat any mode of motion of the atoms of ordinary matter; such atoms being regarded, in accordance with the common notion of an atom, as incapable of experiencing any change of form or dimensions, or in the intensities of their acting forces?

There are three conceivable modes of motion of such atoms—a vibratory or oscillatory motion, and a revolution of one atom around another; or a rotation of each about an axis.

The inquiry has reference only to atoms of ordinary or gross matter. There can be no question that heat, in its origin, and generally in its manifestations, consists in some form of periodic movement, attended with regularly recurring impulses communicated to the ether which fills all space and pervades the interstices of bodies; since waves of radiant heat cannot possibly have any other origin. But the question is, whether the constituent atoms of bodies have this movement, or those of some form of ethereal matter intimately associated with these atoms.

Can Heat be Any Mode of Vibratory, or Oscillatory Motion of the Atoms?

Against this notion of the origin, or nature of heat, many serious objections may be urged. It implies rates of vibration inconceivably more rapid than we have any independent reason to suppose can take place in the interior of bodies.

The most rapid molecular vibratory motion that we know of, occurs when a vibrating body emits a musical sound of the highest pitch that the ear is capable of detecting. This is at the rate of less than 80,000 vibrations per second, but an atom emitting the heat-rays of the red end of the spectrum vibrates at the astonishing rate of 455 millions of million times per second! Thus in the supposed heat motion the vibration is six thousand million times more rapid than in the most acute audible musical sound. It is true the disproportion between the quantities of matter in vibration in the two cases may be very great, but it does not follow that the rate of vibration should augment in the same proportion.

That this astonishing disproportion above stated, between the velocities of vibration of heat-rays and the most acute musical sound, may exist, it is necessary that the same enormous disproportion should subsist between the accelerating forces in operation.

That this may be true, it is also necessary that every substance should be an aggregation of molecules made up of infinitely smaller atoms, and that in every instance the distance between the molecules should be vastly greater than that between their constituent atoms, and that each molecule should consist of millions of atoms. It is hardly necessary to add that there are insuperable objections to this supposition, on both chemical and physical grounds. The author here goes into an elaborate discussion to prove that heat cannot be any mode of vibratory or oscillatory motion of atoms.

Can Heat Consist of the Revolution of Atoms Around Each Other?

The same objections that have been urged against the theory of atomic heat and light vibrations, will hold against this hypothesis, which seems, in fact, to be almost a mechanical impossibility, consistently with the ordinary permanency in the properties of substances.

Can Heat Consist in a Rotation of Atoms about Axes?

The same objections still hold against this hypothesis as against that of atomic vibrations, to which it may be added, that upon this idea the expansive action of heat must result from ethereal vortices originating in the motion of rotation, but if such vortices have an outward or repulsive action, in a direction perpendicular to the axis of rotation, the tendency should be the reverse of this in the direction of the axis; and hence atoms that have taken on, under the impulse of the heat waves, a more rapid rotation should exert an expansive action in certain directions, but a contractile action in directions at right angles to these.

Other objections, might be urged against the doctrine, drawn from both physical and chemical considerations, which, unless they can be effectively answered would seem to require that this doctrine must be unhesitatingly abandoned.

Conclusions.

The results then bring us irresistibly to the conclusion that atoms of bodies must be made up of distinct parts bound together by certain forces; and that heat must consist in some movement of relative displacement among these constituent parts of the atoms. If now we consider that every atom is capable of exerting upon surrounding atoms an effective re-

pulsion at the most minute distances, and an effective attraction at certain greater distances, we are led to infer that the "atom," so-called, consists of a central attractive nucleus, surrounded by an envelope, or atmosphere, composed of repulsive elements. We also readily discern the possibility that heat and light may consist in some mode of motion of this outer envelope, either in its elementary parts, or as a whole.

Now we have independent evidence, afforded by the entire series of electric and magnetic phenomena, that there exists a subtle form of matter, made up of mutually repulsive elements, intimately associated with the atoms of bodies, which has received the name of the electric fluid, or electric ether. It is true that it has been vaguely conjectured that electricity may consist in some mysterious mode of motion of the atoms of ordinary matter, but such a mere conjecture, unsubstantiated by any decisive evidence in its favor, cannot throw an air of improbability over an hypothesis that is sustained by a multitude of actual phenomena.

It is, however, conceivable that the electric may be identical with the luminiferous ether which permeates all bodies, and is known to be physically linked to its atoms. We may then form two possible conceptions of an atom, with its essential accompaniments, viz: (1) that it consists of a true atom surrounded solely by an atmosphere of luminiferous ether; (2) that it has, in addition, an envelope of distinct electric ether immersed in the ethereal atmosphere.

In view of the results of this discussion, we recognize the high probability that heat and light originate in some mode of motion occurring in the ethereal atmospheres, or in the electric envelopes of the atoms; or, more properly, in the force or forces by which such a movement is produced.

Against this conception of the origin and nature of heat, the objections that have been brought forward against the prevailing notion do not hold good. The source of heat is now transferred from the atom proper to its ethereal atmosphere, or electric envelope, one or both—and therefore to a form of matter nearly if not quite as subtle as the medium of light, and whose elastic forces are nearly or quite as intense. Hence the enormous rapidity of the recurring movements, and the amazing intensity of the accelerating forces in play in the evolution of heat and light, are in full accordance with the present hypothesis.

Again, the change in the physical state of the "atom" and consequently in its operative forces, which we have recognized as attendant upon the evolution of heat by impact, are effects that may reasonably be expected from a disturbance of the atomic envelope by the force of impact. Also, upon this hypothesis the impact of the ether of space upon the earth, and other cosmical bodies, should take effect upon the ethereal atmospheres of the atoms of these bodies, and develop electric or ethereal currents, that would eventually pass off in the form of heat-energy, without finally checking the transitory motion of the atoms.

WATER ON THE MOON.—All observations hitherto made tend to prove that water in any form does not exist on the moon's surface. But it has been considered that it was once present there, and indeed traces of aqueous or glacial action are by some considered to be evident. What then has become of the water? Assuming the solid mass of the moon to contract on cooling at the same rate as granite, its refrigeration, though only 180 deg. Fah., would create cellular space equal to nearly 14½ millions of cubic miles, which would be more than sufficient to engulf the whole of the lunar oceans, supposing them to bear the same proportion to the mass of the moon as our own oceans bear to that of the earth. If this be the present condition of the moon, we can scarcely avoid the conclusion that an ocean can only exist on the surface of a planet as long as the latter retains a high internal temperature.

VIBRATING MOTION.—Every one is familiar with the large amount of vibrating motion produced on the earth by a train of cars or a loaded team, when passing very near the observer; but few, however, can realize the fact that the movements of a horse, over pavements, even before the sound can be heard in the stillness of night, will cause serious disturbance to many instruments used by scientists in their observations. Prof. Tyndall describes an instrument which he was lately using in London, so delicate that the indicator would move through a scale of more than a hundred numbers by the mere passing of a cab. "In fact," he remarks "so sensitive is the instrument, that long before the sound of the cab is heard, its approach is heralded by the quivering of the figures on the scale."

STILL ANOTHER ASTEROID.—The discovery of the 129th planet or asteroid was announced some two or three weeks since as having been made by Dr. C. H. F. Peters, on the night of February 5th. And now we learn by an appendix to the March number of the *Journal of Science*, that Dr. Peters has announced still another—the 130th, as having been made by him on the 19th ultimo. It shines as a star of the 11th magnitude. These discoveries were made at the Litchfield Observatory, Clinton, N. Y.

A COMET was seen to traverse the system of Jupiter and his moons, in 1870, without causing the smallest disturbances among the satellites, although the nebulous body of the comet itself was so much disturbed that its entire orbit was changed.

BIELA'S COMET.—This remarkable comet does not seem to have completely lost its identity as a cometary body, as Mr. Poyson, the English Royal Astronomer, announces in *Nature* that he has received advices from Prof. Klinkersruef, stating that he distinctly saw at least one portion of that comet on the night of November 30th last. This vision being interrupted by clouds, he did not see it again until the 3d of December, when it showed "bright, with a decided nucleus, but no tail." The next morning he got a still better view of it, when it still showed a "bright nucleus; a faint but distinct tail." He saw but one comet—in fact, in the few moments available for observation, he had no time to look for the second comet. Thus the speculations with regard to the disruption of this body, and its separation into a cluster of meteorites must remain unsettled until its next appearance, at least—some three years hence. Prof. K. seems to think that the comet actually touched the earth on the 27th of November; as when last observed, the two separate bodies into which the comet is known to have been divided several years ago, being over a million of miles apart and still receding, it may be that one of the divisions only has become disrupted, and taken the form of a cluster of meteors.

MECHANICAL PROGRESS.

Joining Band Saw Blades.

The operation of joining band-saw blades, that at first seems so mysterious to those unused to brazing and soldering, is extremely simple when once learned. A few failures may be expected in the first experiments, and the letters received by the manufacturers of sawing machinery from their customers relating to this matter are sometimes quite humorous, and not unfrequently contain practical suggestions of great value, that have been overlooked in the workshop by the builders.

Brass, spelter, German silver, and various alloys are used for making the joints. The preference being generally in the end given to the silver solder, on account of its convenience and the low heat at which it fuses, compared with brass. Its strength is quite sufficient, although not equal to brass; in fact the joints, however made, rarely give way, the weak points being where the annealed or soft steel meets the tempered, or unannealed portion of the blade; by a little dexterity, however, and after some experience, the temper can be restored at this point, by applying water while the blade is yet hot, a plan that is now commonly practised.

Joining saw blades, however, belongs to the saw maker, and the necessity for doing it in the workshops is owing to the frequency of breaking the blades, which will no doubt be overcome in time.

To make a joint with silver solder or German silver, the solder should be rolled into thin sheets; the saw being scarfed or bevelled off to about one-third of its thickness at the ends, and cleaned with acid; the solder is placed in the joints, the piece being large enough to project on all sides; the joints should then be clasped with a heavy pair of tongs, heated to a full red heat, and held until the solder is well melted and runs out of the joint, when the tongue can either be suddenly cooled with water, or removed, as the case may be. For heavy saws of four inches or wider, there should be provided two pairs of tongs, the heated pair is clasped over the hot pair from the opposite side, and gives the compression needed to close the joint.

The manufacture of band-saw blades requires the most careful and intelligent manipulation, with a great deal of what may be termed special knowledge; so much so, that their manufacture has become quite exclusive things in Paris, where they are nearly all made at this time. The steel for the larger plates and indeed for the greater number of saws, is made now in England, but the tempering and smithing processes remain with the French.

Saw makers sometimes contract with French houses for steel, tempered and ready for toothing and grinding processes that can certainly be as well done, and much cheaper in France; the object being to secure the name of manufacturing band saws. This plan is likely to lead to doubtful results, owing to the great danger of drawing or injuring the temper by those who do not understand the entire process.

Perin Company of Paris, were the first to manufacture these blades that gave profitable results; being also the manufacturers of machines, and indeed for a long time the only manufacturers of such machines. Their experiences in operating the saws combined with great care and perfection in their manufacture, have rendered Perin's blades famous all over the world.—*Richards' Treatise on Wood Working Machines.*

IMPROVED BLAST FURNACE.—The Messrs. Neilson, of Summerlee, Eng., have recently put in operation a blast furnace, which is said to be working much more economically than blast furnaces of ordinary construction. The secret of the operation consists in the increased height of the furnace and the proper distribution of the gas generator. The diameter of the bosh is 16½ feet, the shaft rising 70, instead of 50 feet, the height usually allowed for that diameter of bosh. The furnace gradually elopes to a diameter of 12 feet at the top.

THE PRESERVATION OF EXPOSED SHEET-IRON.—The direction of the government railroads of the Netherlands has published the results of some experiments in regard to the preservation of sheet-iron used in railroad bridges. From 32 sheets half was cleaned by immersion for 24 hours in diluted hydrochloric acid; they were then neutralized with milk of lime, washed with hot water, and while warm dried and rubbed with oil. The other half was only cleaned mechanically by scratching and brushing. Four of each kind were then equally painted with red lead, with two kinds of a red paint of oxides of iron, and with coal tar. The plates were then exposed to the weather, and examined after three years. The result was, 1. That the red lead had kept perfectly on both kinds of plates, so that it was impossible to say if the chemical cleaning was of any use. 2. That one kind of iron oxide red paint gave better results on the chemically treated plate than on the other; in fact, a result equal to that of the plate painted with red lead, while the other kind of iron oxide red gave not very good results on the plates, when only scratched and brushed. 3. That the coal-tar was considerably worse than the paint, and had even entirely disappeared from those iron sheets which had not been treated chemically, but only cleaned by brushing.

TO REMOVE FAT FROM THE WATER OF CONDENSED STEAM.—The steam condensed from engines always contains fat, resulting from the material used for lubricating. Messrs. Cail and Co., in Paris, collect the water of condensation in a common reservoir, and pump it into a receptacle provided with a powerful stirring apparatus, consisting of shovels, Archimedian screw, etc. This receptacle is three-fourths full, the remaining space being filled with petroleum; the apparatus is set in motion for five minutes, the water being allowed to settle fifty-five minutes. Five minutes time is sufficient to separate all the fat which is then contained in the oil, and the purified water can directly be used again. A hundred pounds of petroleum will absorb fifty pounds of fat; it has then a specific gravity of 0.840, but should be renewed when presenting a density of 0.810. It is subsequently regained by distillation.

SILICON STEEL, to which we have several times referred, seems to be steadily making its way into practical use. Its manufacture has been patented in England. The *Journal of Iron and Steel*, in speaking of it, says: "The pig iron from which it is made is melted in a suitable furnace, and when nearly melted, an addition of from 15 to 40 per cent. of its weight of silicious magnetic iron ore, mixed with coke, is made, and well stirred into the metal, after which it is run out into pots and placed at the side of the furnace, holding about half a ton each, in which it is well stirred up with a rabble, previous to being tapped into the moulds. If wrought silicon steel is required, the same process is followed out, with only the difference, that when the steel is in the pot, it is stirred up until it "balls up," or comes to nature, as it is termed. Silicon steel, when of good quality, is stated to contain 0.600 per cent. carbon, along with 0.552 per cent. silicon.

CUTTING TOOLS OF COPPER.—It has been doubted by many that the copper tools of the ancients really possessed the density and cutting power usually ascribed to them. Sir Gardner Willkinson, however, remarks that some of the bronzes daggers found by him in Egyptian tombs were so beautifully tempered that, after having lain buried for 3,000 years, they possessed, when dug up, an elasticity almost equal to that of steel. It is thus definitely proven that the Egyptians really did possess an art, which has been lost, of making bronze of a particularly fine temper, capable of taking and keeping a sharp edge.

PRIZE FOR STEEL.—The Council of the Society of Arts, London, have resolved to offer the gold medal of the society to the manufacturer who shall produce and send to the London International Exhibition for 1873, the best collection of specimens of steel suitable for engineering purposes. The council reserve the right of withholding the premium, in the event that the premiums exhibited are not meritorious.

THE MANUFACTURE OF RAILS by a new system, which does away with manual labor to a great extent, is to be carried on in a rail mill, which is now being erected at Louisville, Ky., at a cost of \$500,000. In the process of making the rail, the iron passes through thirteen sets of rolls, without a halt, and is turned over five times for side rolling. The iron is taken from the heating furnace, and transformed into a rail in half a minute.

A NEW FUEL FOR WARMING CARS.—On some German railways the carriages are heated, without stoves or hot water pipes, by the use of a composite fuel, which emulsifies slowly; being placed in an iron vessel, which is enclosed in a copper box, hermetically sealed. In case of accident all danger of accident is thus obviated. The contrivance will yield a steady supply of heat for twenty-four hours without recharging.

RESISTING OXIDATION.—It is said that Mr. Rhind found in a tomb at Thebes, which had probably not been opened for 2,000 years, iron hoes and nails on the doors of the repositories "as lustrous and as pliant as the day they left the forge." How were they kept from oxidation?

TUOLUMNE COUNTY.

MINING AT ASTRAVILLE.—Tuolumne Independent, March 15: The claims in and around Astraville, above Cherokee, are good. The Wild Cat Co. have their shaft down 90 ft., and tunnel 75 ft. long. The vein is 18 inches to 2 ft. wide and pays \$10 per ton. The Co. have in astraville, and intend to put up a five-stamp mill shortly.

The Easton claim looks well. The rock is rushed by two stamps at present, and ground by an arrastra.

The Uncle Sam and Virginia claim have a shaft down about 100 ft. The rock pays \$60 per ton.

Nevada.

ANTELOPE DISTRICT.

LOCATION.—Eureka Sentinel, March 15: This district is located 2 or 3 miles east from Chinney Station, extending north to Mount Ararat and south to Sulphur Lake, and about 5 miles east and west.

This district divides itself into two zones or belts. The metallic field of one is in a fine granulated silicate of lime the other is in dolomite, or magnesian limestone, containing a variety of lead ore.

A MORTEN VEIN.—One great mother vein divides the district into nearly equal parts; it runs north and south, and dips east.

The Indian Queen.—Upon which an inclined shaft being sunk is a mine of fine plumbago. The gangue contains gold, as well as silver, and assays \$175 in silver and \$35 in gold, or \$210 per ton. Gold can be seen with the naked eye in some of the rock.

AN OLD FORTY-NINER.—Evening Star, Merrihue, Monitor, Kearns, Alabama, Caledonia, and Highland Chief series of mines belong to Donald McMurtry, an old 49er, who has done a great deal to develop the mineral wealth of the country.

CHINA MINES.—The Whelan boys own the General Jackson, Enterprise, and Ophir. These mines look well; assays ranging from \$80 to \$240.

JOHN ROACH is the owner of the Native Silver. This belt is impregnated with chloride of silver; a fine foot vein is in sight. A shaft is being sunk; and from appearances, this is a promising mine. It contains large ore bodies.

THE WAVE, in which a tunnel is being driven to tap the ore body, is 90 ft. deep.

Washington has a shaft 10 ft. down in chloride, assaying from \$85 to \$100. This has the appearance of being large mines.

BELMONT.

BELMONT CO.—Reese River Revue, March 15: After the Canfield incline by contract, having let 100 ft. They are stopping on the water level and are working on the best body of ore ever discovered in the mine. This body is 700 ft. north of the Canfield shaft, already measuring 80 ft. along the drift, showing a face of 5 ft. of ore that will average \$300 per ton.

EL DORADO CON. CO.—This company have commenced stopping on 340 ft. level north; working in an immense body of black sulphurated ore, assays from which run from \$130 to \$1200 per ton, also stopping on 240 ft. level north and south, and raising a chute from 400 ft. level north, 150 ft. from main incline. The ore house and dump are filled up with good ore, which is accumulating on account of the mill being occupied this month on ore from the Arizona mine, which is keeping the mill going from its fine breast of ore on lower tunnel level. The company is shipping at the rate of \$2,000 worth of ore daily.

MONITOR CO.—Keeping their mill running steadily on ore from the Monitor mine. All the upper stopes look well. The lower works are sending out some very fine ore. This company is shipping its regular quota of ore.

EL DORADO NORTH CO. have sunk their vertical shaft 50 ft. and are now timbering the shaft, which is 5 ft. 6 in. After the shaft is timbered up, a level will be run to the ledge 100 ft. below the bottom of the old incline.

ELY DISTRICT.

RICH ORE.—Pioche Record, March 8: We were last evening shown some very rich ore from the Khedive mine. It is the genuine chloride ore, and assays from 1,200 to \$1,500 a ton. It came from a vein-body one ft. wide; but the ledge proper it is claimed, is 20 ft. in width.

RICH DISCOVERIES REPORTED.—March 15: Last Saturday some prospectors came in from the west, bringing remarkably rich specimens of silver ore, which they say they obtained in the southern part of Esmeralda county, near the California line. The ores are chloride, for the most part. The discoverers say the veins are of great extent, some being 25 ft. in width.

HERCULES.—Pioche Record, March 8: There are 1,500 tons of ore on the dump of the Cave, the average assay of which, by careful testing, is \$190.15—\$150.12 silver, 7.55 gold, and \$22.40 lead. And there are also in sight in the mine at least 10,000 tons, which can be extracted, it is estimated, at \$1.50 per ton, neither blasting nor hoisting being required in the extraction.

PIOCHÉ PHOENIX.—The new shaft is down 350 ft. The rock very soft, the contractors making 4 ft. every 24 hours.

SILVER PEAK.—Work of sinking the incline was discontinued yesterday, at a depth of 210 ft. At that point the drift was started to the west through a good ore body, the vein matter is 4 ft. wide, 15 inches of which is good milling ore.

PIOCHÉ.—The usual amount of ore is coming up out of the Pioche and the amount at the dump piles is immense—much of which is high grade.

EXCAVATION.—This mine is turning out more ore than ever before, and it is of unusually high grade. The up assay averages \$150 to the ton. The main shaft is 200 ft. deep, and sinking will continue 10 ft. further, when a new level will be started to strike the ledge. The vein body from which ore is being extracted is about 2 ft. in width, well defined and dipping regularly at about 80 deg. to the southward.

RAYMOND & ELY.—From 75 to 100 teams are now engaged hauling ore to the mills from this great mine. The mine never looked better in all parts than it does today.

HOHN & HUNT.—No ore being extracted at the present, or the reason that the dumps are all full and vast quantities are delivered ahead of the mills.

CROWN POINT EXCAVATION.—The ledge in the bottom of main shaft continues to improve in richness—now down 10 ft. below the 90 ft. station.

GOLD MOUNTAIN.—Cor. Elko Independent, March 15: These mines are situated in the southeastern part of the State, near what is known as Lida Valley.

The ledge varies in width from 1 to 6 ft. except most of the gold lodes which are small and range from 2 to 4 inches. The State Line is the largest and best defined, being 7 ft. in width and cropping out for a distance of 1000 ft. Three shafts have been sunk upon it, showing well defined ledge in each. This ledge yields nothing at gold ore, and the precious metal is distributed very evenly throughout.

Two of the prominent silver leads are the Austin and Independent. The Independent is about 5 ft. wide, used in granite and has a streak of very rich ore, about 1 ft. thick, extending from the surface to the bottom of the works, a distance of 20 ft. Assays from this mine run from \$100 to \$2,000 per ton; the rock as taken out will work \$400 to the ton.

In Lida Valley they have a little 8 stamp mill, with only 4 stamps running. The Lida mines are in limestone, and the ore pays from \$100 to \$800 per ton.

IMPORTANT NEW SILVER DISCOVERY.—Pioche Record, March 14: Some important new discoveries of silver have been made in Long Valley District, about 50 miles

south of Bullionville. We have examined sample ore from one of these new ledges, the Green Monster, which must not be confounded with the Hiko vein of the same name. And it is one of the finest specimens we ever saw. With considerable chloride of silver it carries a small percentage of copper, and all the assaying tests, so far have run up to the hundreds per ton, while the selected rock has reached as high as \$2,700. The ledge is enormous in extent, being from 7 to 10 ft. wide, and it has been clearly traced 2½ miles. A shaft has been sunk 50 ft., and the ore body disclosed at the bottom 16 ft. wide and is remarkably rich. The ore of Long Valley seems to be free milling ore.

HUMBOLDT COUNTY.

SURFACE MINING.—Silver State, March 15: Some miners have commenced ground sluicing for gold in Congress Gulch, and, we understand, are making wages at the business. One specimen worth \$2.50 has been found in the diggings. Should the diggings prove rich, there will be plenty of water in the creek this spring to supply several mines.

MARIETTA.—The ledge in the face of the lower drift is 4 ft. thick, 1 ft. of which is solid ore.

STAR DISTRICT.—The De Soto mine, in Star District, is at present yielding richer ore than ever before. It resembles the antimonial sulphurets of the Shiba. Four or five men are employed in the mine, and it is estimated that the ore extracted daily will average \$100 to each of the miners.

SANTA CLARA DISTRICT.—Work progresses on the Lady Anna mine, and the prospects are encouraging. The character of the ore changes as depth is attained on the ledge from chloride to black sulphurets.

LANDER COUNTY.

GALENA.—Reese River Revue, March 12: The town of Galena is situated in Battle Mountain Mining district, about 16 miles southwest of Battle Mountain Station. The ore taken out in that vicinity is principally copper and argentiferous galena, large quantities of which are shipped every month to Swansea for reduction.

VIRGIN AND LAKE SUPERIOR MINES are situated in Copper Canon, and belonging to the Battle Mountain Mining Company, incorporated in England, ship monthly over 200 tons of high grade copper ore.

ANTIMONY.—The shaft is down 225 ft. at which depth is a 6-ft. ledge of antimony. We understand, however, that the ore pays a fair profit over the expense of mining and transportation.

WHITE AND SHILOH CONSOLIDATED.—This shaft is down 300 ft. at the bottom of which is a ledge 15 ft. in width, containing a vein between 3 or 4 ft. in width of galena and silver ore, carrying a large amount of ruby and wire silver. These mines ship about 100 tons of ore per month. The last shipment averaged \$550 per ton in silver besides the lead.

THRIFTY.—The shaft is down 175 ft. The proprietors are shipping 175 tons per month. At the depth attained the ore vein is nearly 3 ft. wide.

BUENA VISTA AND BATTLE MOUNTAIN.—Situated in Galena Canon. About five tons of fine ore are being taken out daily from the Battle Mountain—about 200 tons from the surface.

WASHOE.

Gold Hill News.—March 15, has the following:

HALE & NORCROSS.—The north, or engine winze, from the 1,500-foot level, made the connection with the main north drift on the 1,700-foot level at three o'clock a. m. last Monday, giving a splendid circulation of pure air and greatly facilitating the work in that portion of the mine. The main north drift is still continued, being 20 feet north of the winze and 180 feet north of the main incline. Four cross-cuts have been commenced on this level, one running directly east from the incline, another 80 feet further to the northward, also running east, and one running east and one west, directly from the engine winze, 160 feet north from the incline. A raise has also been started on the rich vein of ore struck while opening the 1,700-foot station, which opens out about three feet in width of ore, worth \$100 to the ton. The south drift at this station is being pushed ahead with all the vigor possible and nothing new to report. The ore breasts between the 1,300 and 1,400-foot levels are looking and yielding finely as usual. The ore body at the second station is opening out handsomely and promises a valuable development. The daily yield could be considerably increased, but owing to the horse disease it is impossible to get the ore hauled to the mills, so that only 160 tons per day are being extracted—just enough to keep the Bacon and Trench mills running, these mills being connected with the mine by railroad.

GOULD & CURRY.—The supply of water in the bottom of the incline has been steadily increasing for the past two days, impeding the work to such an extent that it is deemed best to stop the sinking until the pump can be lowered to the 1,700-foot station, which is ready to receive it, so that the delay can only be of a temporary nature. A drift north from the main east drift on the 1,500 foot level has been started on the ledge recently developed on this level, in the hope of finding ore further to the northward. The main south drift on the 1,600-foot level, to connect with the south drift from the Savage, is still pushed steadily ahead, with no change of consequence to note. Prospecting on the other levels continue as usual, with no new developments to note.

Letter of the 17th says that since the last report work has been stopped in the bottom of the incline, on account of the water increasing so fast that they could make no headway. The water was so hot they could not work in it, the thermometer showing 138, which is much hotter than heretofore shown on the lead. Will soon have the new pumps down and we will then continue sinking on the incline. On tenth station, east drift, have been running around the broken ground so as to get started to work on the quartz. Have made 26 feet, and expect to get into the quartz in a day or two. Have made 18 feet with the north drift. On eleventh station south have made 16 feet, with no change to report from any quarter.

CONSOLIDATED VIRGINIA.—The main north drift on the 1,167-foot level from the Gould & Curry shaft is making good headway, running on the east line of the ledge, the face of the drift still in ore. A cross-cut west (No. 4), 100 feet north from the last (No. 3), has been started for the ledge, and is in 20 feet, having about 8 feet further to run to reach the ledge.

About 23 tons of ore per day is extracted, which mills from \$33 to \$35 per ton. The shaft is down 247 feet below the 500-foot level, the bottom in good blasting ground, and the sinking progressing at the rate of about 3 feet per day.

By a private dispatch from Virginia we learn the following: "The Consolidated Virginia have cut a fifteen-foot ledge on the line of the White and Murphy and California. Assays run from \$64 to \$105 per ton."

WOODVILLE.—The south drift, third station, is 125 feet, showing a three-foot ledge of good milling ore. This winze from this first station is down 42 feet, the ledge in the bottom showing the entire width of the shaft. Commenced shipping ore to the mill last Sunday, but owing to the prevailing horse disease, was compelled to stop hauling on Monday evening.

YELLOW JACKET.—The main drift east from the incline at this 1,500 foot level is still driven ahead in the vein, with the face in lively quartz, principally. Owing to the great heat the progress is necessarily slower than it would otherwise be. Considerable water is met with, as the strata of the vein are cut through, but it is easily kept out with this pump. At the 1,400-foot level the drift north is continued, with the face in porphyry and quartz, which give low assays. The same may be said of cross-cutting at the north end of the 1,300-foot level. Forty or fifty tons a day of ore from this 1,300-foot level of the Belcher mine are hoisted through the Yellow Jacket shaft for that company.

CHOLLAR-POTOSI.—No ore is being extracted from this mine at present, the ore dumps all being full, and it being impossible to get the ore hauled to the mills. The northwest prospecting drift at the ninth station is still driven energetically ahead, with no change of material interest to note. The heavy flow of water from the face of the northwest drift at the eighth station still continues, keeping the pump steadily running, and greatly impedes the progress of the work.

SIERRA NEVADA.—Daily yield sixty-five tons of ore, keeping this mill steadily running. The ore breasts in the different parts of the mine are not looking quite as well as at our last report, although the value per ton remains unchanged. The use of coal instead of wood at the mill and hoisting works is found to work well, and quite a saving in the matter of expense. Prospecting the 500-foot or lower level still continues, with no important developments to chronicle.

BALTIMORE CONSOLIDATED.—The second station is now in sixteen feet and timbers for that distance. As balance hob for the pump will have to be put in at this point, taking some time, the sinking of the main shaft is being pushed forward as usual. The epizootic does not interfere with the working of this mine, there being plenty of wood and coal on hand and the work energetically pushed forward.

SAVAGE.—The two east cross-cuts, started last week on the 1,600-foot level have not yet made any valuable or important developments. Two other cross-cuts to the westward were commenced on this level during the week, but have not yet disclosed any change in the formation worthy of note. The main south drift on the 1,700-foot level is still pushed ahead with all the vigor possible, and no change to chronicle since our last report. The main north drift on the 1,600-foot level, to connect with the south drift from the Gould & Curry, is making good progress, having only about 170 feet further to run to make the connection.

The weekly report for the week ending on the 15th gives the following summary of operations: Ore extracted from the mine, 284 tons, 1,980 pounds; shipped to the mills, 134 tons, 1,980 pounds; on hand at the mine, 285 tons; average assay value of the ore extracted, \$24.36. The ore extracted came from the second station of the north mines.

SILVER HILL.—The water has been drained and sinking of the shaft resumed, the work making good progress, though some trouble is yet experienced from pockets of water. Work in the main north drift at the first station is resumed, the face of the drift still in excellent ore and making good headway. The main north drift at the second station is being driven energetically ahead, with no change of consequence to note.

CALEDONIA.—Work has been suspended in the main south drift on the 400-foot level, on account of the heavy increase in the flow of water. Cross-cutting and prospecting still continue in the main north drift on the 400-ft. level, with no new developments to note. The main west drift on the 500-foot level is in 60 feet, the rock in the face working well and excellent progress being made altogether.

NEW YORK CONSOLIDATED.—The water has been drained from the shaft and sinking resumed. The rock in the bottom blasts well, and excellent progress is being made. Everything in and about the mine is working well, and the energetic manner in which the work is being conducted by the present management, augurs well for its future prosperity.

BELCHER.—Daily yield 450 tons. Main incline down 76 feet below the 1,200-foot level. The 1,300-foot level still continues opening out finely. The cross-cut east from the main south drift, about 100 feet from the Crown Point line, is in about 50 feet. The last few feet it was not looking quite as promising as was expected, but to-day the face shows decided improvement, being in fine ore. The main ore breast at this level are showing splendid. The other ore producing levels above are also looking and yielding well as usual, and the billion yield for the present month promises to be even

better than that of last month. There is sufficient ore in sight to considerably more than pay for the snail's mine at the present price.

CROWN POINT.—Daily yield 600 tons. The quality of ore taken from the lowest levels shows considerable improvement, running higher in gold. The 1,300 foot level, especially, is turning out very fine ore. At the south line, next to Belcher, the best and richest ore is found. It is being worked six or eight sets of timbers wide, and the whole face is in first quality ore. The north drift has been discontinued. The south drift, at the 1,400-ft. level, and also the incline, is being driven ahead as usual. The mine is, like the Belcher, selling at considerable less than its actual cash value. The receipts for this present month are expected to foot up to fully \$1,000,000 or more.

IMPERIAL.—Work on the new machinery and other surface improvements is making steady progress. During the week the new pump engine was started up, everything working with the most perfect satisfaction. The pumps are being lowered in the shaft, and everything arranged in the best possible working order. Prospecting has been resumed on the lower levels, but as yet there are no rich developments to report.

KENTUCK.—Prospecting this 1,300-foot level still continues with no new developments to report.

OVERMAN.—There is but little change to report in this mine, with the exception of a steady increase in the flow of water from the face of the main west drift on the 1,000-foot level. About thirty-one feet have been added to this drift during the week. The pumping machinery is working splendidly, keeping the supply of water well drained.

SECOON.—This main east drift from the new shaft in the cañon is still driven ahead, with but little change in the quality of ore since our last report. The raise from this level to connect with the old upper works is pushed steadily ahead, this face still in ore. Nothing doing at the new shaft yet.

BUCKEYE.—Owing to the horse disease preventing any further ore hauling at the present time, the mill is stopped, and also all work at the mine, except a prospecting drift or two. The pump is kept going in order to keep the water out, so as to go ahead with the ore production when practicable.

ALAMO.—The main west tunnel is making good progress, the rock in the face working tolerably well. Sinking the shaft is making good headway, the quality of the ore gradually improving as greater depth is obtained, and the body widening out until it now fills the entire size of the shaft.

KICKERROCKER.—The water tapped last week has been drained and the main west drift repaired to within a few feet of the drift. As soon as the repairs are complete work will be resumed in the drift, with fair prospects of speedy and valuable developments.

SENATOR.—After starting up last week it was found necessary to make some repairs to one of the compartments to the shaft, which is being done with as much expedition as possible. As soon as the repairs are completed, sinking the shaft will be resumed.

ARIZONA AND UTAH.—The new machinery is nearly ready to start, and everything in and about the works will soon be in splendid working condition, so that the development of the mine can be prosecuted with all the vigor possible.

OCCIDENTAL.—A cross-cut west from the main north drift is in 22 feet in ledge matter, but has not as yet disclosed any ore. The main drift is still continued to the northward, with no new development to note.

MINT.—The shaft is down 112 feet. The contractors completed their work this morning, and it is the intention to immediately start a drift eastward to cut and prospect the ledge.

JULIA.—Good progress has been made during the past week in the east drift 800-foot level, and west drift 1,000-foot level. The water does not interfere with the work in either drift.

PICTOR.—Cross-cut 16 feet in rather low grade ore. Ore in incline shows improvement as sunk upon. Work will start in lower tunnel in a few days.

SUTRO TUNNEL.—Total length 3,700 feet. Work is discontinued in all the shafts, but the tunnel heading is being pushed ahead as usual.

JACOB LITTLE.—Work in upper mine and lower tunnel progressing as usual, with no new developments to report.

LEO.—Incline sinking as usual, with good progress. Some very good ore is coming from the vein.

GLOBE.—The two cross-cuts started fifty-five feet up the raise from the main tunnel are both still in good ore.

Montana.

GOLD CANON—RICH STRIKE.—Deer Lodge Independent, March 8: Jones & James have struck it rich on No. 5 above discovery. Their shaft is 33 ft. deep, and they have 14 ft. of rich, auriferous gravel, and prospects as high as \$1 to the pan have been obtained at 10 ft. above the bed-rock. They are preparing for systematic work next summer, and expect to realize from \$200 to \$300 to the set of timbers. About 30 claims have been located in the district, but only six have been opened, owing to the great depth of the ground.

MINERS are leaving Pioche for Wallapai District, Arizona, from which place recent rich discoveries are reported.

SALT LAKE BULLION.—The Salt Lake shipments from March 9th to 15th were three hundred thousand pounds of ore and one hundred and eighty thousand pounds of bullion.

The Fairfield Mine.

The new mill owned by C. G. Hneey, Baxter & Co., at Fairfield, Camp Floyd, is now in successful operation. It was first started up two weeks ago and already about thirty tons of ore from the Queen of the West, at Lewiston, have been treated, yielding an average of about \$200 per ton, at the clean up. The hullion is nine hundred and ninety-five fine, which is an extraordinary degree of fineness.

The system adopted is dry crushing by the Dodge Crusher and Pulverizing by the Attrition mill. From thence the pulp is taken to the Dodge pans, then amalgamated and flowed through the Dodge settlers, which collect all the quicksilver that may possibly pass off in the pulp from the pans. The process works to perfection—the results averaging about ninety per cent. of assay value. About ten tons of ore can be readily worked a day, and the engine power is abundant for double the amount of work. The mill is running entirely on the ore from the Queen of the West mine, which gives free milling ore, owned by a Detroit joint stock company. The mine has a thousand tons of ore on the dump, and about twenty tons a day can readily be extracted, so that the mill will run for any length of time. Altogether the mill and mine are turning out splendidly and will help the district immensely.—*Utah Mining Journal.*

Bullion Product of 1871.

Advance sheets of the Report of the U. S. Mining Commissioner for the year 1871 has been placed in our hands. The report will probably be issued in a few weeks. Among other things of interest to us here are the figures of the bullion product, which we will produce for the sake of comparing them with those furnished by Mr. Valentine, of Wells, Fargo & Co.'s Express, from which they differ materially. The latter statement, which is carefully prepared at each of the companies' offices, showing the amount shipped monthly during the year, was as follows:

State or Territory.	Silver Bullion or Amalgam.	Gold Bullion or Amalgam.
Arizona.....	\$ 163,739 93	\$ 163,739 93
British Columbia.....	1,349,580 83	1,349,580 83
Colorado.....	\$ 441,235 82	2,605,681 60
California.....	231,870 84	16,167,484 05
Idaho.....	936,934 37	1,471,087 21
Kansas.....	29,417 00	4,031,602 00
Montana.....	22,477,045 75	4,031,602 00
Nevada.....	1,693,602 15	1,693,602 15
Oregon.....	130,175 31	221,262 14
Utah.....	320,107 09	320,107 09
Washington.....		
Wyoming.....		
Total.....	\$24,246,659 59	\$28,024,026 90

Mr. Valentine submitted the following as an approximately correct statement and estimate combined of the total yield of the precious metals for the States and Territories of the United States west of the Missouri river (except New Mexico):

Arizona shipments.....	\$ 163,739 93
Estimate like amount forwarded by other routes and conveyances.....	163,739 93
British Columbia shipments.....	1,349,580 83
Estimate 20 per cent. by other conveyances.....	3,046,917 32
Colorado—excessive if any variation.....	16,399,354 89
California.....	3,279,870 77
Idaho.....	2,408,001 53
Estimate 20 per cent. by other conveyances.....	481,600 31
Montana.....	4,030,929 00
Estimate 20 per cent. by other conveyances.....	819,153 80
Nevada, full.....	22,477,045 75
Oregon, full.....	1,693,602 15
Utah.....	327,437 95
Estimate ore and pig metal by weight.....	1,000,000 00
Washington, full.....	320,107 09
Total yield for 1871.....	\$58,284,029 66

The Mining Commissioner makes an estimate of the product which exceeds that of Wells, Fargo & Co. by \$8,378,971, a somewhat surprising difference. He thinks that Mr. Valentine's addition of twenty per cent. for under valuations and private shipments may be sufficient for California, but is far too little for Idaho and Montana. Mr. Valentine, however, said in his report that he was confident that the allowance of twenty per cent. was a liberal concession, and that the total product did not exceed \$58,284,029.66. Mr. Raymond, (the Mining Commissioner) does not understand why Mr. Valentine made no such allowance for Colorado, but left the impression by saying, "excessive if any variation," that the Colorado shipments were overvalued, and that the amount upon which express charges were paid exceed the total amount produced. The commissioner on the chapter on Colorado in his report gave the sum of \$4,663,000 as the total production of 1871, while Mr. Valentine only makes it \$3,046,917.32. Mr. Raymond says that the reason for this discrepancy is that Mr. Valentine entirely ignored \$923,000 shipped in mats, \$500,000 in ores and \$100,000 need by manufacturers. As Wells, Fargo & Co. gave no details this may be the case.

The Commissioner also considers the state-

ment with regard to Utah as imperfect, and thinks the estimate of the shipment of ores and base bullion at \$1,000,000 is a mere guess. He says the shipments of ore from Salt Lake City, in 1871, amounted to 10,806 tons, averaging at least \$150 per ton in silver, and the shipments of base bullion amounted to 2,378 tons, averaging \$175 per ton. According to this estimate it gives \$1,620,900 as the value of the ores, and \$316,150 as the value of the base bullion, to which Mr. Raymond thinks should be added \$500,000 for the lead contained in ores and bars. This makes Mr. Raymond's estimate of the bullion product of Utah, for 1871, about \$2,800,000, while Mr. Valentine's is only \$1,357,437.

The Commissioner thinks that the figures given in the table above for Arizona are too small, but cannot say precisely how much too small they are. His estimate of the gold and silver production of the United States for the year 1871, is as follows, compared with former years:

STATE OR TERRITORY.	1869.	1870.	1871.
Arizona.....	\$ 1,000,000	\$ 800,000	\$ 800,000
California.....	22,500,000	25,000,000	20,000,000
Colorado.....	7,000,000	3,075,000	4,663,000
Idaho.....	9,000,000	9,100,000	8,950,000
Montana.....	14,000,000	16,000,000	22,500,000
New Mexico.....	500,000	600,000	500,000
Oregon & Washon.....	3,000,000	3,000,000	2,500,000
Wyoming.....		100,000	100,000
Utah.....		1,500,000	2,300,000
Other sources.....	150,000	525,000	250,000
Total.....	\$61,500,000	\$66,000,000	\$66,663,000

—Including Wyoming. †Including Utah.

It will be noticed that the British Columbia shipments of \$1,349,580.83 are omitted from the Commissioner's table, and that Wells, Fargo & Co. omit the New Mexico product of

By comparing the figures given by the Commissioner, it will be seen that Arizona has fallen off in the yield since 1869 by \$200,000; California is \$5,000,000 behind 1870 and \$2,500,000 behind 1869; Colorado shows an increase of \$988,000 over 1870; Idaho has decreased her product \$1,000,000 since 1870 and \$2,000,000 since 1869; Montana falls short \$1,050,000 from 1870 and \$95,000 from 1869. The Nevada product, which was \$14,000,000 in 1869, \$16,000,000 in 1870 and \$22,500,000 in the year 1872, shows an increase over 1869 of \$8,500,000, and of \$6,500,000 over 1870. The New Mexican product remains the same. Oregon and Washington combined show a decrease of \$500,000 from both former years; Wyoming is the same as in 1870; Utah shows an increase of \$1,000,000. The "other sources" decrease \$275,000 from 1870, and \$250,000 in 1869, when Utah was included in the estimate.

It is evident from these figures that the placer mining districts have fallen off, while the quartz mining districts show a decided increase. The Commissioner says that the California mines have suffered from lack of water, and the reduced product is not to be taken as a measure of actual decline in these classes of mining.

The total increase in the bullion production of the United States, according to the Commissioner's tables,—which must be taken as authority on account of his official position,—amounts to only \$663,000 over 1870, but is \$5,163,000 over 1869. While it has materially fallen off in certain localities, it has materially increased in others—namely, Nevada and Utah. The nature of the increase shows clearly that the decline of production from superficial mining is more than compensated by a steady augmentation from deeper sources.

Fish Culture.

Nearly every known animal, large or small, has its own peculiar parasites or lice that prey



PARASITES WHICH ATTACK LARGE TROUT.

\$500,000, and the Wyoming product of \$100,000, as calculated by the Commissioner. To the "other sources" in the Commissioners' table he says he adds \$200,000 to cover the product of the Southern States, and the extraction of silver from lead ores not otherwise taken into calculation. He excludes, he says, from the statement, the product of the Wyandotte smelting works, Michigan, which is believed to amount to \$800,000, because the ores reduced there are obtained from Silver Islet, on the north coast of Lake Superior and outside of the United States.

Let us now see in detail where the difference lies between the Mining Commissioner's statistics and those of Wells, Fargo & Co., in which there is so great a discrepancy. The following table will show this plainly:

Com'r's Totals.	W.F. & Co.'s.	Difference.
Arizona.....	800,000	327,479.96
British Columbia.....	1,619,496.99	472,521
California.....	20,000,000	19,679,225.66
Colorado.....	4,663,000	3,046,917.32
Idaho.....	5,000,000	2,859,601.59
Montana.....	8,050,000	4,873,114.80
Nevada.....	23,500,000	22,477,045.75
Nebaska.....		22,955
Oregon & Washon.....	2,500,000	2,013,709.24
Utah.....	2,300,000	1,357,437.95
Wyoming.....	100,000	486,291
N.W. Mexico.....	500,000	424,663
Other sources.....	250,000	
Total.....	\$66,663,000	\$58,284,029.66

This table shows an apparent difference of \$9,148,474, but it really amounts to \$8,378,471, since Wells, Fargo & Co. took into account the product of British Columbia, which the Commissioner did not, as it is out of the United States; the Commissioner also has the sum of \$350,000 credited to Wyoming, New Mexico and "other sources," which Wells, Fargo & Co. do not give. The Commissioner does not separate the product of Oregon and Washington, as Wells, Fargo & Co. do, so their product is combined in the table.

The Two Great Mines of the Comstock.

The ore bodies of the Crown Point and Belcher mines, says the Virginia Enterprise, are without doubt the richest and most extensive ever developed in the mining experience of the world. The extent of the deposit—for it may be regarded as a single body—is of course unknown, but it has been estimated from assay and measurement that ore to the value of \$30,000,000 is now in sight in the two mines. The lowest estimate is \$20,000,000, and the highest \$40,000,000. These are enormous figures when we consider that the two mines are less than 1,700 feet in length; yet we find nothing extravagant in the highest estimate when we note the fact that over \$9,000,000 in gold and silver were taken from the two mines in 1872. Following is a comparative statement of the yield of the Comstock mines in 1871 and 1872. In 1871 the mines yielded as follows:

	Tons.	Value.
Belcher.....	18,747	\$1,198,920
Crown Point.....	59,949	1,370,884
Chollar-Potosi.....	68,635	2,233,383
Empire.....	8,701	123,616
Hale & Norcross.....	64,123	947,701
Savage.....	49,745	1,045,487
Sierra Nevada.....	18,294	147,117
Kentuck.....	9,183	140,069

Total.....287,377 \$7,804,093

Following is the yield for 1872, with the average value per ton of the product of the last quarter of the year:

	Tons.	Value.	Average.
Belcher.....	83,194	\$4,794,669	\$56 00
Crown Point.....	110,762	4,696,849	31 79
Chollar-Potosi.....	44,860	752,019	15 07
Empire.....	11,243	177,377	15 10
Hale & Norcross.....	38,064	617,325	17 64
Savage.....	63,083	811,867	14 03
Sierra Nevada.....	13,880	122,677	7 39
Woodville.....	660	10,604	16 16
Kentuck.....	11,183	141,847	8 90
Challenge.....	380	1,125	4 88
Total.....	371,349	\$12,028,152	

The average value of all the ore raised from the Comstock mine in 1871 was \$27, and in 1872 it was \$32; while the whole number of tons mined in 1872 was 83,972 in excess of 1871. These figures show that the ore bodies not only increase in volume, but in richness as well as in depth attained upon them, and give the Comstock mines the promise of a golden future. At present the Crown Point and Belcher are producing about three-fourths of all the bullion taken from the many mines of the Comstock; but prospecting is being vigorously prosecuted in the Ophir, Virginia Consolidated, Gould & Curry, Savage, Hale & Norcross, Chollar-Potosi, Imperial, Yellow Jacket, and many other mines of standing in the market, and important developments may be looked for before the close of the year. The most of these mines are still yielding more or less ore, as may be seen from the statements above given; but they are being steadily penetrated to greater depths in search of deposits in a measure corresponding with the vast ore bodies of the Crown Point and Belcher, and the faith is general with miners of experience that such deposits will in the end be found at many points between the Sierra Nevada and Overman.

Winnemucca Mines.

We gather the following items from the letter of a correspondent of the *Alta*: "Situated about half a mile from the railroad line is the thriving little city of New Winnemucca, containing about eight hundred inhabitants, not including a few scores of strolling Pioneers, and the usual complement of terrestrial Celestials. Immediately on the line of the railroad is the original, or 'Old Winnemucca,' upon whose outskirts the newly settled city is fast encroaching, and in a few years will grow into one incorporate body.

The City of Winnemucca

Is named from the river which commemorates the name of that old chieftain, whose glory as a warrior has long since departed, and whose once noble and brave warriors are now homeless wanderers throughout the barren valleys and mountain ranges, where, but a few years ago, he roamed in his wild and native majesty, fearing naught save the temporary influences of the advancing wave of civilization, which ever drives him westward toward the setting sun.

Mines and Mining.

There are sixteen mills in the county, only five of which are running, none using over ten stamps, and work ore by wet crushing, using principally the Stetefeldt and reverberatory furnaces. Within the last two years these mines have produced nearly \$1,000,000 worth of ore. Copper, lead, borax, salt, soda, etc., are also found in large quantities. In the

Battle Mountain District.

One of the most productive in the county, pure antimony is found in very large quantities. This ore is seldom found in a metallic state, and more seldom in its purity. It is a useful mineral, not only beneficial as an alloy in the reduction of other metals, but useful to the sciences and arts, to the medical profession, and was also used, it is said, in ancient times, by the ladies as a coloring to their eyes and cheeks. The word is derived from *anti-moachos*, or anti-monks—several having been poisoned by its indiscriminate use, at its early discovery; which, according to tradition, was in the latter part of the fifteenth century, by a German monk in the Prussian province of Saxony. These mines are said to be very numerous in the island of Bornoe, Sweden and the Hartz mountains, in France. A large vein has also been discovered in the Tulare valley, in Tulare county, and is said to be very productive."

Copper ore in large quantities and of extreme richness is said to have been discovered about 50 miles from Hamilton, in White Pine county.

GOOD HEALTH.

RESTLESS DISCONTENT.—Doctors are often called to prescribe for anomalous complaints whose leading characteristics are furred tongue, want of appetite, disturbed sleep, constipation, feeling heavy in the morning, moroseness, stuffy temper, restlessness and general unhappiness. This state provokes excessive consumption of tobacco and spirits in men; and in women, crossness to children and servants, and a dislike to seeing company.

These symptoms follow persistent abuses of the system. The remedy lies not in medicine, but in reformation. Let the patient ask himself about his eating, drinking, smoking, and other indulgencies. Let him consider, one by one, every drain upon his system. Then let him try a little less loading of the stomach, less strong chicory coffee, less tobacco, less drainage of every kind upon his nervous system. So sure as daylight follows darkness, there will become renovation of health and spirits without medicine.

There would come a great change in social life if we had moral doctors in the land. The excesses that poison our tempers, absorb us with frivolities and make trouble in social life, would be kept in bounds if every one had some fixed moral object to divert the mind from physical excesses, and from chronic ill-humor, which they always engender and transmit to offspring.

MANAGEMENT OF THE TEETH.—Tartar is an earthy deposit, which is made up of the solid constituents of the saliva, and accumulates around the necks and crowns of the teeth. The result of the deposit of tartar about the teeth is to cause the gums to be irritated, and then loosened from the teeth. When much tartar has collected about the teeth, it should be skillfully removed by a dentist, and only by a dentist, who will probably recommend some preparation of his own selection, to restore tone to the gums. The following is a good lotion, to be freely used after the removal of tartar, to strengthen the gums: Tannin, one scruple; brandy, half an ounce; camphor mixture, four ounces. To be used as a mouth wash, night and morning. In those in whom there is a disposition to the formation of tartar about the teeth it is only necessary for preventing its accumulation, to be very careful to cleanse the teeth thoroughly once a day, better still, twice, with a tooth-powder that is somewhat gritty; all the better is it if the gritty particles are soluble in water. The simple powders composed of chalk or cuttle-fish may be with advantage employed.

YELLOW SPECTACLES.—The use of yellow spectacles instead of green or blue is proposed by a recent writer, on the hypothesis that yellow is the ray having the least actinic or photographic power. This error has originated in a want of knowledge of the fact that, of all the rays, yellow has the most powerful action on carbon compounds. Since the eye in its construction involves the use of such compounds, it follows that the yellow ray of all others will have the strongest action on the eye. This agrees with our actual experience; for the yellow is by far the most powerful light to the eye, and the universal preference for green and blue glasses is owing to the fact that these, by shutting out the rays that act with the greatest energy on the carbon compounds of the retina, produce a milder and less irritating action on the organ when by disease or other cause its sensitiveness is increased.

PHYSIOLOGICAL EFFECTS OF COLD.—Recent investigations show that the effect of intense cold upon the human system is the result of changes which take place in the blood, consequent upon a very slight decrease of the general temperature. It has been found that not only a very slight elevation of the general temperature, if being continued produces changes in the blood, which must inevitably prove fatal, but that when the temperature of the blood is lowered only a degree or so below its normal state, equally fatal changes are produced, although of a different character. The blood seems to be in both instances devitalized, becomes incapable of rejecting its carbonic acid, and thus poison is carried through the system, producing the same narcotic effects that the inhalation of carbonic acid produces. These investigations have shown the fallacy of the belief that any animated being can survive after being wholly frozen.

COLD FEET.—Never go to bed with cold feet without applying a hot brick, hot bag of sand, a jug of hot water, or some warming material. Cold feet are often caused by tight shoes, stockings or garters. When the feet are habitually cold, a smart walk or run before retiring, will often make them comfortable for the night.

A POISONOUS PLANT.—A few years ago there was in the Royal Botanical Gardens at Kew, a specimen of probably the most poisonous plant ever introduced into England. It was the *Jatropha urens*, the properties of which arose so noxious that its possession is positively dangerous.

The ex-creator of the gardens was one day reaching over it, when its fine, bristling stings touched his wrist. The first sensation which he felt was a numbness and swelling of the lips; the action of the poison was on the heart, circulation was stopped, and he soon fell, unconscious; the last thing he remembered being cries of "run for the doctor." Either the doctor was skillful, or the dose of poison injected not quite, though nearly, enough to cause death; but afterwards the young gardener, in whose house the plant was placed, got it thrust into a corner, and would not come within arm's length of it. He watered the offender with a pot having an extremely long spout. In a short time, however, the plant disappeared altogether, and another specimen of the genus *Jatropha*, which was afterwards introduced, vanished in the like mysterious manner. It was presumed that the attendants were secretly determined that such plants should not be retained in the houses, to cause the possibility of an accident such as that which happened to their curator. *The Garden.*

EMOTIONAL EXCITEMENT MORE WASTING THAN INTELLECTUAL LABOR.—Serious and calm intellectual work is only very slowly destructive to the nervous health, while emotion, unless directed into proper channels, is highly destructive to the nervous system. The conventional ideas as to the propriety and utility of certain kinds of emotional excitement do visibly bear, in the experience of medical men, the very worst fruit possible. It is true that the emotion of repentance for real guilt is not a thing to be shunned; but the habit of self-torturing introspection, which the clergy are especially earnest in recommending as a means of spiritual purification, is so far from promoting the existence of a really high and pure standard of ethics, that it ruins both body and soul, in the majority of cases, wherever it is applied on a large scale. More especially the habit of inducing unnecessary emotional excitement in young persons who are just entering the dangerous period of commencing sexual life is so morally and physically injurious to a large number of individuals, that it may well be questioned whether those individuals might not have been more safely left in total neglect and ignorance.—*Popular Science Monthly.*

THE INEVITABLES OF MORAL LIFE.—Diseases of the kidneys, liver and brain, for which physicians formerly bled and purged with great hopes of success, we now regard as cases of disorganization, which afford no ground of hope. Nor in the utmost improvement of our therapeutics can we ever expect to find a cure for all the morbid conditions which may be revealed by pathology. A boundary has been set to the operations of the human body. Its machinery must wear out and run down. Age obstructs and deranges its organization. The days of our lives have been limited to three score years and ten, and though by reason of uncommon vigor they may be occasionally extended beyond four score years, still, from the very nature of the frame, it must at last experience decay; and alchemy there is none, by which it can recover its healthful action.

CAUSE OF SCURVY.—M. Leven, being in charge of one of the hospitals of Paris during the siege, made a study of scurvy, and concludes that it is not produced by a want of vegetables, nor are vegetables indispensable for its cure, but that it is the result of bad hygienic conditions in those who contract it. Cold, dampness, excessive work, moral depression and insufficient alimentation, he thinks are the principal causes of scurvy. He believes it to be a fatty degeneration of muscular system, beginning in the heart, and those muscles which are most active, when the degeneration appears in the liver, kidneys and their organs. A great number of cures were obtained by the use of raw meat without vegetables.

MENTAL VIGOR IN OLD AGE.—It is related of Arnauld, the Jansenist, that he wished his friend Nicole to assist him in a new work. Nicole replied: "We are now old; is it not time to rest?" "Rest," exclaimed Arnauld, "have we not all eternity to rest in?" Dr. Samuel Miller says: "There is no doubt that the premature dotage of many distinguished men has arisen from their ceasing, in advanced life, to exert their faculties, under the impression that they were too old to engage in any new enterprise of industry."

BOYS USING TOBACCO.—A strong and sensible writer says a good sharp thing, and a true one too, for boys who use tobacco: "It has utterly spoiled and utterly ruined thousands of boys. It tends to the softening and weakening of the bones, and it greatly injures the brain, the spinal marrow, and the whole nervous fluid. A boy who smokes early and frequently, or in any way uses large quantities of tobacco, is never known to make a man of much energy, and generally lacks muscular and physical as well as mental power. We would particularly warn boys who want to be anything in the world to abstain tobacco as a most baneful poison."—*Exchange.*

USEFUL INFORMATION.

INTERESTING DISCOVERY.—CAN THE CRAWFISH REPRODUCE EYES?—A curious discovery has just been made by a savant here, writes the Paris correspondent of the *Pall Mall Gazette*, though there is some doubt as to the benefit which either humanity or the crustaceous fish operated upon will derive from it. Mr. Chantry has long been engaged in studying the natural history and physiology of the crawfish, and from a paper just read out before the Academy of Sciences, it seems that this careful observer has found out that when young crawfish are deprived of their eyes, new ones will grow in the interval between the shedding of two shells, and this is a perfectly normal fashion. But when adults are operated upon, the regeneration of the eye is slower and more irregular; and not only is the organ generally deformed, but two eyes often take the place of one.

HOW TO CLEAN PAINT.—A chemical journal gives the following advice: Use but little water at a time; keep it warm and clean by changing often. A flannel cloth is better than cotton. Be careful of soap. Put but a little soap or skim-milk in the water; add soap to the cloth when needed. A sharp piece of soft wood is indispensable for the corners, the point will become like a paint brush. A saucer of sifted ashes, used where the paint is badly smoked or fly-specks are thick, is better than soap; wipe last with clean wet towel, and don't spill a drop of water. Never put soap on glass unless it can be well rinsed, which can never be the case with windows; wash off dirt in clean warm water and dry; then, with a paste of whiting and water, and with a cloth, place a little in the center of each pane. With another cloth rinse over the glass; next rub off with a dry cloth till the window shines like crystal.

SEPARATION OF BRASS AND IRON TURNINGS.—The following item is from the *Berlin Industrie Blatter*. We do not know their source of information, but from the character of the publication, suppose it to be trustworthy. "In order to separate such filings it has been customary to draw a magnet by hand through the mass, thus taking out the iron and steel while leaving the brass. Recently a very suitable machine appeared for saving this tedious hand labor, invented by a French Engineer named Bavin, in the machine works of Cail & Co., Paris. Now, however, Mr. Webb employed in the splendid works of the London and Northwestern Railway, at Crewe, had reached the desired end by a very simple and economical process of smelting.

The mixed iron and brass turnings and brass slag are mixed with limestone, coal-dust, and oxide of iron or iron scales, and smelted; the brass settles through the fluid slag to the bottom and is run off into ingot mold."

SEASONING WOOD.—A writer in an English journal informs us that a small piece non-resinous wood can be seasoned perfectly by boiling four or five hours, the process taking the sap out of the wood, which shrinks nearly one-tenth in the operation. The same writer states that trees felled in full leaf in June or July, and allowed to lie until every leaf has fallen, will then be nearly dry, as the leaves will not drop off themselves until they have drawn up and exhausted nearly all the sap of the tree. The time required is from a month to six weeks, according to the dryness or wetness of the weather. The floor of a mill laid with poplar so treated and cut up, and put in place in less than a month after the leaves fell, has never shown the slightest shrinkage.

LOSS OF HEAT IN COOKING, ETC.—It has been computed that, in common domestic fires, seven-eighths and even more of the heat capable of being evolved from the coal pass up the chimney unutilized, so far as mere warming is concerned. About half of the heat generated by the fire is supposed to be carried off with the smoke, about one-fourth in the constant current of the warmed air of the room into the chimney between the mantel-piece and the fire, and the remainder of the loss of heat is represented by the unburned particles of carbonaceous matter in the smoke.

WHOLESALE BURNING OF GAS.—One of the gasometers of Manchester, England, was recently discovered to have a large burning jet issuing therefrom. All efforts to extinguish the flame were ineffectual, until the entire contents of the gasometer 600,000 feet of gas, were consumed. Many residents in the immediate vicinity made hasty removals, fearing an explosion, but none occurred. Nothing is known as to the cause of the opening by which the gas escaped or the origin of the fire. The occurrence was one of a very singular nature.

A SUMMER BOOT.—The bottoming of the boot for summer should be of medium thickness, but if any, rather thicker than thinner, so that the surface of the sole of the foot may be thoroughly protected from the ground and stones. The disadvantage of a thin sole is that it produces callosities at the bottom of the foot, at the parts corresponding to the bones where they are formed.

THE STORM SIGNAL SYSTEM has been reduced to such a nice point in England, that when the storm ball is run up at Greenwich, it is telegraphed to every part in the kingdom. Any vessel that leaves the port after the ball is up forfeits its insurance.

DOMESTIC ECONOMY

Baked Beans.

White beans may be considered one of the substantial dishes. When properly cooked, they are wholesome to a stomach of normal strength, if the taker be accustomed to active exercise. They are not so good for the sedentary, but the greatest difficulty in digesting them results from the fat usually cooked into them. They may not relish quite so well without this at first, but proper cooking will help greatly, for they are much richer if cooked in but one water and that not drained off. The very water that is called strong, and thrown away when the beans are half done, would, if cooked make a toothsome soup. Let it remain, having the beans nearly full of the liquid, and salt just before serving. They should cook gently but thoroughly, being kept covered, so as not to lose the flavor. The time required depends much on the age and variety of the beans. Some will cook in an hour and a half, while others will require three hours. They are best very tender, beginning to fall to pieces, but not so soft as to become thick and pasty with the necessary handling. Some prefer them thick; but in that case they seem to require some trimming—while, if more moist, they become a trimming to other dishes, especially to the potatoes eaten with them. Indeed, it makes a very palatable dish to cook the potatoes with the beans, being careful to serve them as soon as the potatoes are done. A more stylish dish in appearance, but no more palatable, is made by placing the beans, when nearly done, in a nappy (in which they can be served,) covering, the surface neatly with potatoes pared and halved, and baking until the latter are done. Some like a squeeze or two of lemon over them on the plate, and to most tastes they serve well with rather acid fruits, like cranberries or sour baked apples, or with cold or warm slaw, while sweet potatoes and rye-and-Indian bread form an agreeable contrast.

Bean soup is a dish that many people, and especially children, would relish if properly made. It requires about half a pint of cooked beans for a quart of soup. Mash and boil until well diffused in the water, and then run through a colander to take out the skins. Thicken with about one gill of wheat meal, and add a sprig of thyme if desired. Boil five minutes and salt to the taste.—*Science of Health.*

Warm Plates for the Table.

Warm plates are most satisfactory adjuncts to the breakfast and dinner table, for without them all articles of food will cool rapidly; and during this last cold snap a cold plate would have quickly transformed sausage, steak, fried potatoes and buckwheat cakes into decidedly "cold victuals," and frequently the difference between a good dinner and a poor one depends upon a warm or a cold plate. And in no case are they so useful as when mutton is served, for its fat melts only at a high temperature, and quickly becomes congealed upon a cold plate, making it very repulsive excepting to a Greenland or Esquimaux.

Now, it is a very easy matter to warm the plates, if a little attention is paid to them, and when the breakfast table is laid the night previously, the plates can be placed in the tin oven at the back of the stove, or on the oven connected with the range—or if neither of these places are come-at-able, they can be put inside of the stove oven, as that is an article which every house is supposed to possess. After they have become warm enough, they should be put into a cooler place, but not so cool that they will lose too much heat.

The furnishing stores offer very handsome plate-warmers, made of Japanned ware, and also racks of galvanized iron wire, which can be placed upon the stove, or over a hot air register. When plates require to be warmed in haste, they can be dipped into boiling water, and then wiped off.—*Country Guest.*

Economical Cookery.

In all departments of housekeeping it costs less to be neat, orderly and systematic, and to know just how much butter, sugar, eggs and flour to use on baking day, as well as just how long to boil or roast a piece, tender piece of meat, that it may not be toughened, and its sweetness and nourishment cooked away.

Goodhousekeeping is a science, and a science, of which an unpracticed hand is entirely ignorant. Experienced cooks make delicious and inexpensive dishes of odds and ends left over from meal to meal, which in most housekeepers are more or less wasted. Who would believe that the well picked bones of a roasted chicken, with two or three little beef bones taken from the roasted beefsteak which has served at breakfast, boiled two hours in about a quart of water, will make excellent soup good for the sick and tempting to the most delicate taste? Try it and see.

Soup is strengthening, and can be made much cheaper than most people imagine. Beef bones are just as good for soup after they have been roasted as any, and save much expense.

There is no accomplishment for which a woman has so much reason to congratulate herself and be proud, as for being a good housekeeper, and the foundation of housekeeping is to be a good cook.—*American Farmer.*

MINING SCIENTIFIC PRESS

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San Francisco:

Saturday Morning, March 22, 1873.

Legal Tender Rates.—S. F., Thurs., Mar. 20.—buying 87½; selling 88.

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SAN JOSE RAILROAD.—The *Call* has information that Thomas A. Scott will shortly assume control of the San José Railroad. That paper says that it is now supposed that the purpose of Scott is to construct the Texas and Pacific Railroad so as to enter California near the thirty-fifth parallel, with the main lines coming to San Francisco via the Coast route, and that a branch line will extend to San Diego.

VIENNA EXPOSITION.—A dispatch from New York states that notwithstanding the difficulties thrown in the way of Commissioner Thomas B. Van Buren, owing to the European Patent laws, and by Congress in limiting the appropriation to a small sum, the United States is certain of making a creditable show at the Vienna World's Fair, that opens May 12th.

THE WHITE PINE people are talking about establishing a bank of their own, the branch of the Bank of California having been closed. The place is beginning to show signs of more activity and several of the mills will resume operations shortly.

PHOENIX.—According to the *Eureka Sentinel*, the Phoenix Silver Mining Company offers to its creditors forty cents on the dollar, or notes at six months, otherwise the company will go into bankruptcy.

DOO TRAINS are being used in transporting provisions from Alta City, Little Cottonwood, Utah, to the neighboring mines.

THE CALIFORNIA BORAX COMPANY, whose mine is located seven miles north of Lower Lake, on Big Borax Lake, resumed work last week.

THE HORSE DISEASE is hindering operations at the Owens river mines. It has made its appearance at Amazon also.

Appliances and Methods of Roasting Ores.

The recent lecture by Eugene N. Riotté before the Polytechnic class on the subject of roasting was a very interesting one and we regret we cannot give it in full. A synopsis will, however, amply repay perusal. The lecturer commenced by saying that this process of roasting was the fundamental process by which ores and metallurgical products are prepared for beneficiation and of course the latter can not give the desired results if the roasting has not been properly performed. Roasting in the mildest sense of the term means to effect a chemical change by the application of heat without smelting.

Oxidizing Roasting.

If the ores to be heated contain combinations of sulphur, antimony and arsenic and we intend to oxidize these metals and obtain them either as oxides or in part as sulphates, we call this oxidizing roasting. Such, for instance, is the case in the roasting of gold-bearing pyrites of iron, preparatory to the extraction of gold by Plattner's process, with chlorine gas. Here we want the iron completely changed to peroxide, so the presence of a sulphuret or sulphate would be injurious to the result of the chlorination process. As an example, when we want a part of the metals left as a sulphate, Mr. Riotté mentioned the roasting of silver-bearing copper matte in Mansfield. The matte is subjected to careful oxidizing roasting, and the metals are left as oxides, except the silver and a small part of the copper which, at the end of the operation are in the form of sulphates and subsequently leached in hot water. This process is executed with such exactness that only about one per cent. of the silver is lost.

Reducing Roasting.

Sometimes it is desirable to reduce certain metallic salts, namely: Sulphates, antimonates and arsenates, which have been formed during oxidizing roasting, and change them as much as possible into oxides. This is done by mixing finely pulverized coal with the charge by which the sulphuric acid is reduced to sulphurous acid and the arsenates to metallic arsenic, which is volatilized. This we call reducing roasting. This method is used, for instance, in roasting copper ores containing arsenic and antimony in order to remove these impurities.

Chloridizing Roasting.

If it is necessary, on account of the following modes of extraction, to change certain metals into chlorides by roasting with the addition of salt, we have a chloridizing roasting; an instance is the roasting of silver ores for amalgamation or lavification.

Volatilizing Roasting.

In some cases it is necessary to drive off certain substances, as hydrates water, sulphuric acid or carbonic acid, quicksilver, etc., which we speak of as volatilizing roasting. This is done, for instance, where carbonates of iron are prepared for reduction in a blast furnace by roasting in shaft furnaces.

Heap and Kiln Roasting.

The oldest and simplest mode of roasting is roasting in heaps. Here sulphuret ore or matte is piled in pieces on a bed of fuel which ignites the sulphurets. Of course this method can only be used where a partial roasting is required. This is very often the case when sulphuret ore or matte is prepared for smelting and the object in view is to collect certain metals (mainly copper) in a matte, and dissolve others, as iron, as oxides in the slag, or to concentrate the matte.

In many metallurgical works it is found advantageous to manufacture sulphuric acid from the sulphurous acid which is formed in roasting. In this case the ore is roasted in kilns, from which the acid fumes are conducted to the lead chambers. From this kiln there is only one step to the

Hearth and Shaft Furnaces.

Roasting in these furnaces is effected in two ways. Either the ore and fuel are charged in layers or the furnace is heated by fire-places. The process is more complicated where pulverized ores are to be treated, and exact results have to be obtained as to certain chemical changes, upon which the operation depends. The hearth roasting furnaces were, until recently, the only ones in use, with their innumerable modifications. The heating of the charge is either effected directly by the flames from the fire-place, (reverberatory furnace) or it is effected by heating the hearth and arch from the outside (muffle furnaces).

The latter form is used when the gaseous and volatile products of roasting are to be utilized, as in the instance of roasting sulphurets for the manufacture of sulphuric acid. Another instance of the use of the muffle furnace is in the roasting of arsenical pyrites to obtain arsenious acid. Sometimes the muffle and reverberatory furnaces are combined and the bottom of the muffle forms the arch of the reverberatory furnace.

Roasting on Hearth Furnaces.

From the construction of furnaces it follows that roasting requires time, labor and skill. In order to roast a considerable amount of ore in a reverberatory furnace the charge must be spread several inches high; consequently it takes not only time to bring it to a roasting point, but considerable stirring is necessary to bring the particles to the surface. Another disadvantage in this construction of this furnace is that the ore near the first bridge is exposed to a higher heat than that near the flue. In order to insure uniform roasting it is necessary to shift the charge several times. Great care and judgment is required in regulating the heat. If the heat is too high in the beginning the ore even melts and forms lumps which are difficult to destroy, and are imperfectly roasted at the end of the operation.

Parker's Furnace.

The first attempt to do away with the manual labor of stirring was made about 20 years ago by Parker, in England, who constructed a circular reverberatory furnace with horizontal iron stirrers, fastened to a vertical revolving shaft. These furnaces, however, have not been generally introduced for the reason that the machinery not only gets out of order, but the roasting itself is not so perfect as desired.

Gerstenhofer's Furnace.

It was left to Gerstenhofer about seven years ago to invent a roasting furnace, the construction of which was based on an entirely new principle. In Freiberg, the smelting works received quantities of concentrated sulphurets of iron, small amounts of silver and copper more or less finely pulverized. There being difficulties in this way of roasting these in either kiln or muffle furnaces to make sulphuric acid, Gerstenhofer devised a furnace for treating them in which is based on the principle of free fall, and which was soon introduced in the principal metallurgical works in England and on the Continent. It was, however, soon found to be available only within narrow limits. The roasted ore stuck on the terraces, fell down in layers and obstructed the furnace. This is also the case when roasting with salt is attempted. It was also found that when complete desulphurization was essential the furnace was not satisfactory, for reasons not difficult to discover. To accomplish a perfect roasting, the roasted ore must be exposed at the end of the process to a high heat. To do this by adding fire-places to the furnace was found impracticable. The conditions therefore, under which the Gerstenhofer furnace can be used are as follows: First, the substances to be roasted must carry sufficient sulphur to generate a roasting heat; second, the roasted ore must have no tendency to "sinter;" third, it must not be required that the charge should be perfectly desulphurized. This furnace is mainly used to roast pyrites of iron and copper ore and matte, in making sulphuric acid when perfect roasting is not required.

As the subject of cheap roasting is an important one in our mining regions, it is no wonder that innumerable mechanical roasting furnaces have been brought before the public. Leaving out all those which are based upon entirely theoretical ideas and have never accomplished any practical results, we may classify all efforts in this direction under two heads, viz: cylinder and shaft furnaces. Of the former it is only

Bruckner's Furnace

Which has accomplished good results and is of practical value. This furnace is not continuous working. All ores which have a tendency to "sinter" must be excluded from the furnace; in other cases I can recommend it heartily for works of small capacity, all other furnaces which are continuous working give unsatisfactory results where complete desulphurization or a thorough chlorination is required. The ore passes through the cylinder too quickly, is not sufficiently exposed to oxidizing influences and in most cases is discharged in layers containing imperfectly roasted ore inside. Of the shaft furnaces we must mention the

Whelpley & Storer and Keith Furnaces.

Those who understand the principles of roasting will understand at once by seeing this furnace that the construction is based upon a false principle. The ore enters the furnace where it is hottest and drops where it is coldest. For good roasting it is essential that the temperature at the beginning should be low and at the end high. In this furnace the ore remains too short a time the fall being accelerated by the downward direction of the draft. The Keith furnace is liable to the same objection. This latter furnace was introduced about nine years ago in Colorado for roasting gold-bearing sulphurets.

The Stetefeldt Furnace.

While residing in Austin the chloridizing-roasting of silver ore attracted Stetefeldt's special attention and he became convinced that the old reverberatory furnaces would be superseded by a cheaper and more perfect mode of roasting; he found by a few experiments that silver ores could be chloridized with the best results if a mixture of ore and salt were allowed

to drop through a shaft, heated by fire-places near the bottom, against the rising current of hot gases. Here all the conditions for a good roasting are given. The ore enters the shaft where the heat is lowest, which heat increases as the ore falls. The gases formed by the roasting, sulphurous acid, hydrochloric acid, chlorine and volatile chlorides, surround every particle of the ore and materially effect its desulphurization and chlorination. This upward motion of the draft prevents the ore from falling too fast. At the same time the heat is utilized better than in any other furnace. As the draft in the shaft is very strong the finest portions of the ore do not drop down the shaft but escapes unroasted in the rising gases through the flues. To roast the dust a fire-place is constructed in connection with the flue. The speaker here described the Stetefeldt furnaces and spoke of its general use.

A number of other furnaces for chloridizing-roasting which have been brought before the public are but mere modifications of the Gerstenhofer, Whelpley & Storer or the Stetefeldt.

The lecturer closed by considering the chemical changes which took place in chloridizing-roasting, those cases where ores have to be roasted before amalgamating, and stated that although he had been asked to deliver a lecture on metallurgy and local adaptation of roasting and smelting furnaces, he had come to the conclusion that it was impossible to concentrate so much matter into one lecture, without treating the subject superficially.

Worked Out Mineral Lands.

An important decision to both the mineral and agricultural interests has just been made by the Secretary of the Interior in relation to mineral lands. On the 13th inst. the Secretary of the Interior decided the case of Iohabod Dickinson against John Harrington, involving the title to lands in Calaveras county, California. Secretary Delano reversed the decision of Commissioners Drummond, and decided that although the lands had been heretofore used for mining purposes, they are now worked out, and no longer mineral, but must be considered agricultural lands.

In view of this decision the remarks of our correspondent on another page, in this issue, on the "Utilization of Placer Tailings," are particularly applicable. He says the soil made by the tailings from these placer grounds is very productive, except in cases of large hydraulic claims. His suggestions, with regard to utilizing the ground, are well worth attention. Placer miners now who abandon their ground must be careful to take necessary precautions, if their absence is only temporary, that the ground is not taken up as agricultural. This decision will bring to an end the carping of a certain class who inveigh against the country being cut up by surface mining operations. In many instances the ground is benefited for the purposes of agriculturists, as the large flats can be utilized, and, in fact, the soil is really better than it was in the first instance, being deep and rather porous.

In this connection it may be stated that the tailings from quartz mills, if in situations where the land can be periodically flooded may be utilized in the culture of the cranberry. The silicious soil thus formed is admirably adapted for this purpose, and as the quartz tailings are nothing more than pure sand, the cranberry can be grown upon it to advantage. Thus we see that, as well as furnishing the money for the "sinews of war" as well as peace, the miner in his work prepares a place for the farmer to glean his profit, making the ground yield up its treasures in both instances. Some of our mill men might take a hint from this, and where the mill is near a river, and circumstances are favorable, they can follow the vocation of both miner and farmer to advantage. In fact we are sure that in some particular cases, where the mill managers are in the interest of rings rather than stockholders, that the stockholders might make more money out of an acre of tailings, planted with cranberries, than they could out of a \$100,000 quartz mill with a \$1,000,000 mine.

Work at the Bellingham Bay coal mines is progressing favorably. There are at the present time over 3,000 tons of coal in the chutes ready for shipment.

QUICKSILVER has been found about two miles from Calistoga, Napa county, on the farm of J. Schram.

COAL has been discovered on the line of the Union Pacific Railroad, within 20 miles of Ogden.

CANON CITY, a mining camp in Grant County, Oregon, claims to ship \$300,000 in gold yearly.

Repulsion as a Cosmic Force.

The nature and action of repulsion, as a cosmic force, does not seem to have heretofore received that consideration which appears to be due to the numerous and important phenomena connected with it. Such philosophers as Bosovich, Robert Hooke, Bessel and even Sir Isaac Newton have, indeed, referred in terms more or less unmistakable, to their suspicions that "molecular repulsion"—a force the knowledge of the existence of which is as old as the most ancient Greek philosophy—exerted a wide and important influence in the cosmical economy of the universe, approaching in its universality to the force of gravitation. But it is only quite recently that the theory of its existence as a cosmic force has been carefully discussed at any considerable length.

Dr. Charles Winslow, of Philadelphia (we believe), has had the boldness to enter this field of enquiry, and call attention to certain facts and phenomena of great importance as bearing direct and (as he thinks) unequivocal testimony to the existence of this force, as a counterpart to gravitation. The Doctor carefully traces it into its broadest expansions, applications and connections with other forces and all forms of matter. He holds that repulsion is a general and cosmic force, cognate in origin, equal in value, quantity and extent with the force of gravitation, going hand in hand, inseparably with gravitation, into atoms and masses throughout space, even into the dynamics of celestial motion; and that it plays an equal part with attraction, as a primary agent in the production of all physical, organic and vital phenomena.

He holds that molecules are endowed with two positive and inseparable forces—attraction and repulsion. That a principle of duality or antithesis exists between these two forces, similar to that which exists between positive and negative electricity. The Doctor has recently published an elaborate work upon the subject, forming a volume of some 500 pages.

The progress of knowledge upon abstract subjects has always been slow. It is true we have positive knowledge of much; but how infinitely much more remains to be learned! Dr. W., in the introduction to his book, very truthfully remarks that every close thinker has often perceived that with the advancement of experimental discovery and solid knowledge, physical theories grow perplexing on account of the insufficient development of fundamental principles. That investigators in many fields of research feel oppressively hemmed in by some inexplicable deficiency of means to final inductive analysis. We are now, more than ever before, living in an investigating age; and although in positive science nothing can be assumed, still the path of solid progress can seldom be successfully trod without the frequent assumption of hypothesis, as a means to that end.

The Doctor is quite modest in his assumptions, and like an earnest investigator is free to acknowledge that he considers his work as one only just commenced, and that his theory will not be accepted as science without much further and more careful consideration. His aim, thus far, has simply been to set forth the subject in its broadest aspects, so as to invite to its consideration the attention of the learned, hoping that those who come after him may make more solid the ground and more sure the steps where he has reached only uncertain results or failed altogether.

In this connection we would call attention to an article on page 179 of this issue, in reference to the kind of motion involved in the phenomena of heat. Do we not need something more than is usually understood by "molecular repulsion" to substantiate the doctrine that heat is a mode of motion?

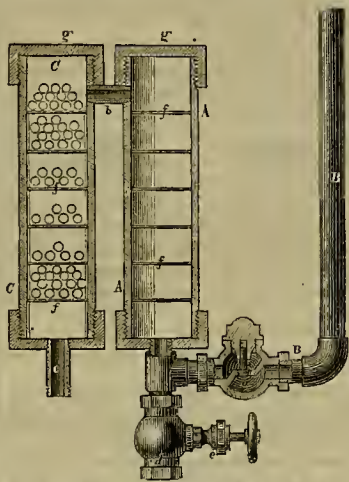
NITRO-GLYCERINE.—We notice that the Supreme Mining Bureau in Breslau, Prussia, has issued regulations concerning the use of blasting materials containing nitro-glycerine, in which the use of pure nitro-glycerine is strictly forbidden. Only mine owners or their commissaries are allowed to purchase dynamite or other nitro-glycerine preparations, and then only in the form of cartridges, and of dealers commissioned by the government. It must be kept at the mines at least 150 meters from the nearest tramways or shafts. Instructions are given about transportation, and trestling the frozen cartridges. The caps must not be kept near the cartridges and all vessels which have contained any of the nitro-glycerine preparations must be immediately burned in an open fire.

Tunbridge's Amalgamator.

For some time past we have seen a paragraph going the rounds of the press, to the effect that one John Tunbridge, of Newark, New Jersey, had recently invented a process for amalgamation which was particularly simple and cheap. It seemed rather strange that any one in that State should invent a process which is applicable only to mining localities, but supposed, of course, that it would eventually find its way to this Coast, which it has done, and Wiester & Co., No. 17 New Montgomery street, have the patent right for sale. We have obtained from them a drawing from which the accompanying cut was made.

The engraving represents a vertical section of the apparatus. *A*, and *C*, are two vessels connected by a pipe *b*, and provided with screens *f*, *f*, at different altitudes. *B*, is the ore or pulp pipe, and *a*, its check valve connecting with a vertical discharge pipe *d*, having a cock *e*. The vessel *A*, is filled as far as the pipe *b*, or nearly so, with quicksilver, while balls of copper amalgam, or copper balls coated with quicksilver are placed upon sieves in the chamber *C*.

The mode of operation is as follows: Power is employed in connection with the pipe *B*, to force the ore washings through the pipe, the valve *a*, opening inward and yielding to any force exerted through said pipe. The washings then pass up through the quicksilver in the chamber or vessel *A*, and are subdivided in passing through the screens *f*, *f*; they are then



AMALGAMATING APPARATUS.

forced through the tube *b*, into the other chamber *C*, pass down among the amalgam balls and screens and are discharged through the pipe *c*. The effect produced on the pulp is to abstract the principal part of the metal in Chamber *A*, and the greater part of the residue while passing through the amalgam balls in the chamber *C*.

The machine, which was put up in the East, had, as the cut shows, two receptacles, eight inches in diameter by two feet high. The perforated disks placed across the chambers were made of copper. One foot of mercury was poured into the chamber. In this bottom is an inch and a half iron tube, fifteen feet long. The "process" consists in letting on the steam containing the pulp or fine gravel at the top of this tube. Although the patentee claims the use of power to effect his object, the pulp or gravel, by its own hydraulic pressure and without any other power passes up through this foot of mercury, and passes off through the pipe *b*, into the other receptacle *C*, where it comes in contact with the copper balls on the disks *f*, and thence through the discharge pipe *c*. The perforated disks placed at short intervals across the chambers cause the sand or pulp to break up finely, and present, at some portion of its passage, every particle of the precious metals to the action of the quicksilver.

This system can of course only be practical or useful with free gold, but possesses an advantage in bringing every particle of gold in direct contact with the quicksilver. Fine float gold would be caught in this case unless in such a chemical or greasy condition that it would not amalgamate at all. Perhaps a large machine of this patent could be made to work well with tailings in favorable positions, as the process is continuous and the quicksilver would only have to be removed in case of a clean-up. The inventor thinks it is especially applicable in placer mining. Where it could be placed properly it might be used to advantage at a mill, where the tailings could be passed through

these chambers after having gone through the pans, settlers, etc. If there was any saving at all it would count up, since the apparatus is extremely simple and is automatic, requiring little attention. If any one of our readers make any experiments with this device we hope they will inform us of its practical working for the benefit of the mining public.

The Inventor of the Plympton Skate.

The subject of the accompanying cut, Jas. L. Plympton, is one whose name is well-known to all lovers of roller-skating, as the man through whose inventive genius that amusement has been brought to the position it occupies. Mr. Plympton was born in Medfield, Mass., in 1828. He developed a mechanical turn of mind at a very early age, and at 16 years commenced work in a machine-shop at Walpole in his native State. A few years afterwards he was appointed foreman in a large shop in Claremont, N. H., at which time he first became interested in patents and patent law. When 21 years old he associated himself with his brother in machine building in Westfield, Mass., and the firm of H. R. and J. L. Plympton, now well known as designers, manufac-



JAMES L. PLYMPTON.

turers and dealers in furniture, etc., was formed.

Their success in Westfield was very rapid, because both brothers enjoyed good faculties in business enterprise, and built up an enduring reputation for fair dealing with all—from the lowest workmen in their shop to the heaviest tradesmen with whom they had to do. Our personal business relations with Mr. Plympton at Westfield are among our pleasant recollections. Afterwards the firm moved to New York and are now carrying on a large trade, in the above-named business, with a branch establishment in Boston.

Having improved his health from a season of ice-skating at Central Park in 1862, it was his desire to continue the exercise. Artificial ice having proven a failure and no roller-skate being made upon which the curved movements of ice-skating could be performed, he turned his attention to inventing one and soon produced a roller skate, which could be guided by the natural inclination of the wearer. The *Plympton Skate Roll*, a lively little monthly published at Woodward's Gardens in this city, (the head centre of skating on the Coast) and devoted to the interests of the skating community, from which we gain this information, says that from this simple instrument, he has reared one of the most popular and beneficial systems of exercise extant, and of which it has been justly said "As Howe's sewing machine is to our industrial wants, or Morse's telegraph to commercial pursuits," so Plympton's system of exercise is to the social and physical wants of society.

Having completed the necessary mechanical appliances, he formed a company in 1863 called the New York Roller Skating Company, which is still flourishing under the supervision of its founder. He has succeeded in amassing a considerable fortune from this invention. Mr. Plympton is an unusually ingenious man and has peculiar ways of his own. As an instance of this may be cited the fact that his marriage ceremony was performed on an express train going 30 miles an hour, probably the first one to do that sort of thing. As a more constant interest in roller skating is kept up in California than elsewhere, it is hoped that this gentle-

man will yet pay us a visit, and receive as he certainly would, a warm welcome from the admirers of modest geniuses generally, and enthusiastic skaters in particular.

PATENTS & INVENTIONS.

Telegraphic List of U. S. Patents Issued to Pacific Coast Inventors.

(REPORTER OFFICIALLY FOR THE MINING AND SCIENTIFIC PRESS, DEWEY & CO., PUBLISHERS AND U. S. AND FOREIGN PATENT AGENTS.)

By Special Dispatch, Dated Washington, D. C. March 18th, 1873.

FOR WEEK ENDING MARCH 4th, 1873.

SOLLETRINO TOOL.—Lewis Cutting, S. F., Cal. MERICATED TOWEL.—Lydia Stewart, S. F., Cal.

*The patents are not ready for delivery by the Patent Office until some 14 days after the date of issue. NOTE.—Copies of U. S. and Foreign Patents furnished by DEWEY & CO., in the shortest time possible (by telegraph or otherwise) at the lowest rates. All patent business for Pacific coast inventors transacted with greater security and in much less time than by any other agency.

Academy of Sciences.

The California Academy held its regular meeting last Monday evening. A large number of new members were elected, probably one of the beneficial results of the recent donation to the Academy, by James Lick. They were as follows:

Life Members.—Mark L. McDonald, Coll Dean, H. L. Hill, E. J. de Sta Marina, F. E. Wilke, F. Locan, Louis Sloss, R. H. McDonald, James T. Boyd, W. B. Hooper. *Resident Members.*—Lawrence Kilgour, J. D. Howell, J. W. Roper, A. W. Von Schmidt, Michael Deering, Jacob Best, W. A. Aldrich, A. B. Forbes, J. H. Haley, J. H. Blumenburg, R. B. Irwin, S. D. Field, J. N. Smith, O. P. Evans, J. A. W. Lundberg, General J. F. Miller, J. C. Woods. *Corresponding Members.*—M. Lindeman, Otto Finsch, Alexander Willard.

The egg of an Australian Emu was presented by Mr. Fischer. A Gros, druggist, presented specimen of worm drawn from the pipes of the Spring Valley Water Company. Dr. Kellogg presented and read a description of the following new shrubs and plants: A new native of the oleacea or olive family. *Henchero Californica*, a new species of alum root, collected by Dr. Kellogg and S. Brannan, Jr., at San Gregorio Creek, May, 1870. *Lagophylla minima*, or little hare's foot, a mycopoid composite, with the aspect of a dwarf life, everlasting, collected by S. Brannan, Jr., at Oakville, Napa county. *Trifolium pauciflorum*, a dwarf species of clover from Cisco, Sierra Nevada Mountains, found at an altitude of 6,000 feet. *Solidago elongata*, the small flowered golden rod found on Kimball's farm, at Webb's Landing. *Erigeron Discoidea*, or nodding rayless flea bane; also, several specimens of the giant sunflower.

A paper, by Theodore Gill, was read "on the *Scombrotoxis salmonens*, of Peters and its identity with *Anoplopora fimbria*." This was in relation to a form of fish existing at Vancouver Island.

R. E. C. Stearns read a paper on wood-eating marine animals. The proceedings of this meeting were of little general interest.

THE STRIKES expected in New York have not been made as anticipated. The Presidents of several divisions of the Laborers' Union Benevolent Society were present at a recent meeting in New York and stated positively that no strike would be made, as the members were satisfied with their wages and hours. It is said the whole story originated as a newspaper sensation.

BRISTOL DISTRICT, Nevada, is excited over rich discoveries of silver.

GERMAN MINING COMPANIES.—We learn from Germany that, owing to the removal of the political uncertainty which before the late war had kept industrial enterprise in constant check, business has been exceedingly prosperous. The following is a list of dividends lately paid:—Erzgebirge Coal Company, Zwickau, 80 per cent.; Fortuna Coal Company, 70; Zwickau Coal Company, 45; Harpen Coal Company, Westphalia, 25; Neu-Essen Coal Company, 20; Holland Coal Company, 22; Concordia Coal Company, Oberhausen, 10; Aplerbeck Iron Works, 12; Herde Iron and Steel Works, 8; Styrum Iron Industry, 18 Thale Iron Works, Hartz, 20; Tarnowitz Iron Company, Silesia, 18; Stolberg Lead and Zinc Works, 8; Griesheim Chemical Works, 10; Berlin Engine Works, 11; Cologne Engine works, 12; Chemnitz Engine Works, 22½; Chemnitz Engine and Tool Company, 14.

Decision in Regard to Swamp Land in California.

A letter has been addressed to the Commissioner of the General Land Office to the Surveyor-General of California, establishing important principles in regard to swamp land grants to various States under the Act of July 23d, 1866. The questions decided hereby arose in reviewing the action of the Surveyor-General of California on a large tract of alleged swamp land, known as Big Meadows, and situated in a valley in the Sierra Nevada.

Commissioner Drummond says: "In your report you refer to the altitude of the lands under consideration. As the same point was made by the attorney and considered by you as a reason for rejecting the claim of the State in the Sierra Valley case, and also in that of Mountain Meadows, I again allude to the subject for the purpose of saying that it makes no difference how high or elevated the lands may be, if they are in fact swamp or overflowed, and rendered unfit for cultivation by water flowing from surrounding lands still higher.

While very low lands may be perfectly drained so as to be susceptible of cultivation, marshes and lakes are found in most elevated regions, and dry lands in low valleys; therefore each case must be decided upon the facts. The question to be determined is not one of altitude, but of quality. If elevated lands are found to be swamp or overflowed, and thereby rendered unfit for cultivation, they must be awarded to the State under the grant; and if low lands are found to be dry, the claims of the State must be rejected.

"Another point urged by the attorney, and considered by you as a cause for rejecting the claim of the State, is that the lands produce wild grass, which is valuable for pasturage and hay. Natural productiveness has no bearing upon the question except as evidence tending to show the character of the lands; and the fact that the lands produce wild grass fit for pasturage or hay is not evidence for or against their swampy character, unless we take into consideration the kind of grass produced. Some kinds of grass grow on dry lands only; others grow on swampy lands only.

The question to be considered in this connection is, not whether the lands in a natural state produce something of value, but whether they are so swampy or overflowed as to be rendered thereby unfit for cultivation. If they are, they go to the State, under the grant, however valuable their natural productions may be. But if they are in fact dry, they do not inure to the State, although they may be unproductive and worthless. A tract of land may be very valuable for its timber, its wild grasses or cranberries, and yet be clearly and unquestionably swampy or overflowed and unfit for cultivation until drained or reclaimed.

A cranberry marsh may in its natural state enrich its owner, and yet be so swampy as to render it impossible to cultivate the land. On the other hand, a tract of land perfectly dry may be unproductive and utterly worthless. Therefore I think it is clear, that while the natural state or condition of the land is to be considered as determining the right of the State, the kind, quality, or nature of its natural productions are not matters of consideration except so far as they may be evidence of the character of the land.

"Another point urged in these cases against the claim of the State is, if the lands should be drained, irrigation would become necessary to the production of crops. This is a virtual admission of the fact that the lands are swampy, and I cannot see how irrigation or anything else necessary to cultivation after reclamation can affect the right of the State to them under the grant, if they are swampy or overflowed in their natural State.

The attorney opposed to the State asserts that irrigation is a part of cultivation. He is undoubtedly correct. Therefore it would be just as unreasonable to decide that the lands are not swampy, because it will become necessary to plow them after they are drained to make them productive, as it would to decide that they are swamp lands because irrigation will become necessary for the same purpose.

The testimony fails to show that other crops than grass could be produced, if the land were reclaimed. On the contrary, it is in evidence in all cases investigated in regard to similar lands, such as the Sierra Valley and the Mountain Meadows, as well as land now under consideration, that good crops of potatoes, oats, beans, peas, barley and even wheat can be grown successfully, and had been grown on such lands as were free from water early in the season.

After a careful examination of the evidence, Commissioner Drummond approves the California Surveyor-General's decision that some 6,280 acres of the tract in controversy are not swamp and overflowed, within the meaning of the Swamp Land Act, and that 680 acres are swamp lands. In regard to the remaining 1,420 acres, Drummond reverses Hardenbergh's decision, and decides that they are also proved to be so overflowed in a majority of seasons as to be unfit for cultivation, and must be awarded to the State.

This decision affects large interests of the Central Pacific Railroad Company, as much of their land involved in similar controversies will be included in their land grants if not patented to the State of California as swamp and overflowed.—*Call*.

The Oxy-Hydrogen Furnace.

Mr. Levi Stevens, patentee of the Stevens furnace, which has been described at length in our columns, gives his own views on the operation of the furnace to the *Bulletin* as follows:

Will you allow me space in your columns to explain to the public my invention from my standpoint? Much has been said about burning water or steam, and many seem to entertain the idea that I claim to burn steam as steam, and from some statements I have heard I have been led to believe that I was not only burning steam but water with it. I do not wish to stand before this community, or any other, as the advocate of such a theory, or have any one suppose I am advocating it. Water is the product of combustion; it cannot enter into combustion itself until the gases composing it are separated and changed; then they cease to be steam or water? What I claim is that I have discovered conditions by which a highly combustible gas or vapor is formed of the combined vapor of steam, and hydro carbon, and the hydrogen of the steam is set free to take on its equivalent of oxygen again at the point of combustion. The laws which govern in this, as throughout nature, are positive and uniform, and when understood become subservient to man. It is a well-known fact that as you increase the temperature of water or steam, you destroy the electric cohesion between the hydrogen and the oxygen, and their affinity for each other; it is equally well understood that as you increase the temperature of carbon you increase its attraction for oxygen. This conceded, what remains to be done is to establish such conditions of heat as will destroy the attraction of the hydrogen for the oxygen, and increase the attraction of the carbon for the oxygen to such an extent that their relations are changed and a new combination formed. The conditions best adapted to promote this new combination or association of gases, so far as I have been able to determine, are to heat the steam to the temperature at which the carbon or hydro-carbon is decomposed, and to hold the steam and hydro-carbon vapors under pressure, or the pressure of the volume of escaping steam before they are ejected into the furnace. The necessary conditions for carrying on this process are established with the waste heat. Carbon, in perfect combustion, gives about 800 units of heat. Hydrogen gives about 3,300 units. If my positions are well taken, and I am not deceived, I get not only the 800 units of heat from the perfect combustion of the carbon, but 3,300 units from the combustion of the hydrogen eliminated from the steam.

I am confined to no particular form of carbon or hydro-carbon. Bituminous coal, wood, asphaltum or petroleum, all and every kind of carbon, are equally well adapted, and can be used by establishing such conditions that the gases are thrown off and used with steam, and the coke and charcoal burned in connection with the gases on grate bars or in the furnace.

AN EXPECTED STRIKE.—The telegraph informs us of an expected labor strike in New York, which if carried out will be seriously felt. It is said to be near at hand. The Eight-hour League claims to have \$100,000 in the treasury, and say they have doubled their means since the struggle of last year. Carpenters, plasterers, stone-masons, brick-layers, stair-builders, plumbers and house-smiths are now working on the eight-hour system, and, though satisfied with their present wages, they will strike against the contemplated return to ten hours. The piano-makers, upholsterers, varnishers and cabinet-makers are working ten hours, but are holding secret meetings to discuss the expediency of another eight-hour strike. Over fifty different Trades Unions in New York are committed to the eight-hour movement, and the probabilities are that many branches of manufacture will be disorganized this spring and summer.

ENGLISH RAILROAD IRON.—The quantity of railroad iron exported from Great Britain last year, amounted to 947,548 tons valued at the sum of £10,237,768. The value of this iron was unprecedented in the history of English iron-making, although the quantity exported has decreased since 1870. In that year there were 1,059,392 tons exported, but its value was only £8,756,552. The largest single customer for this iron was the United States, which took 472,760 tons last year, against 512,277 tons in 1871 and 421,824 in 1870. The total amount of railroad built in this country was 7,613 miles last year, while it was 7,878 miles in 1871 and 7,430 in 1870. The large sum obtained for the single item of railroad iron by England for one year gives us a good idea of the value of the iron interests of that country.

THE VIRTUE MINE.—The Baker City Democrat of February 26th says: "We are informed that the Virtue Mining Company intend to put up a new quartz mill this season, with twenty stamps; the mill will be located at the ledge about eight miles from Baker City. The necessary machinery was shipped from Portland to the Dalles the latter part of last month, and teams were immediately loaded at the Dalles with the machinery, and it is now on the road to this point. We understand that all the machinery in connection with this mill is of the latest improvements, and when ready for work will be as complete in all particulars as any on the coast.

Safety in Coal Mines.

Experiments are being made in the Catacombs of Paris to illustrate the efficiency of a new apparatus for preserving the life of miners against fire damp. The experiments, aside from the novelty of the situation, are rendered quite interesting from the strange manner they are carried on. In the center of a large opening is placed a large glass box or chamber, in which is placed a rabbit and a rooster. At the extremity of this chamber is a tin cylinder, closed at both ends, and an india rubber tube inserted in one end. A man dressed like a miner enters the glass chamber which is closed on him hermetically and proceeds to work with a pickaxe as if in a mine. He has on his back a small tin box, like a knapsack. The nostrils are closed by means of a spring like the central part of a pair of spectacles, and he holds in his mouth the end of a tube which connects with the tin box on his back. He tears up the ground and works around as if in a mine. The knapsack is intended to hold a supply of pure air and the tin cylinder a reserve fund of the same article. The glass chamber is then filled with carbonic acid gas, which in a few minutes kills both the rabbit and rooster. The lamp on the miners' breast burns, as it is supplied also with air from the can, but the torches in the chamber are of course extinguished. When the light of the lantern grows dim he draws upon the reserve fund of fresh air. Hydrogen and oxygen gas are then turned into the glass chamber but have no effect, the lamp being a safety lamp, and he himself being independent of the surrounding atmosphere.

The device is that of Captain Denarouze, who hopes to introduce it in coal mines particularly. Something of this kind has long been in use but was not intended for regular work. In cases of emergency, a bag of air was placed on the miners' back, his nostrils closed and a tube connecting with the bag placed in his mouth. By means of this device however, it would seem as if men could work for some hours, and the knapsack and cylinder replenished as occasion demands. If miners perish of choke damp after this, it will not be through the fault of science.

The Limestone Belt of California.

In the chapter on California in the U. S. Mining Commissioner's Report for 1871 occurs the following interesting paragraph:

Another prominent feature in the geology of this part of the country is the limestone belt, on which are found the early placers, noted for their immense yield from 1850 to 1855. This belt runs through all the southern mining counties, and can be traced continuously for nearly one hundred miles. Its course is northeast and southwest, and its width varies from half a mile to three or four miles, in some places contracting, at others expanding. At Sonora it is narrow, while at Shaw's Flat and Columbia, a few miles farther north, it is several miles in width. Throughout its entire length it was noted for the richness of its placer deposits, which were, however, merely superficial, rarely exceeding in depth six or eight feet, except in places where the limestone formation contracts, and at these points it has been worked to a depth of from forty to a hundred feet by following and cleaning the crevices. Throughout its length the limestone bed-rock has been deeply worn by the action of swiftly running water carrying boulders and debris, which have cut and carved it in the most singular and fantastic shapes to a depth of many feet. In many places remarkable underground caverns of unknown extent are found. One of these, exists near Cave City, El Dorado County, of many acres in extent, which has never been thoroughly explored, although discovered as early as 1852.

The rich flats near Columbia and Springfield, when discovered by the early prospectors, were covered with dense growths of pine, and the entire face of the country has been so changed by mining operations as to be unrecognizable to the miner of '49-'50. The richest portion of the limestone belt has been found on the east side of Table Mountain, in Tuolumne County, and it is very probable that the placers owed much of their wealth to the scattering and distribution by water of portions of the Table Mountain channel not protected by lava. There is strong evidence of the correctness of this opinion near Springfield, Columbia, and Shaw's Flat—all of these places being but slightly below the level of the ancient channel at its exposed points. These towns, and Sonora, Jamestown, Montezuma and Chinese Camp, owe their existence to this class of placers. Near the head of Table Mountain, where the basins and crevices on the limestone belt are deep, we find the towns of Murphy's and Vallecito, in Calaveras County, where mining is still prosecuted on a small scale by means of whips and pumps, with a fair profit, but the ground remaining to be worked is limited. At these points the Table Mountain is much broken up

and loses its identity as a continuous range. The "flats" between the monad-like elevations have proved exceedingly rich, but all efforts to drain them have proved pecuniary failures in consequence of the great length of tunnels required.

The towns of Columbia, Springfield and Sonora, once the most populous of the Southern mines, were built on the best placer ground, and town lots are now more valuable for mining purposes than for business and residence. Placer mining in their vicinity has been virtually abandoned to the Chinese, who are satisfied to work ground which has been panned through the sluice-boxes two or three times. It often happens in these towns that a lot with a brick house on it is bought and the house torn down, merely for the purpose of taking the gold from the ground. As some of these towns are very much decayed, property of this kind can be bought for prices which leave an ample margin of profit after sluicing out the ground.

Forest Culture

While on our last weekly tour after items, we visited the farm of our pioneer forest planter on this coast, Mr. James T. Stratton, about two miles north east of this town, and were surprised at the astonishing growth the trees on his Eucalyptus Plantation have made during the past year. We have referred briefly to this enterprise several times, but as forest planting is largely engaging the attention of our farmers at the present time, and indeed of all who feel interested in the future welfare of our State, we think a more extended description of it would be interesting to our readers.

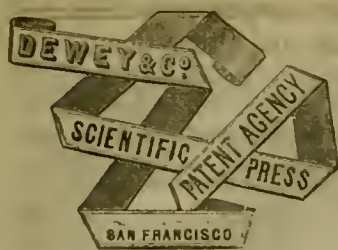
Until the practicability of forest culture was demonstrated by Mr. Stratton the opinion was generally entertained that we would always be compelled to depend entirely on distant points for our supply of the hard woods. The example which has thus been set will be worth millions to our State, and already we hear of several capitalists who are contemplating a like venture on a large scale. We learned from Mr. Stratton that his intention was first directed to the subject of forest culture in 1869, while observing the wonderful growth of the Eucalyptus or Australian Gum tree at his residence in Oakland, and having in April of that year secured all the seed he could obtain from them he immediately planted them in a nursery and succeeded in raising about 40,000 young trees; about 30,000 of which he planted in November and December of that year in a permanent plantation, 8 feet apart each way, covering about 54 acres. These were all the variety Eucalyptus Globulus or Blue Gum of Tasmania, are now generally 35 to 40 feet high and from 5 to 9 inches in diameter 2 feet from the ground.

In the spring of 1871 he planted about 50,000 more Blue Gum, covering about 60 acres; choosing for this planting a high hill, the soil of which is quite sandy and is classed, by farmers, among the poorest soils in this vicinity. Every one predicted a complete failure in this field and old practical farmers were inclined to question the judgment of their new competitor for agricultural honors, but the result shows that he acted wisely, as the trees are perfectly at home, and are making a growth nearly equal to that of the first planting, which was on rich valley land. A month ago these trees were from 12 to 25 feet high and 2 to 4 inches in diameter, but the proprietor has recently had them cut back to 10 feet to prevent them from becoming top heavy and hence liable to be blown down when the ground becomes soft during our long rains. In the spring of 1872 he added to the hill 20,000 more trees of various varieties—Blue Gum, Red Gum, Iron Bark, Stringy Bark, &c., all of which are doing well and looking as healthy as if they were growing on their native Australian hills.

Since the enterprise was started the medical value of the tree has been discovered, and the hospital experiments that have been made by Dr. J. S. Coleman in San Francisco indicate that the extract of its medicinal properties is doubtless destined to become a valuable substitute for quinine as an anti-periodic tonic and febrifuge, and that it is an invaluable remedy in diseases of the kidneys, bladder, &c. So abundant is the active medicinal principle in the leaves of this tree, as determined by Dr. Coleman's experiments that should quinine be entirely supplanted by the new remedy, Mr. Stratton estimates that his Eucalyptus forest alone could supply the demand for the whole United States.

As we have stated the trees of the first planting are 8 feet apart, those subsequently planted being 6 by 8 feet apart. It is intended to bring to cut out the poorer and scrubby trees when they are about five years old, and a second cutting about two years later, leaving about 150 on an acre to remain for timber. These earlier cuttings will only be useful for fuel, but will pay all the previous cost of the enterprise.

He expects to begin cutting for timber at 10 years from the seed and thinks that he will then be able to show clear logs 12 feet long and 15 inches in diameter, worth at least \$5 in the tree and that in 20 years he will have trees 100 feet high and 2 feet in diameter, and from our own observations on the growth of these trees in different localities we believe his expectations will be realized.—*Alameda County Advocate*



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A Sequel to "AMERICAN MINES AND MINING."
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CONTENTS.

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The pan being filled, the motion of the muller forces
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The curved plates again draw it to the center, where it
passes down, and to the circumference as before. Thus
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Manna and Honey-Dew.

A paper upon the above subject was read before the Academy of Sciences, at their session, on the 3d inst.,—the paper was based on observations made by Mr. John Applegate, a former long resident in the San Joaquin valley.

Mr. Applegate is of the opinion that both manna and honey-dew descend from the heavens, like frost or mist, and that both are derived from the sweet aroma of wild flowers, which is carried up by the rarified atmosphere, and subsequently condensed and deposited like dew. A portion—the finer, dryer, and lighter particles—may be carried to a higher elevation, and into a cooler atmosphere, where it might condense more in the form of snow, falling in little pellets, as manna. He accounts for the appearance of these deposits in the fall, so long after the great mass of the flowers have disappeared, by supposing the sweet principle to be held in suspension in the atmosphere for a long time, drifting but slowly from the place of its origin. This theory would hardly be admissible, considering that the high winds of summer, in this latitude, and the farther fact that they come mostly from the ocean—a surface from which we can hardly expect much sweet honey-producing aroma to ascend.

Mr. A. alludes to the fact that while the honey-dew never fails to come in the fall, the appearance of manna is rare. He mentions only two seasons in which he has observed it—in the fall of 1861 (or '62) and that of 1872. It is noticeable that on both occasions its appearance followed immediately after summer of immense verdure. It appears only on the morning of the first cool weather in the fall, and covers the foliage and fences somewhat like frost—in the form of small, roundish, whitish grains or particles, quite sweet to the taste, and corresponding very closely with the description in Exodus of the manna upon which the Israelites subsisted during their sojourn in the wilderness; the honey-dew closely resembles that described by Josephine as descending upon the hands of Moses—sticky and sweet. The honey-dew is the sweetest of the two; but it has a ranker taste than the manna, and not so agreeable.

Mr. Applegate also alluded to the peculiarity connected with the collection and storing of this substance by the honey-bee. The bees collect both, and the comb-cells are found filled with both substances, when they are obtainable. The honey and manna, however, are never found in the same cells. The two substances are found in separate cells; but not promiscuously mixed. The cells so filled are found to occupy groups.

The question of the origin of the honey-dew and manna, is one which has never yet been satisfactorily settled. The objections to the above theory are manifest; but the difficulties in the way of attributing it to an exudation or deposit from insects is still greater. The honey-dew, when it occurs, is found covering all surrounding objects for miles. Trees, shrubs, grass, fences, and even the bare earth, are completely covered with it. Even the dry leaves upon the ground are so covered with the sticky substance, that they adhere to the sole of the boot to such an extent as to make its presence very uncomfortable.

It is impossible that it could be deposited in such abundance by the insect referred to, as oftentimes but few of the insects—a large species of the Aphid family—can be found; sometimes not at all, for long intervals.

We have at this office some specimens of the insect above referred to, preserved in alcohol; also some of the honey-dew, slightly diluted with water, in order to render it sufficiently limpid to be transferred to a vial. These specimens were furnished a year ago last fall, by Mr. Frank Carnana, of Greece Valley, and noticed by us at the time.

New Incorporations.

The following companies have filed certificates of incorporation in the County Clerk's Office, S. F.:

SUCCESS GOLD M. CO.—March 19. Location: Kelly's Quick Mining District, Calaveras county. Capital stock, \$250,000, in shares of \$50 each. Trustees: Herman H. Schaffer, Wm. H. V. Cronise, James L. Trask, R. Kolman and A. Clark.

PACIFIC CHEMICAL CO.—March 16. Object: To manufacture, import and deal in all kinds of drugs, chemicals, chemical apparatus and material pertaining to chemistry. Also to engage in assaying, refining ores, and other chemical processes. Capital stock, \$500,000, divided into 25,000 shares of the value of ten dollars each. Directors—Henry G. Hanks, Charles H. Denison, Geo. A. Treadwell, A. Treadwell and John N. Barber.

PACIFIC ASBESTOS MINING AND MANUFACTURING CO.—March 15. Object: To manufacture asbestos. Directors—S. F. Taylor, Geo. W. Blake, Jesse Cheney, James M. Allen and E. Chamberlin. Capital stock, \$100,000. The amount of stock which has been actually subscribed is \$11,500.

SAN FRANCISCO GAS LIGHT CO.—March 15. Object: Manufacturing and supplying gas and other illuminating materials, and for the supply of gas to the public. Capital stock, \$10,000,000, in shares of \$100 each. Trustees—H. H. Haight, C. B. Oresthouse, Jashel Clement, Louis T. Hays, J. M. Greathouse, Chas. H. Denison, and Howard Hays.

ARIZONA JEWEL CO.—March 13. Object: to mine for precious stones and metals in the Territory of Arizona or elsewhere. Capital stock, \$3,200,000, in shares of \$100 each. Trustees—A. P. Green, A. B. Rosalis, W. C. Reed, G. M. Berry and D. Marucci.

Meetings and Elections.

INUS G. M. CO.—March 15. Trustees—J. H. H. Williams, (President), Wm. Norris, Chas. E. McLane, H. T. Wheeler and T. P. Besch; David Wilder, Secretary. **PACIFIC CHEMICAL CO.**—March 16. H. G. Hanks, President and Superintendent; Geo. A. Treadwell, Vice-President; C. H. Denison, Treasurer; and A. Treadwell, Secretary.

CHAPMAN M. CO.—March 14. Trustees—D. L. McDonald, J. P. Cavallier, H. H. Flagg, Geo. O. Davies and C. A. C. Miller.

The Prayer Gauge.

A correspondent of the *American Artizan*, writes as follows.

Will you permit me to say a few words in regard to the "Scientific Test of Prayer?" The persons have been cured while being prayed for I have no doubt. But it matters little what the religious belief is of the person praying. A prayer uttered in a powerful manner to a Hindoo god of stone in the presence of a Hindoo patient, would, in some cases, be effective. I had a friend that was cured instantaneously by the laying on of hands while being prayed for; yet the author of that prayer believed that the members of all Christian churches will be snubbed.

I can cite instances where the deaf, dumb, and lame have been cured by the laying on of hands.

A person residing in this State was cured of an abscess in fifteen minutes by passes made over the subject.

Now, what is the cause of these remarkable cures? Magnetism is at the foundation of it all—changing the magnetic currents, imparting it where it is wanted, withdrawing it where there is an excess; withdrawing the old and imparting the new.

Anger, jealousy, fright, prayer, love, and revenge, each in the right place, are more or less efficacious. I speak from knowledge, having had an opportunity to study these things. I would not advise any one to cease praying; yet has it occurred to your correspondent, that in those nine days of prayer, millions of prayers were offered for the sick where one or but a few were cured, except through care and medicine? Faith and the imagination have a great deal to do in restoring the sick. W. L.

San Francisco Metal Market.

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Refined Bar, per assortment, per 100 lbs.....	—	@ —
Refined Bar, good assortments, per 100 lbs.....	—	@ —
Boiler, No. 1 to 4.....	05 1/2	@ —
Sheet, No. 5 to 9.....	06 1/2	@ —
Sheet, No. 10 to 12.....	07 1/2	@ —
Sheet, No. 14 to 20.....	08 1/2	@ —
Sheet, No. 24 to 27.....	09 1/2	@ —
Horse Shoes, per keg.....	9 00	@ —
Nail Rod.....	10 1/2	@ —
Norway Iron, per ton.....	54 1/2	@ —
Roller Iron.....	5 1/2	@ —
Other Irons for Blacksmiths, Miners, etc.....	6 1/2	@ 1/2
COPPER.—		
Braziers.....	35	@ — 38
Copper Tins.....	50	@ —
C. N. P. Pat.....	55	@ —
Sheet Copper, per 100 lbs.....	29	@ —
Sheathing, Yellow.....	29	@ —
Sheathing, Old Yellow.....	29	@ —
Competition Nails.....	29	@ —
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TRIP PLATES.—		
Plates, Charcoal, IX per box.....	14 50	@ 15 —
Plates, I C Charcoal.....	13 50	@ —
Rough Plates.....	12 50	@ —
Banco Tin, Slabs, per lb.....	40	@ 42 1/2
STEEL.—English Cast, per lb.....	20	@ 25 —
Flat Bar.....	22	@ —
Plough Points.....	16	@ 17 —
Russia (for mould boards).....	17	@ 18 —
Zinc Sheet.....	8 1/2	@ 10 —
NAILS.—Assorted sizes.....	5 1/2	@ 9 —

Leather Market Report.

Reported for the Press by Dolliver & Bro.]

SAN FRANCISCO, Wednesday, March 13, 1873.	
The price of sole leather continues the same. French Calf Skins still have an upward tendency, with prospects of further advance.	
City Tanned Leather, per lb.....	26 1/2
Santa Cruz Leather, per lb.....	26 1/2
Country Leather, per lb.....	25 1/2
Stockton Leather, per lb.....	25 1/2
Jodot, 8 Kil, per doz.....	\$50 00
Jodot, 12 to 15 Kil, per doz.....	55 00
Jodot, 16 to 18 Kil, per doz.....	55 00
Jodot, 20 Kil, per doz.....	55 00
Jodot, 24 Kil, per doz.....	55 00
Jodot, 28 Kil, per doz.....	55 00
Jodot, 32 Kil, per doz.....	55 00
Jodot, 36 Kil, per doz.....	55 00
Jodot, 40 Kil, per doz.....	55 00
Jodot, 44 Kil, per doz.....	55 00
Jodot, 48 Kil, per doz.....	55 00
Jodot, 52 Kil, per doz.....	55 00
Jodot, 56 Kil, per doz.....	55 00
Jodot, 60 Kil, per doz.....	55 00
Jodot, 64 Kil, per doz.....	55 00
Jodot, 68 Kil, per doz.....	55 00
Jodot, 72 Kil, per doz.....	55 00
Jodot, 76 Kil, per doz.....	55 00
Jodot, 80 Kil, per doz.....	55 00
Jodot, 84 Kil, per doz.....	55 00
Jodot, 88 Kil, per doz.....	55 00
Jodot, 92 Kil, per doz.....	55 00
Jodot, 96 Kil, per doz.....	55 00
Jodot, 100 Kil, per doz.....	55 00
Jodot, 104 Kil, per doz.....	55 00
Jodot, 108 Kil, per doz.....	55 00
Jodot, 112 Kil, per doz.....	55 00
Jodot, 116 Kil, per doz.....	55 00
Jodot, 120 Kil, per doz.....	55 00
Jodot, 124 Kil, per doz.....	55 00
Jodot, 128 Kil, per doz.....	55 00
Jodot, 132 Kil, per doz.....	55 00
Jodot, 136 Kil, per doz.....	55 00
Jodot, 140 Kil, per doz.....	55 00
Jodot, 144 Kil, per doz.....	55 00
Jodot, 148 Kil, per doz.....	55 00
Jodot, 152 Kil, per doz.....	55 00
Jodot, 156 Kil, per doz.....	55 00
Jodot, 160 Kil, per doz.....	55 00
Jodot, 164 Kil, per doz.....	55 00
Jodot, 168 Kil, per doz.....	55 00
Jodot, 172 Kil, per doz.....	55 00
Jodot, 176 Kil, per doz.....	55 00
Jodot, 180 Kil, per doz.....	55 00
Jodot, 184 Kil, per doz.....	55 00
Jodot, 188 Kil, per doz.....	55 00
Jodot, 192 Kil, per doz.....	55 00
Jodot, 196 Kil, per doz.....	55 00
Jodot, 200 Kil, per doz.....	55 00
Jodot, 204 Kil, per doz.....	55 00
Jodot, 208 Kil, per doz.....	55 00
Jodot, 212 Kil, per doz.....	55 00
Jodot, 216 Kil, per doz.....	55 00
Jodot, 220 Kil, per doz.....	55 00
Jodot, 224 Kil, per doz.....	55 00
Jodot, 228 Kil, per doz.....	55 00
Jodot, 232 Kil, per doz.....	55 00
Jodot, 236 Kil, per doz.....	55 00
Jodot, 240 Kil, per doz.....	55 00
Jodot, 244 Kil, per doz.....	55 00
Jodot, 248 Kil, per doz.....	55 00
Jodot, 252 Kil, per doz.....	55 00
Jodot, 256 Kil, per doz.....	55 00
Jodot, 260 Kil, per doz.....	55 00
Jodot, 264 Kil, per doz.....	55 00
Jodot, 268 Kil, per doz.....	55 00
Jodot, 272 Kil, per doz.....	55 00
Jodot, 276 Kil, per doz.....	55 00
Jodot, 280 Kil, per doz.....	55 00
Jodot, 284 Kil, per doz.....	55 00
Jodot, 288 Kil, per doz.....	55 00
Jodot, 292 Kil, per doz.....	55 00
Jodot, 296 Kil, per doz.....	55 00
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Jodot, 336 Kil, per doz.....	55 00
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Jodot, 344 Kil, per doz.....	55 00
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Jodot, 400 Kil, per doz.....	55 00
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Jodot, 424 Kil, per doz.....	55 00
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Jodot, 432 Kil, per doz.....	55 00
Jodot, 436 Kil, per doz.....	55 00
Jodot, 440 Kil, per doz.....	55 00
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Jodot, 448 Kil, per doz.....	55 00
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Jodot, 556 Kil, per doz.....	55 00
Jodot, 560 Kil, per doz.....	55 00
Jodot, 564 Kil, per doz.....	55 00
Jodot, 568 Kil, per doz.....	55 00
Jodot, 572 Kil, per doz.....	55 00
Jodot, 576 Kil, per doz.....	55 00
Jodot, 580 Kil, per doz.....	55 00
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Jodot, 612 Kil, per doz.....	55 00
Jodot, 616 Kil, per doz.....	55 00
Jodot, 620 Kil, per doz.....	55 00
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Jodot, 636 Kil, per doz.....	55 00
Jodot, 640 Kil, per doz.....	55 00
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Jodot, 660 Kil, per doz.....	55 00
Jodot, 664 Kil, per doz.....	55 00
Jodot, 668 Kil, per doz.....	55 00
Jodot, 672 Kil, per doz.....	55 00
Jodot, 676 Kil, per doz.....	55 00
Jodot, 680 Kil, per doz.....	55 00
Jodot, 684 Kil, per doz.....	55 00
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Jodot, 700 Kil, per doz.....	55 00
Jodot, 704 Kil, per doz.....	55 00
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Jodot, 720 Kil, per doz.....	55 00
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Jodot, 744 Kil, per doz.....	55 00
Jodot, 748 Kil, per doz.....	55 00
Jodot, 752 Kil, per doz.....	55 00
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Jodot, 760 Kil, per doz.....	55 00
Jodot, 764 Kil, per doz.....	55 00
Jodot, 768 Kil, per doz.....	55 00
Jodot, 772 Kil, per doz.....	55 00
Jodot, 776 Kil, per doz.....	55 00
Jodot, 780 Kil, per doz.....	55 00
Jodot, 784 Kil, per doz.....	55 00
Jodot, 788 Kil, per doz.....	55 00
Jodot, 792 Kil, per doz.....	55 00
Jodot, 796 Kil, per doz.....	55 00
Jodot, 800 Kil, per doz.....	55 00
Jodot, 804 Kil, per doz.....	55 00
Jodot, 808 Kil, per doz.....	55 00
Jodot, 812 Kil, per doz.....	55 00
Jodot, 816 Kil, per doz.....	55 00
Jodot, 820 Kil, per doz.....	55 00
Jodot, 824 Kil, per doz.....	55 00
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Jodot, 836 Kil, per doz.....	55 00
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Jodot, 844 Kil, per doz.....	55 00
Jodot, 848 Kil, per doz.....	55 00
Jodot, 852 Kil, per doz.....	55 00
Jodot, 856 Kil, per doz.....	55 00
Jodot, 860 Kil, per doz.....	55 00
Jodot, 864 Kil, per doz.....	55 00
Jodot, 868 Kil, per doz.....	55 00
Jodot, 872 Kil, per doz.....	55 00
Jodot, 876 Kil, per doz.....	55 00
Jodot, 880 Kil, per doz.....	55 00
Jodot, 884 Kil, per doz.....	55 00
Jodot, 888 Kil, per doz.....	55 00
Jodot, 892 Kil, per doz.....	55 00
Jodot, 896 Kil, per doz.....	55 00
Jodot, 900 Kil, per doz.....	55 00
Jodot, 904 Kil, per doz.....	55 00
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Jodot, 964 Kil, per doz.....	55 00
Jodot, 968 Kil, per doz.....	55 00
Jodot, 972 Kil, per doz.....	55 00
Jodot, 976 Kil, per doz.....	55 00

Gold Run Mining Company.—Principal place of business, San Francisco, California. Location of works, Nevada County, California. Notice is hereby given, that at a meeting of the Board of Directors, held on the fifteenth day of March, 1873, an assessment of ten cents per share was levied upon the capital stock of the corporation, payable immediately in United States gold and silver coin to the Secretary, Corner Market and Spear Streets, San Francisco, California. Any stock upon which said assessment shall remain unpaid on the fifteenth day of April, 1873, will be delinquent, and advertised for sale at public auction, and unless payment is made before, will be sold on Tuesday, the sixth day of May, 1873, to pay the delinquent assessment, together with costs of advertising and expenses of sale. C. C. PALMER, Secretary. 121-21, Cor. Market and Spear Streets, San Francisco, California.

Hardy Coal Mining Company.—Location of principal place of business, San Francisco, Cal. Notice.—There are delinquent upon the following described stock, on account of assessment levied on the twenty-eighth day of January, 1873, the several amounts set opposite the names of the respective shareholders as follows:

Names.	No. Certificate.	No. Shares.	Amount.
Warren Goodale	37 old	9	\$1.09 65
Edward McLean	6 new	41	41 00
Edward McLean	23 new	50	50 00
Edward McLean	24 new	150	150 00
Edward McLean	37 new	40	40 00
Jacob Hardy	12 new	10	10 00
Jacob Hardy	21 new	85	85 00
Jacob Hardy	22 old	1	1 00
Jacob Hardy	23 old	1	12 50

And in accordance with law, and an order of the Board of Directors, made on the 28th day of January, 1873, so many shares of each parcel of said stock as may be necessary, will be sold at public auction, at the company's office, room 6, No. 338 Montgomery street, San Francisco, on the 24th day of March, 1873, at the hour of 2 o'clock p. m., of said day, to pay delinquent assessment thereon, together with costs of advertising and expenses of sale. JACOB HARDY, Secretary pro tem. Office—Room 5, No. 338 Montgomery street, San Francisco, Cal. mrs-3t

Keystone No. One and Two Gold and Silver Mining Company. Place of business, No. 507 Montgomery street, San Francisco, California. Location of works, Wallapai Mining District, Mohave County, Territory of Arizona. Notice is hereby given that at a meeting of the Board of Directors, held on the eighth day of March, 1873, an assessment of twenty five (25) cents per share was levied upon the capital stock of the corporation, payable immediately in gold coin, to the Secretary, at the office of the Company, No. 507 Montgomery street, San Francisco, Cal. Any stock upon which this assessment shall remain unpaid on the fifth day of April, 1873, will be delinquent and advertised for sale at public auction, and unless payment is made before, will be sold on the fifth day of May, 1873, to pay the delinquent assessment, together with costs of advertising and expenses of sale. By order of the Board of Directors. T. E. JEWELL, Secretary. Office, No. 507 Montgomery street, San Francisco, Cal.

Lemon Mill and Mining Company.—Principal place of business, City and County of San Francisco, State of California. Location of works, Eureka Mining District, Lander County, State of Nevada. Notice.—There is delinquent upon the following described stock, on account of assessment levied on the twelfth day of February, 1873, the several amounts set opposite the names of the respective shareholders, as follows:

Names.	No. Certificate.	No. Shares.	Am't.
E Van Santen, Trustee	2	100	\$100 00
E Van Santen, Trustee	4	100	100 00
E Van Santen, Trustee	5	100	100 00
E Van Santen, Trustee	6	100	100 00
E Van Santen, Trustee	7	100	100 00
E Van Santen, Trustee	9	8	8 00
E Van Santen, Trustee	68	100	100 00
E Van Santen, Trustee	72	100	100 00
E Van Santen, Trustee	73	10	10 00
E Van Santen, Trustee	119	364	364 00
E Van Santen, Trustee	121	100	100 00
E Van Santen, Trustee	174	350	350 00
E Van Santen, Trustee	279	190	190 00
E Van Santen, Trustee	280	1542	1542 00
E Van Santen, Trustee	281	200	200 00
John Hahn	44	20	20 00
A Durand	45	25	25 00
Erhard Weislag, Trustee	50	50	50 00
L Ponton de Arce, Trustee	176	100	100 00
J C Bollinger	156	100	100 00
J C Bollinger	153	20	20 00
J C Bollinger	228	109	109 00
J C Bollinger	228	25	25 00
J C Bollinger	229	25	25 00
Erhard Weislag	190	2	2 00
Erhard Weislag	223	5	5 00
J M Briceland	278	450	450 00
J M Briceland	300	25	25 00
J M Briceland	301	25	25 00
T J Stack	56	50	50 00
T J Stack	57	50	50 00
T J Stack	234	100	100 00
Henry L Davis, Trustee	74	105	105 00
Leon Golly, Trustee	79	360	360 00
Joseph Winterburn	103	200	200 00
W H Richardson	101	100	100 00
J G Sowder	106	53	53 00
H Hochkroter	111	106	106 00
J O Collins	112	2	2 00
H O Henrich, Trustee	127	200	200 00
H O Henrich, Trustee	128	300	300 00
H H Schafer, Trn tee	135	500	500 00
H H Schafer, Trustee	136	500	500 00
H H Schafer, Trustee	145	1000	1000 00
H H Schafer, Trustee	206	100	100 00
H H Schafer, Trustee	209	19	19 00
H H Schafer, Trustee	220	100	100 00
H H Schafer, Trustee	221	44	44 00
H H Schafer, Trustee	281	25	25 00
H H Schafer, Trustee	139	200	200 00
H H Schafer, Trustee	140	200	200 00
Henry Steingger	151	40	40 00
Andrew J McGovern	163	50	50 00
A A Harvey	166	7	7 00
Edouard Culin	170	182	182 00
John C Benz	190	12	12 00
F W Lougee	197	63	63 00
Charles Collichon	226	80	80 00
John W Kohler	226	100	100 00
B Heringhl, Trustee	285	100	100 00
B Heringhl, Trustee	286	58	58 00
B Heringhl, Trustee	289	41	41 00
B Heringhl, Trustee	291	50	50 00
B Heringhl, Trustee	292	50	50 00
G M Johnson	231	30	30 00
D W Davies, Trustee	265	10	10 00
Daniel Wagner	267	10	10 00
John Miller	278	50	50 00
John Hahn, Trustee	283	15	15 00
F T Thibault, Trustee	not issued	53	53 00

And in accordance with law, and an order of the Board of Directors, made on the twelfth day of February, 1873, so many shares of each parcel of said stock as may be necessary, will be sold at public auction, at the salesroom of Messrs. Maurice Doré & Co., No. 327 Montgomery street, San Francisco, California, on Tuesday, the eighth day of April, 1873, at the hour of 12 o'clock, m., of said day, to pay delinquent assessments thereon, together with costs of advertising and expenses of sale. Office, 608 Merchant Street, San Francisco, California. 72111

Lady Esten Tunnel and Mining Company. Location of principal place of business, No. 35 New Merchants' Exchange, California Street, San Francisco, California. Location of works, Little Cottonwood District, Utah Territory. Notice is hereby given, that at a meeting of the Directors, held on the 17th day of March, 1873, an assessment (No. 2) of five cents per share was levied upon the capital stock of the corporation, payable immediately in United States gold coin, to the Secretary, at the office of the Company, No. 35 New Merchants' Exchange, California Street, San Francisco, California. Any stock upon which this assessment shall remain unpaid on the 17th day of April, 1873, will be delinquent, and advertised for sale at public auction, and unless payment is made before, will be sold on Tuesday, the sixth day of May, 1873, to pay the delinquent assessment, together with costs of advertising and expenses of sale. CHAS. S. HEALY, Secretary. Office, No. 35 New Merchants' Exchange, California Street, San Francisco, California. m22

Lady Franklin Gold and Silver Mining Company.—Principal place of business, city and county of San Francisco, California. Location of works, Silver Mountain Mining District, Alpine county, State of California. Notice is hereby given, that at a meeting of the Board of Directors, held on the 18th day of February, 1873, an assessment of fifty (50) cents per share was levied upon the capital stock of the corporation, payable immediately, in gold coin, to the Secretary, at the office of the Company, 507 Montgomery street, San Francisco, California. Any stock upon which this assessment shall remain unpaid on the thirty-first day of March, 1873, will be delinquent, and advertised for sale at public auction, and unless payment is made before, will be sold on Monday, the twenty-first day of April, 1873, to pay the delinquent assessment, together with costs of advertising and expenses of sale. J. S. LUTY, Secretary. Office, 507 Montgomery street, San Francisco, California. m22

Mansfield Gold Mining Company.—Principal place of business, San Francisco, California. Location of works, Kelsey Mining District, El Dorado County, California. Notice is hereby given, that at a meeting of the Board of Directors, held on the 17th day of February, 1873, an assessment (No. 1) of two and one-half cents per share was levied upon the capital stock of the corporation, payable immediately in United States gold and silver coin, to the Secretary, at the office of the company, room 14, 331 Kearny street. Any stock upon which this assessment shall remain unpaid on the 29th day of March, 1873, will be delinquent, and advertised for sale at public auction, and unless payment is made before, will be sold on Monday, the 14th day of April, 1873, to pay the delinquent assessment, together with costs of advertising and expenses of sale. WM. SMILL, Secretary. Office—Room 14, 331 Kearny street. mrl

Office of the Phenix Silver Mining Company. San Francisco, March 18th, 1873.—Location of principal place of business, Lander County, State of Nevada. The Annual Meeting of the Stockholders of the Phenix Silver Mining Company, for the election of Trustees, and the transaction of such business as may be presented, will be held at 10 o'clock, April 7th, 1873, at 1 o'clock p. m., at the office of the Company, Room No. 26, Hayward's Building, 419 California street, San Francisco, California. Transfer books will be closed April 4th until after the meeting. JOSEPH MAGUIRE, Secretary. m22

Piermont Milling and Mining Company. Location of works: Piermont, White Pine County, Nevada. Notice.—There are delinquent upon the following described stock, on account of assessment (No. 6) levied on the twenty-fifth day of January, A. D. 1873, the several amounts set opposite the names of the respective shareholders as follows:

Names.	No. Certificate.	No. Shares.	Amount.
Feusler, Mary P.	35	50	\$25 00
Feusler, Mary P.	36	20	10 00
Feusler, Mary P.	50	13	6 50
McClure, R. A.	25	583 1/2	291 67
Perkins, J. E., Trustee	23	1000	500 00
Perkins, J. E., Trustee	41	381	190 50

And in accordance with law, and an order of the Board of Directors, made on the twenty-fifth day of January, A. D. 1873, so many shares of each parcel of such stock as may be necessary, will be sold at public auction, at the office of said company, on Monday, the thirty-first day of March, 1873, at the hour of two o'clock p. m., of said day, to pay said delinquent assessment thereon, together with costs of advertising and expenses of the sale. W. V. CLARK, Secretary. Office—418 California St., San Francisco, Cal. ml5-3t

Rising Sun Consolidated Mill and Mining Company. There will be a meeting of the stockholders of the Rising Sun Consolidated Mill and Mining Company, at the office of the Company, No. 304 Montgomery street, on Wednesday, April 2d, 1873, at 1 o'clock p. m., for the purpose of adopting a Code of By Laws for the Company. J. M. CASE, Secretary. J. A. ALBERTSON, President. 12-28-2t

Silver Wave Mining Company.—Location of works, White Pine Mining District, Nevada. Notice.—There is delinquent upon the following described stock, on account of assessment (No. 10) levied on the twenty-ninth day of January, A. D. 1873, the several amounts set opposite the names of the respective shareholders as follows:

Names.	No. Certificate.	No. Shares.	Am't.
Crocker, J. H. Trustee	455	50	\$25 00
Crocker, J. H. Trustee	491	20	10 00
Crocker, J. H. Trustee	449	100	50 00
Fogle, L. C. Trustee	483	100	50 00
Fogle, L. C. Trustee	484	100	50 00
Fogle, L. C. Trustee	485	100	50 00
Gates, Wm. Trustee	528	50	30 00
Holmes, H. J. Trustee	534	44	22 00
Kent, R. F. Trustee	534	20	10 00
Martin, M. S. Trustee	339	20	12 00
Martin, M. S. Trustee	439	20	12 00
Richardson, E. A. Trustee	429	100	50 00
Richardson, E. A. Trustee	430	100	50 00
Richardson, E. A. Trustee	436	100	50 00
Richardson, E. A. Trustee	440	100	50 00
Richardson, E. A. Trustee	535	100	50 00
Richardson, E. A. Trustee	536	250	125 00
Richardson, E. A. Trustee	537	250	125 00
Robertson, Thos B. Trustee	519	300	150 00
Thomson, M. Trustee	538	50	30 00
Thomson, M. Trustee	530	180	90 00
Wesley, E. W.	467	18	9 00

And in accordance with law, and an order of the Board of Directors, made on the twenty-ninth day of January, A. D. 1873, so many shares of each parcel of such stock as may be necessary, will be sold at public auction, at the office of said company, on Tuesday, the eighth day of April, A. D. 1873, at the hour of 2 o'clock p. m., of said day, to pay said delinquent assessment thereon, together with costs of advertising and expenses of the sale. J. W. CLARK, Secretary. Office, 418 California street, San Francisco, California. m22

Spring Mountain Tunnel Company.—Principal place of business, No. 37 New Merchants' Exchange, California street, San Francisco, Cal. Location of works, Elv Mining District, Lincoln County, Nevada. Notice is hereby given, that at a meeting of the Board of Directors, held on the 15th day of March, 1873, an assessment (No. 5) of twenty cents per share was levied upon the capital stock of the corporation, payable immediately, in United States gold and silver coin, to the Secretary, at the office of the Company, No. 37 New Merchants' Exchange, California street, San Francisco, Cal. Any stock upon which said assessment shall remain unpaid on the 15th day of April, 1873, will be delinquent, and advertised for sale at public auction, and unless payment is made before, will be sold on the 5th day of May, 1873, to pay the delinquent assessment, together with costs of advertising and expenses of sale. By order of the Directors. J. M. BUFFINGTON, Secretary. Office, 37 New Merchants' Exchange, California street, San Francisco, California. ml5

Ohio Consolidated Gold Mining Company. Location of Works, West Point, Calaveras County, California. Principal place of business, San Francisco. Notice is hereby given, that at a meeting of the Board of Directors, held on the 11th day of February, 1873, the several amounts set opposite the names of the respective shareholders as follows:

Names.	No. Certificate.	No. Shares.	Am't.
Geo O Eckert	194	200	\$20 00
Benj Derry	185	100	10 00
J K Carlton	12	50	5 00
D E Spencer	23 to 31 incl'd	100	10 00
Joe Felton	25	50	5 00
J W Winter	40	50	5 00
W G Wayman	46	150	15 00
E A Richardson, Trustee	70	100	10 00
E A Richardson, Trustee	60	100	10 00
Emma Hinds	57	100	10 00
Emma Hinds	58	100	10 00
Emma Hinds	59	100	10 00
Emma Hinds	60	100	10 00
Emma Hinds	61	100	10 00
Wm T Reynolds	221	250	25 00
W A Knapp, Trustee	223	100	10 00
A M Daly	82	50	5 00
A M Daly	83	50	5 00
D M Homer	163	100	10 00
D M Homer	170	100	10 00
D M Homer	171	100	10 00
D M Homer	172	100	10 00
R P Franklin	187	50	5 00
R P Franklin	188	50	5 00
J W Seale	207	100	10 00
Jno H Wood, Trustee	208	100	10 00
Jno H Wood, Trustee	210	100	10 00
Jno H Wood, Trustee	212	100	10 00
Jno H Wood, Trustee	222	200	20 00
I E Johns	248	50	5 00

And in accordance with law, and an order of the Board of Directors, made on the eleventh day of February, 1873, so many shares of each parcel of said stock as may be necessary, will be sold at public auction, at the office of the Company, Room No. 1, 432 Montgomery Street, San Francisco, California, on the fifth day of April, 1873, at the hour of 12 o'clock, m., of said day, to pay said delinquent assessment thereon, together with costs of advertising and expenses of sale. W. A. UG. KNAPP, Secretary. Office, 432 Montgomery Street, over Donahue & Kelly's Bank, San Francisco, California. m22

Stanford Silver Mining Company.—Location of works: Sierra District, Humboldt County, State of Nevada. Notice.—There are delinquent upon the following described stock, on account of assessment (No. 1) levied on the 3d day of January, 1873, the several amounts set opposite the names of the respective shareholders, as follows:

Names.	No. Certificate.	No. Shares.	Amount.
Bowen, F. W.	68	100	\$100 00
Bowen, F. W.	69	100	100 00
Bowen, F. W.	70	100	100 00
Bowen, F. W.	71	100	100 00
Bowen, F. W.	72	500	50 00
Bowen, F. W.	73	100	50 00
Bowen, F. W.	74	100	10 00
Bowen, F. W.	75	100	10 00
Bowen, F. W.	76	100	10 00
Bowen, F. W.	77	100	10 00
Comins, Thomas	108	100	10 00
Comins, Thomas	109	100	10 00
Comins, Thomas	125	25	2 50
Clapp, G. W. Trustee	25	50	5 00
Clapp, G. W. Trustee	26	50	5 00
Clapp, G. W. Trustee	101	100	10 00
Clapp, G. W. Trustee	102	100	10 00
Clapp, G. W. Trustee	103	50	5 00
Fish, Chas H. Trustee	92	100	10 00
Fish, Chas H. Trustee	97	100	10 00
Fish, Chas H. Trustee	128	100	10 00
Fish, Chas H. Trustee	129	100	10 00
Fish, Chas H. Trustee	130	100	10 00
Fish, Chas H. Trustee	131	100	10 00
Fish, Chas H. Trustee	132	100	10 00
Huff, S.	46	100	10 00
Huff, S.	47	100	10 00
Huff, S.	49	100	10 00
Huff, S.	50	100	10 00
Huff, S.	55	100	10 00
Hazelhurst, Wm.	37	100	10 00
Hazelhurst, Wm.	38	100	10 00
Hazelhurst, Wm.	40	100	10 00
Hazelhurst, Wm.	41	100	10 00
Hazelhurst, Wm.	43	100	10 00
Hazelhurst, Wm.	44	100	10 00
Hoag, G. H.	15	200	20 00
Hamilton & Dryden	154	100	10 00
Pinney, Geo M.	3	100	10 00
Pinney, Geo M.	4	100	10 00
Pinney, Geo M.	5	100	10 00
Pinney, Geo M.	6	100	10 00
Pinney, Geo M.	7	100	10 00

Machine Builders.

ESTABLISHED 1851.

PACIFIC IRON WORKS,

First and Fremont streets,

SAN FRANCISCO

IRA P. RANKIN, A. P. BRAYTON,
GEO. W. FOGG, Superintendent.

Steam Engines and Boilers,

MARINE AND STATIONARY,

IRON AND BRASS CASTINGS

Mining Machinery of Every Description,

And all other classes of work generally done at first-class establishments, manufactured by us at the lowest prices, and of the best quality.

Particular attention paid to Jobbing Work and Repairs.
N. B.—Sole Agents for sale of HUNTOON'S CELEBRATED PATENT GOVERNOR.
GODDARD & CO.

FULTON

Foundry and Iron Works.

HINCKLEY & CO.,

MANUFACTURERS OF

TEAM ENGINES,

Quartz, Flour and Saw Mills,
Wey's Improved Steam Pump, Brodie's Improved Crusher, Mining Pumps,
Amalgamators, and all kinds of Machinery.

N. E. corner of Tehama and Fremont streets, above Howard street, San Francisco. 8-43

GEORGE T. PRACY, MACHINE WORKS,

109 and 111 Mission Street,
SAN FRANCISCO.

These Works have lately been increased, by additional Tools, and we are now able to turn out any kind of work, equal to and cheaper than any establishment in the State; that is to say:

STEAM ENGINES,
Flour and Saw Mills,
QUARTZ MACHINERY
Printing Presses,

AND MAOHINERY MADE OF EVERY DESCRIPTION.

Improved Safety Store Hoists,

Fitted with Cutting's Patent Cams, unequalled for safety, convenience and cheapness. This Hoist can be built for about half the price of any other in use. To be seen at HAWLEY & CO.'S.

ALSO, MANUFACTURER AND SOLE AGENT FOR
Pracy's Celebrated Governor.
TURNING LATHES, Etc., constantly on hand.
4v234f

UNION IRON WORKS, Sacramento.

ROOT, NEILSON & CO.,

MANUFACTURERS OF

STEAM ENGINES, BOILERS,

CROSS' PATENT BOILER FEEDER AND SEDIMENT COLLECTOR

Dunbar's Patent Self-Adjusting Steam Piston
PACKING, for new and old Cylinders.

And all kinds of Mining Machinery.
Front Street, between N and O streets,
SACRAMENTO CITY.

PACIFIC

Rolling Mill Company,

SAN FRANCISCO, CAL.

Established for the Manufacture of
RAILROAD AND OTHER IRON
Every Variety of Shafting,
Embracing ALL SIZES of

Steamboat Shafts, Cranks, Piston and Connecting Rods, Car and Locomotive Axles and Frames

HAMMERED IRON

Of every description and size.

Orders addressed to PACIFIC ROLLING MILL COMPANY, P. O. box 2032, San Francisco, Cal., will receive prompt attention.
The highest price paid for Scrap Iron. 9v143

THE RISDON Iron and Locomotive Works.

INCORPORATED.....APRIL 30, 1868.
CAPITAL.....\$1,000,000.

LOCATION OF WORKS:
Corner of Beale and Howard Streets,
SAN FRANCISCO.

Manufacturers of Steam Engines, Quartz and Flour Mill Machinery, Steam Boilers (Marine, Locomotive and Stationary), Marine Engines (High and Low Pressure). All kinds of light and heavy Castings at lowest prices. Cams and Tappets, with chilled faces, guaranteed 40 per cent. more durable than ordinary iron.

Directors:
Joseph Moore, O. J. Brennan, O. E. McLane,
Wm. Nevris, Wm. H. Taylor, Lloyd Tevis,
James D. Walker.

WM. H. TAYLOR.....President
JOSEPH MOORE.....Vice-President and Superintendent
LEWIS R. MEAD.....Secretary

GEO. W. PRESCOTT. C. W. SCHEIDEL. W. R. ECKART

PRESCOTT, SCHEIDEL & CO.,

MARYSVILLE FOUNDRY.

Corner of B and Fourth streets, Marysville, Cal.

MANUFACTURERS OF

STEAM ENGINES,

STATIONARY AND PORTABLE

SAW AND GRIST MILLS,

Hydraulic Machinery,

Quartz Crushing and Amalgamating Machinery

Of every description, constantly on hand.

Plans and estimates furnished upon application. Repairs upon all kinds of Machinery promptly made, and at moderate charges.

Having unrivalled facilities, we are prepared to make to order, at short notice, anything required in our line. Specimens of our work may be seen in all the mining regions on this coast.

OCCIDENTAL FOUNDRY,

137 and 139 First st., near the Gas Works, San Francisco.

STEIGER & BOLAND,

IRON FOUNDRY.

IRON CASTINGS of all descriptions at short notice. All orders punctually executed in time agreed on. Particular attention paid to making superior Shoes and Dies. Among the special castings of this Foundry are the well known CALLAHAN GRATE BAR, of superior merit for burning screenings—all size Bars. STRATTON'S JACK SCREWS, all sizes. Superior, compact and effective Horse Powers, Pumps, Agricultural Castings, Ingot Moulds, Assaying and Refining Retorts and Kettles, and a great variety of other and special castings.

STEIGER & BOLAND Proprietors.

Steiger & Boland are the sole Manufacturers of the Improved Hepburn Roller Pan. The patterns having all the improvements to those Pans, are at the Occidental Foundry, enabling the Establishment to deliver all pans and parts thereof with uniformity, finished in the best style, and at the lowest possible price. Pan Castings furnished the trade, with liberal facilities for erection, &c. All persons are cautioned against making, selling or using these Pans, except through the authorized agents and manufacturers, viz., Steiger & Boland, of the Occidental Foundry, S. F.

22v25-3m

WM. H. HEPBURN.

A. HANKE'S

IRON FOUNDRY,

COLLIER MAIN AND HARRISON STREETS,

Entrance on Main Street.....San Francisco.

Every Description of Ornamental Work,
Stove and French Range Work, grate and fender work,
small machines of all descriptions, house
work, etc., promptly attended to.
25v25-3m

CALIFORNIA BRASS FOUNDRY,

No. 125 First street, opposite Minna,
SAN FRANCISCO.

ALL KINDS of Brass, Composition, Zinc, and Babbitt Metal Castings, Brass Ship Work of all kinds, Spikes, Sheathing Nails, Rudder Braces, Hinges, Ship and Steamboat Bells and Gongs of superior tone. All kinds of Cocks and Valves, Hydraulic Pipes and Nozzles, and Hose Couplings and Connections of all sizes and patterns, furnished with dispatch.
PRICES MODERATE.
J. H. WEED V. KINGWELL.

THOMPSON BROTHERS,

EUREKA FOUNDRY,

129 and 131 Beale street, between Mission and Howard,
San Francisco.

LIGHT AND HEAVY CASTINGS,

of every description, manufactured. 24v150v

Miners' Foundry and Machine Works,

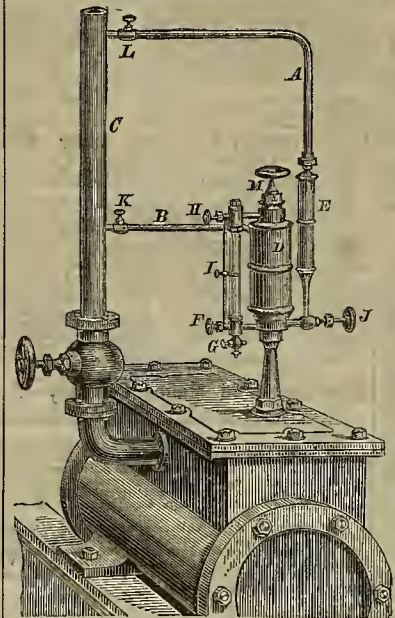
OO-OPERATIVE,

First Street, bet. Howard and Folsom, SAN FRANCISCO

Machinery and Castings of all kinds.

Machinery.

N. Seibert's Eureka Lubricators.



THE HIGHEST PREMIUM

Awarded by the Mechanics' Institute Fair, San Francisco, and State Fair, Sacramento, 1871.

These Lubricators are acknowledged by all engineers to be superior to any they have ever used; feed constantly by pressure of condensed water, supplied by pipe A, regulated under the oil by valve J, and forced out through check valve and pipe B into the steam pipe C; it then becomes greasy steam, passes to all the valves and cylinder at every stroke of the engine; glass tube I indicates amount used per hour. Packing on rods and stems lasts longer, and the rings on the piston will not corrode. One pint of oil will last from three to six days, according to speed and size of engine; I, sliding gauge; K, valve to shut off when engine stops; H, F, valves to shut off in case of frost; steam does not enter the cup; it is always cool; warranted to give satisfaction. Patented February 14, 1871. Manufactured by California Brass Works, 125 First street, S. F. 24v234f

Notice is hereby given, that the copartnership heretofore existing between A. J. Severance, Charles W. Randall and J. Gus. Burt, under the firm name of "Severance, Holt & Co.," is this day dissolved by mutual consent. A. J. Severance, having purchased all the interest of his late partners, will continue the business of manufacturing and selling Diamond Drills as before, under the style of A. J. Severance & Co. Dated San Francisco, Nov. 24, 1871.
Office, 315 California street. A. J. SEVERANCE,
CHAS. W. RANDALL,
J. GUS. BURT.

22-v23-4f

THEODORE KALLENBERG,

MACHINIST,

and Maker of Models for Inventors. All kinds of Dies
Stamps and Punches made. Also, all kinds of
Small Gears Cut.

Repairing done on very Reasonable Terms and in the
best manner. No. 32 Fremont street, S. F. 19v23-3m

The California Powder Works

No. 314 CALIFORNIA STREET,

SAN FRANCISCO.

Manufacturers and have constantly on hand

SPORTING.

MINING,

And BLASTING

POWDER,

OF SUPERIOR QUALITY, FRESH FROM THE
MILLS. It being constantly received and transported
into the interior, is delivered to the consumer within a
few days of the time of its manufacture, and is in every
way superior to any other Powder in Market.
We have been awarded successively

Three Gold Medals

By the MECHANICS' INSTITUTE and the STATE AGRICULTURAL SOCIETY for the superiority of our products over all others.

We also call attention to our

HERCULES POWDER.

Which combines all the force of other strong explosive
now in use, and the lifting force of the BEST BLASTING
POWDER, thus making it vastly superior to any other
compound now in use.

A circular containing a full description of this Powder
can be obtained on application to our Office.

16v20-3m

JOHN F. LOHSE, Secretary.

SHEET IRON PIPE.

THE

Risdon Iron and Locomotive Works

Corner Howard and Beale Streets,

Are prepared to make SHEET IRON AND ASPHALTUM
PIPE, of any size and for any pressure, and contract to
lay the same where wanted, guaranteeing a perfect
working pipe with the least amount of material.

Standard sizes of railroad Car Wheels, with special
patterns for Mining Cars. These small wheels are made
of the best Car Wheel Iron, properly chilled, and can be
fitted up with the improved axle and box—introduced by
this company, and guaranteed to outlast any other
wheels made in this State.

All kinds of Machinery made and repaired.
24v22-3m JOSEPH MOORE, Superintendent.

FRIEL'S PARAGON VAPOR STOVE.

PATENT APPLIED FOR.

The Great Labor Saver of the Household.

ECONOMY, CONVENIENCE AND SAFETY COMBINED.



JUST THINK OF IT—
No Wood, no Coal, no Coal
Gas, no Stove Pipe, no
Chimney, no Smoke, no
Ashes, no Dirt, no Wood
Boxes, no Coal Scuttles, no
Kindling Wood, but a
Friction Match, and the
Fire in Full Blast in
Half a Minute!

OVEN HOT IN TWO MINUTES.

Steak broiled in seven
minutes! Baked Beans in
thirty minutes! The fire
extinguished in a moment!
And the house unheated!
It has no rival in all
kinds of Cooking and Flat
Iron Heating, and com-
bines Economy, Conve-
nience, Neatness, Safety and
Durability! The LADIES
Welcome it; a little CHILD
can operate it, and

ALL RECOMMEND IT.

Prices from \$6 to \$25, according to size.

Manufactured and sold by

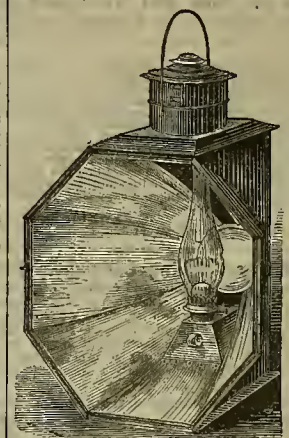
WM. FRIEL,

69 and 71 Fourth Street, San Francisco.
d26 v25-3m

PACIFIC LAMP MANUFACTORY.

EMIL BOESCH,

Patentee and Manufacturer of
LAMPS, LANTERNS AND REFLECTORS.



NEW MINING LIGHT.

The proprietor also holds letters patent covering
valuable improvements in Street, Ship and Railroad
Lamps.

All at the Lowest Rates.

Manufactory, N. W. corner Pacific and Kearny streets,
San Francisco, Cal. eow

AXLE GREASE.

To Millmen, Teamsters and Others.

Your attention is called to the very superior AXLE
GREASE manufactured by us for over 18 years.

Recent improvements in the chemical arrangement
of the lubricants used in its manufacture render its use
as serviceable on the lightest buggy as on the heaviest
team.

The extensive demand for the H. & L. Axle
Grease has enabled the proprietors to reduce its price
to as low a rate as any of the inferior compounds,
which are continually being forced upon the market.



See that this trade-mark (H. & L.) is on the red
cover of the package, and take no other.

HUCKS & LAMBERT,

Manufacturers & Sole Proprietors.

SAN FRANCISCO.

Factory.....145 Natoma Street.

Depot.....312 Jackson Street.
10v5-lamb-ly

NELSON & DOBLE,

AGENTS FOR

Thomas Firth & Sons' Cast Steel.

MANUFACTURERS OF
Sledges, Hammers, Stone
Cutters', Blacksmiths'
and Horse-Shoers'
Tools.

13 and 15 Fremont street, near Market, San Francisco
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SAN FRANCISCO

SCREW BOLT WORKS,

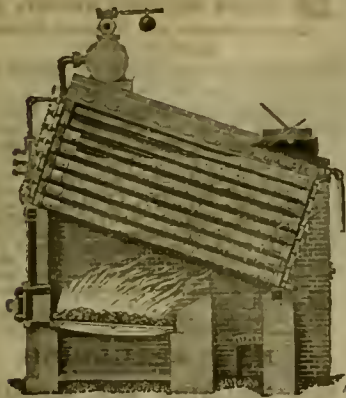
PHELPS BROTHERS, Proprietors

MANUFACTURERS OF ALL KINDS OF

Machine Bolts, Bridge Bolts, and Ship or
Band Bolts.

13 and 15 Drumm Street, San Francisco. 4v241v

Root's Safety Boilers.



IMPROVED AND PERFECTED

FIVE YEARS' EXPERIENCE,

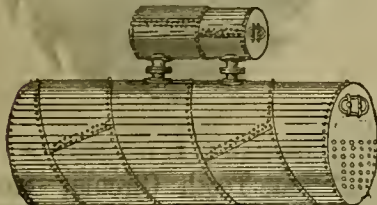
And the Sale of Nearly 800 Boilers.

For all manner of uses.
Send for Circular, and for further information address
L. C. PARKE,
Virginia City, Nevada.

San Francisco Boiler Works,

123 and 125 Beale Street.....SAN FRANCISCO
F. I. CURRY,

(Late Foreman of the Vulcan Iron Works,) Proprietor.



High and Low Pressure Boilers of all Descriptions.

SOLE MANUFACTURERS OF THE CELEBRATED SPIRAL BOILER.

SHEET IRON WORK of every description done at the shortest notice.
All kinds of JOBBING and REPAIRING promptly attended to.
17v25-3m

Portland Boiler Works.

MOYNIHAN & AITKEN,

311 and 313 Mission St., San Francisco.

T. J. MOYNIHAN.

J. AITKEN.

High & Low Pressure Boilers

OF ALL KINDS,

Built according to Drawings or Specifications, and SHEET IRON WORK executed at the shortest notice, and on the most reasonable terms.
Repairing promptly attended to, and at reasonable rates.

Agents for Robinson's Government Lock Valve.
4v26-3m

Steam Boiler Manufactory

—OF—

JAMES H. SHANLEY,

(Successor to D. McDonald.)

Oregon street, below Front.....SAN FRANCISCO.

ALL SORTS OF STEAM BOILERS
Made to order and repaired.

Also all kinds of Sheet Iron Work done promptly, and at prices to suit the times.
25v25-3m

From the Mining Summary in the Gold Hill News of December 28th.

The New Root Boiler
IS A PERFECT SUCCESS.

The saving in the amount of fuel consumed, alone amounting to 30 per cent. less than the cost of running the same machinery with the old style of Boilers.
For price list and prompt execution of orders please address

WM. HOLDREDGE,

137 Montgomery street, San Francisco,
General Agent for the Pacific Coast.
2v26-3m

J. W. Farren,

Wagon Maker and Blacksmith,

131 Beale St., between Mission and Howard,

SAN FRANCISCO.

Wagons, Trucks and Carts of every description manuf-
actured to order on the shortest notice. Repairing of
all kinds promptly attended to and all work guaranteed
to give satisfaction
4v26-3m

BUY BARBER'S BIT BRACE.

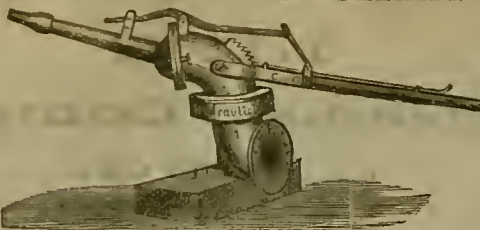
FISHER'S
KNUCKLE
JOINT
AND
NOZZLE

IS THE
Cheapest and Best
Hydraulic Machine
in use.

The only rollable party in the Hydraulic business who protects his patrons.
9v25-4f

HYDRAULIC MINERS, TAKE NOTICE—I hereby caution Miners and Manufacturers against making, buy-
ing, or using a Hydraulic Machine or Joint known as the Little Giant, manufactured and sold by R. R. &
J. Craig and Richard Hoskin, as the same is an infringement upon the invention of the machine known as FISH-
ER'S HYDRAULIC CHIEF, secured by Letters Patent, No. 110,222, dated Dec. 20, 1870. All parties participating
in such infringements will be rigorously prosecuted. Nevada, Jan. 13th.
F. H. FISHER.

HYDRAULIC CHIEF.



MAOHINES
Manufactured
TO ORDER,
to throw from
One
to an
eight-inch
STREAM.

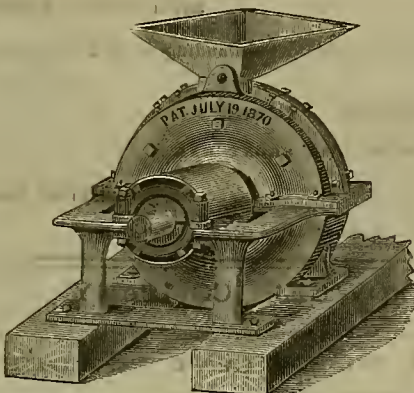
CAMERON'S

MINING STEAM PUMPS.

DAVID STODDART,

114 Beale Street, SAN FRANCISCO.

THE LIGHTNING MILL.



THE
LIGHTNING MILL
For Pulverizing Quartz,

"Charleston Rock," and all Native Phosphates,
Flint, Feldspar, Iron Ore, Manganese, Antimony,
Carbon, Corundum, Old Crucibles, Barytes, Brim-
stone, Slate, Soapstone, Graphite, Glass, Marble,
Plaster, Anthracite and Bituminous Coals, etc.

WM. STEWART'S

Patent Bone Mills and
Crushers.

For Grinding Bones, Rock, Quartz, and all hard
substances; also, Corn, Wheat, Oats, Barley, Coffee,
Spices, etc.

WALKER BROS. & CO., Twenty-third and Wood Streets, Philadelphia, Sole Manufacturers of Stewart's
Celebrated Patent Bone Mills and Crushers, A. W. Strauh & Co.'s Patent Revolution French Burr Mill and A.
Duval's Patent Centrifugal Pumps.

BURLEIGH
ROCK DRILLS

—AND—

Air Compressors.

The Burleigh Rock Drills, which have stood the test
of five years' constant use at the Hoosac Tunnel, and
which are now in use in nearly every State in the Union,
as well as in Europe and South America, are unequalled
in efficiency and economy by any other Drilling Ma-
chine. They are of various sizes, and equally well
adapted to Tunneling, Shaling, Open Cut or Quarry-
ing, and will drill six to ten inches per minute in gran-
ite. They are driven by steam above ground. The Bur-
leigh Air Compressor is the best engine yet devised for
furnishing the "air motor" for the many purposes to
which it is now being used.
They are to be used on the St. Gothard Tunnel, Swit-
zerland; Tunnel 13 miles long. We refer to the follow-
ing gentlemen and works:

Gen. Newton, U. S. A.Hell Gate Tunnel, L. I.
Mess. Shanley.....Hoosac Tunnel, Mass.
J. Dutton Steele.....Nesquehoning Tunnel, Pa.
Sidney Dillon.....Fourth Avenue Work, N. Y.
Col. RoehlingEast River Bridge Company, N. Y.

For further information, etc., address

L. C. PARKE,

VIRGINIA CITY, NEVADA.

AGENT FOR THE PACIFIC COAST. 115

J. M. STOCKMAN,

Manufacturer of

PATTERNS and MODELS,
(Over W. T. Garratt's Brass Foundry).

N. W. corner Natoma and Fremont streets, S. F. En-
trance on Natoma street. 6v23-3m

McAFEE, SPIERS & CO.,

BOILER MAKERS

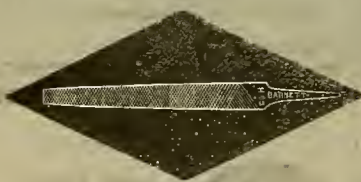
AND GENERAL MACHINISTS,

Howard st., between Fremont and Beale, San Francisco

SELL YOUR PATENTS

Through WRESTER & Co., 17 New Montgomery street,
SAN FRANCISCO, CAL.

BLACK DIAMOND FILE WORKS.



G. & H. BARNETT,

Manufacturers of Files of every Description,
Nos. 39, 41 and 43 Richmond street,
Philadelphia, Pa.

MILL SAW FILES A SPECIALTY.
18v25-1y

OAKEY & SON'S EMERY AND BLACK
LEAD MILLS, Blackfriars Road, London, England.
OAKEY'S WELLINGTON KNIFE POLISH
Packets, 3d. each; tins, 6d., 1s., 2s. 6d., and 4s. each.
OAKEY'S INDIA RUBBER KNIFE
BOARDS from 1s. 6d. each.
OAKEY'S SILVERSMITH'S SOAP (NON
MERCURIAL), for Cleansing and Polishing Silver, Elec-
tro-plate, Plating-glass, Marble, etc. Tablets, 6d. each
OAKEY'S GENUINE EMERY, GRAIN
AND FLOUR.
OAKEY'S EMERY AND GLASS CLOTH.
OAKEY'S CABINET GLASS PAPER,
BLACK LEAD, etc.
OAKEY'S GOODS SOLD EVERYWHERE
by Ironmongers, Grocers, Oilmen, Brushmakers, Drug
giats, etc. 11v25-1y

Betts's Capsule Patents.

To prevent infringements, notice is hereby given, that
Betts's name is on every Capsule he makes for the principal mer-
chants in England and France.
Thus enabling vendor, purchaser, and consumer not only to
identify the genuineness of the capsule, but likewise
the contents of the vessel to which it is applied.
The LORD CHANCELLOR, in his judgment, said that the
capsules are not used merely for the purpose of the crim-
inal, but that they are serviceable in protecting the wine
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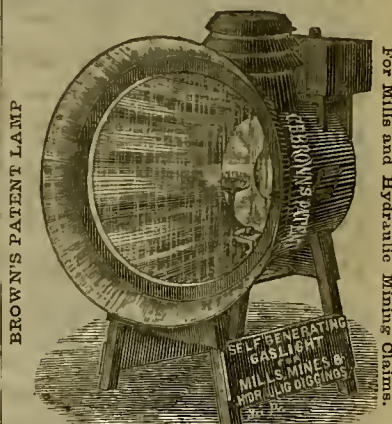
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that if I could not get another lamp, five hundred dol-
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The attention of the Medical profession is respectfully
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dial agent. Eucalyptus and its preparations have been
found useful in obstinate cases of intermittent and Marsh
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paroxysms of Asthma and Catarrh are greatly controlled,
and in various Kidney diseases and Catarrh of the Blad-
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This extract represents in a concentrated form the
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THE ELIXIR OF EUCALYPTUS.

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MINING AND SCIENTIFIC PRESS, SAN FRANCISCO.—The Press has for a long time been known as a leading journal devoted to the mining interests of this country, and under its admirable editorial management, the earliest, most accurate, and at the same time thoroughly reliable information upon all questions relating to mining, are obtainable. The table of contents of the number before us embraces a host of subjects which are of general interest, besides being eminently practical.—[Patent Star.]

C. P. R. R.

COMMENCING

Saturday, March 15th, 1873,
And until further notice, Trains and Boats will
LEAVE SAN FRANCISCO.

7.00 A. M. (Daily). Atlantic Express Train (via Oakland) for Sacramento, Marysville, Redding, and Portland, O., Colfax, Reno, Ogden and Omaha.

7.15 A. M. (Daily). Cal. P. R. R. Steamer (from Broadway Wharf)—Connecting at Vallejo with Trains for Callista, Knight's Landing and Sacramento; making close connection at Napa with stages for Sonoma.

2.00 P. M. (Sundays excepted). Stockton Steamer (from Broadway Wharf), touching at Vallejo, Benicia, and Landings on the San Joaquin river.

3.00 P. M. (Daily). San Jose Passenger Train (via Oakland), stopping at all way Stations.

4.00 P. M. (Sundays excepted). Passenger Train (via Oakland) for Lathrop, Merced, Visalia, Tipton, and Los Angeles, Stockton and Sacramento.

4.00 P. M. (Sundays excepted). Cal. P. R. R. Steamer (from Broadway Wharf) connecting at Vallejo with Trains for Callista, Knight's Landing and Sacramento.

4.00 P. M. (Sundays excepted). Sacramento Steamer (from Broadway Wharf), touching at Benicia, and Landings on the Sacramento river.

5.15 P. M. (Daily). Overland Emigrant Train (via Oakland)—Through Freight and Accommodation.

OAKLAND BRANCH.—Leave San Francisco, 7.00, 8.10, 9.20, 10.10 and 11.20 a. m., 12.10, 1.20, 3.40, 5.15, 6.30, 8.15, 9.20 and 11.20 p. m. (Sundays, 11.20 and 3.40 to Oakland only).

LEAVE BROOKLYN (for San Francisco), *5.30, 6.40, 7.50, 9.00 and 11.00 a. m., 1.30, 2.40, 4.55, 6.10, 7.55 and 10.10 p. m.

LEAVE OAKLAND, *5.40, 6.50, 8.00, 9.10, 10.00, and 11.10 a. m., 12.00, 1.40, 2.50, 5.50, 6.55, 8.20, 8.55 and 10.20 p. m.

ALAMEDA BRANCH.—Leave San Francisco, 7.20, 9.00 and 11.15 a. m., 1.30, 4.00, 6.30, and 7.00 p. m. (Sundays, 11.15 and 5.30 to Fruit Vale only).

LEAVE HAYWARD (for San Francisco), *4.30, 7.00 and 10.45 a. m., and 3.30 p. m.

LEAVE FRUIT VALE, *5.25, 7.35, 9.00 and 11.20 a. m., 1.30 and 5.30 p. m. *Except Sundays.

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These items will enable me to give a near estimate of the cost.

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They are more economical and cheaper than CAST iron shoes, as they wear from four to six times as long, and crush a greater quantity, as they retain their full diameter, never chipping from the edges. This, with the time saved in replacing worn and broken iron Shoes and Dies, and the great saving of freight to remote mills and mines, makes a vast difference in the cost of reduction of ores.

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Cast Steel Tappets, Cams, Picks and Hammers,

Which possess the same advantage of Economy and Durability, and deserve the special attention of Miners and others engaged in quartz crushing.

The Superior Strength of these steel castings—so fast that they can be FORGED AND WELDED as easily as bar steel—their cheapness and great accuracy, as compared with forged iron—cannot fail to make them desirable for many purposes, where forged iron and steel have heretofore been used. Among such articles we mention:

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Reaper Guards, Plow Shares, Mold Boards, Plow Jointers, etc.

Anvils, Sledges, Vices, Masons' Hammers, Blacksmith Hammers, Mattocks, R. R. Frogs, etc. And other articles requiring solidity and great strength.

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The system of transporting material, such as Ores, from the mine to the mill, Earthen embankments, Rock from quarries, etc., by means of steel wire rope, has been well tested and found more economical, advantageous and reliable than any other method of transportation; and to the annexed certificates in connection therewith I beg to call the attention of those interested:

EUREKA, Nevada, July 10, 1872.
T. M. MARTIN My dear Sir: On your leaving for San Francisco, it gives me great pleasure to hand you my written acceptance of the HALLIDIE TRAMWAY put up by you upon our mine in Freilburg.

It is a perfect success, discharging ten tons of ore per hour with two men's labor. It is perfectly simple in construction, and, as far as I can judge, there is nothing about it to ever get out of order, nothing to wear out. While ours requires but about two thousand five hundred feet of wire rope, I can see no reason why the line could not be extended almost indefinitely with equally happy results. Again, the carrying capacity might be doubled or quadrupled if desired. After several weeks trial upon our mine, the unanimous verdict of all who have seen it is a complete, unquestioned success. If this can be of any service to you, use it in the way you think proper. Very respectfully, O. O. GOODWIN.

EMMA HILL CONSOLIDATED MINING CO.,
Little Cottonwood, Utah.
Superintendent's Office, Sept. 28, 1872.
T. M. MARTIN, Esq., Sir: The Ropeway constructed by you (HALLIDIE'S PATENT) for the Emma Hill Consolidated Mining Company, has been built in a most substantial and workmanlike manner, and is at this time in splendid working condition. I most cheerfully accept the work for the Company, and recommend it to others wishing a sure and speedy transit for ores over places impracticable for wagon roads, etc. Respectfully,
L. W. COLBATH, Superintendent.

"The Vallejo works smoothly with the elevated wire tramway, which carries its load of ore as quietly and easily as if there was no winter or snow in the world."
"Whatever the objections to wire tramways may be on account of their cost, I have seen nothing yet that even approaches them in the facilities they afford for moving ore at all seasons of the year."—Correspondent Utah Mining Journal, Alta, Jan. 8, 1873.

The Vallejo Ropeway.
The Vallejo Tunnel Company's Tramway—Little Cottonwood, built on the HALLIDIE PATENTED PLAN, is a complete success. It is between 2,300 and 2,400 feet in length, and is supported by thirteen stations. The fall in this distance is about 80 feet, and the wire rope, which is three-fourths of an inch in diameter, will safely and easily deliver one hundred tons in six hours. The machinery is automatic, loading and unloading the sacks or hoppers. About one t and a half can be sent down at one time. The stations are about two hundred feet apart, and the entire apparatus is strong and safe. As the wire rope is elevated above the level of the surface of the hill, the tramway can be worked all winter long, without the slightest trouble.—Utah Mining Journal, Salt Lake, Sept. 23, 1872.
Mining Companies and others desiring to negotiate for the erection of this system of Ropeway, can communicate with me personally, or through Postoffice Box 944.

A. S. HALLIDIE, Patentee,
112 and 114 California Street, SAN FRANCISCO.

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For hoisting from mines, tram-mitting power, ship rigging, etc., of all kinds and sizes, on hand and made to order. Wire of all kinds and descriptions, furnished at lowest rates. A. S. HALLIDIE, 112 and 114 California St.

MINING AND SCIENTIFIC PRESS.

An Illustrated Journal of Mining, Popular Science and Progressive Industry.

BY DEWEY & CO.,
Patent Solicitors.

SAN FRANCISCO, SATURDAY, MARCH 29, 1873.

VOLUME XXVI.
Number 13.

California Miners.

California miners are with regard to morals a much abused class of men. The impression prevails away from this coast, and to some extent here, that their nights are mostly spent in the gambling saloon, brothel and in riotous dissipation. This is far from being the case, generally speaking, although wild and adventurous spirits do exist among them probably to a greater extent than among those who follow other pursuits. For this reason many suppose them all a demoralized set of men. It must be remembered that they are by force of circumstances comparatively isolated from the influence of female society, and men will naturally degenerate in such cases in some degree as far as social relations are concerned, but that they become entirely demoralized is a mistaken idea. The early pioneers who made the paths for future civilization and progress on this coast, were comparatively wild and lawless. Comparatively, we say, because there were no laws in the country and no one authorized to enforce them if there had been, and the evil spirits among them compelled the steadier portions to take the law into their own hands for self-protection—the natural law recognized even by the courts. The cases where such action is necessary in later days are few and far between. Still we who now reap the benefits which the hardihood and perseverance of these early-comers, aided in a great measure to confer upon us, should take into consideration the circumstances under which they lived, before pouring out wholesale condemnation on their courses of life, looking only on the dark side.

The miners employed at large mines, near the more prominent mining towns on the coast are naturally more subject to temptation than those whose claims are in isolated cañons among the mountains and who work their own claims. Although many of the men in the former instance "hach it" in their own cabins, the majority of them find it more convenient to board at some boarding house or hotel. As a consequence they often spend their evenings in the common sitting rooms of such places, or in saloons, unless they keep their own rooms. The round of amusements is exceedingly limited, and they fall back on bean poker, seven up or cribbage, to while away the time. Whether money is put up on the games or not is a matter of individual opinion; but when it is, the amount is generally small, except among regular gamblers who exist in every community and with whom we have nothing to do.

But let us take these men who live in their own cabins on the outskirts of small mining camps, or in isolated localities beside their claims. In California a great majority of the miners are among this class, who if they do not have claims of their own, work on mines which may or may not be incorporated, but whose stock is not called at our Stock Board. There are thousands of such mines scattered all over

the mining counties of the State from the most northern point to San Diego. The men join together in parties of four or five and some of them work for wages while the others work in the claim. When a little hard up, perhaps, the whole party will go to work in some mine for wages until able to work on their own claims again. Sometimes two men's wages will keep four others in "grub." These partnerships are conducted as honestly as if the partners were bound by all the legal documents possible, signed, sealed and recorded, whereas it is seldom that a scrap of paper is held by any of them. They divide the work and di-

camp fire. Black coffee, boiled beans, fried bacon, bread baked in a Dutch oven, or pancakes, form their frugal meal. But it is eaten with a relish that an epicure would envy, for industry, early rising, and regular habits are great promoters of appetite and digestion. Beside the cabin are the utensils with which they pursue their daily toil, and handling a pick or shovel invariably drives away dyspepsia.

Now let us take a peep inside the cabin and see what the domestic arrangements are. Somewhat neater than one would suppose from the appearance of the outside. No paper or cloth on the walls to be sure, but the nails

going repairs. The beds consist of a couple of pair of blankets without sheets or coverlet, made up on a straw mattress, with a coat or two for a pillow.

In a cabin such as we have attempted to describe does many an honest miner pass his time when not working in his claim. The evenings are passed in reading, smoking, talking and playing cards as each may desire. Those who wish to, may take a drink from the demijohn when they please, but drunkenness in such places is seldom seen. Those whose tastes lie that way usually pander to them when in town and semi-occasionally, but not when in their cabins. In places like this the most illiterate will take an interest in a book once in a while, and those who love to read pore over any stray volume which comes in their way with real enjoyment. The conversation of these men, like that of sailors, smacks of their calling. When "cabin-ing" together they will stick up for their "pards" through thick and thin, cheerfully take their share of the allotted household work, and should one of their number be sick he has the best possible care and attention. They take pride in their skill at cooking and in everything they have, except perhaps, their personal appearance, which they think, like Mr. Toots, "is of no consequence."

These men do not care a cent what the outside world thinks of them. They do their work and mind their own business and do not want any one to meddle with it. But as far as being all, or most all,

gamblers, desperadoes, drunkards, etc., as many people suppose, any one who told them so personally would find a fight on his hands as quick as if he killed a rat down in one of the levels of a mine on the Comstock lode.

FISHERY CULTURE.—The Sacramento Record says that Livingston Stone, Deputy United States Fish Commissioner, left for the East on Tuesday, and by the request of the Fish Commissioners of California, will send to this coast large quantities of eggs of various kinds of fish, among them black bass, silver eels, Schuylkill catfish, yellow perch, glass-eyed perch, lobsters, and 100,000 shad. In distributing these fish careful attention has been given to the existence of conditions best suited to their culture. The black bass will be first placed in the artificial ponds owned by A. T. Dewey, of Oakland, from whence they will be distributed throughout the State, and especially in the chain of lakes along the Sacramento river, commencing the first below Sacramento. The eels will be placed in the Sacramento below the R street levee. The catfish will be placed in Clear Lake. The shad are assigned to the San Joaquin; a portion, however, will be placed in the Sacramento above Tehama. The lobsters will be placed in Raccoon Straits.

THE LABOR STRIKE.—It seems that the strikers of the International Association will probably come, after all, judging from telegraphic reports from the East. Members of that body think that all the sections and trades should strike this year to enforce the eight hour law.



MINERS AROUND THE CAMP FIRE.

vide the profits or the loss as the case may be. These men are the representative miners of California. If the traveler goes among them he will find them courteous, hospitable, generous to a fault, sober, steady, hardworking men, and though rough in exterior habit, overflowing with the "milk of human kindness." Among them are many well educated men who are trying to make "their piles" in the mines but they cannot be distinguished from the rest of the crowd unless by their conversation. These miners are more regular in their habits than the generality of people in large cities. Early hours at night are the rule and they rise early by force of circumstances.

Let us make a little sketch for the uninitiated, not fanciful but well remembered by the writer, of the domestic arrangements of this class of men. One cabin is the type of the majority, for though they may differ in detail as to appearance and arrangements, the same general characteristics are common to all. The engraving shown on this page will serve to give an idea to the uninitiated reader of the exterior appearance of an isolated cabin, and a group of miners encircling the fire, while its truthfulness will be recognized by those of our friends who are now among such scenes. The little group have evidently just returned from their claim hard by, and have made a long day of it, for the moon is rising over the tree tops in the background. The "doctor" is preparing supper, the other boys are reading, taking it easy, warming themselves or gathering food for the

driven into the logs would spoil that. Four bunks on each side of the cabin, beside the door, with their heads toward it in a double tier. A small, rough table in the center, with several boxes and powder kegs for chairs, a small looking-glass near the little window with a comb suspended from a string beside it. These catch the eye of the visitor at the first glance. Then he becomes cognizant of some sacks of flour, one of potatoes, in the corner, a few sides of bacon suspended from a beam, a miner's pan or two, an old pick handle, some store clothes hanging from the nails, and a couple of common trunks, and several cracker boxes and carpet sacks, in company with gum boots protrude from under the lower bunks. The walls are ornamented with cuts taken from illustrated newspapers and a few photographs are tacked under two or three of the bunks. On a couple of shelves over the fire-place are a few well-worn books, which show signs of hard service. An old newspaper sticks out of the foot of one of the bunks. At the back of the cabin is the open fire-place in front of which the boys sit on winter evenings. In the summer they prefer to sit outside around the camp fire and smoke their pipes, spin yarns and dream of the time when they will have made their pile. On another shelf above the window is a bag of salt, several yeast powder cans, a paper of coffee, a couple of bottles of quicksilver, some plugs of tobacco, a worn pack of cards and a crib-board. In the corner is a bread pan, some molasses bottles, a demijohn and a pair of boots, under-

CORRESPONDENCE.

New York Capital in Mining.

(Letter from an Occasional Correspondent.)

NEW YORK, March 15th, 1873.

EDS. PRESS:—Since I have been here, in "the East," I have been struck with the surprising ignorance shown by New York capitalists in regard to mining interests. I happen to be in a good position for judging of this, and have been much interested in ascertaining, as far as possible, the actual feeling of the business community in the matter. I believe I am absolutely correct in affirming that the great majority of those who hold mining claims, with the intention of developing them, know next to nothing of their real, or even possible, value. Here is an instance of the mode of reasoning usually employed in reaching conclusions: A friend of mine, an excellent man of business in his own way, is badly afflicted with the mining fever. In speaking of the Great American Spread Eagle Gold, Silver, Quicksilver, Copper, Iron, Lead, Tin and Coal Mining Company (I may as well call it that as anything else; and, in truth, the name isn't so far out of the way), in which he has a large interest, he gave me the following, as an accurate summing up: "Paid for the original claim, \$75,000. Surveying and fees, \$8,000. Working expenses for first six months, (say) \$200,000. In two months will take out four hundred tons per week—call it two hundred, if you like. Assayed value of specimen gives \$7,485.72 per ton. Can't always depend on analysis giving a fair average yield, so we'll say half, or \$3,742.86 per ton. Total disbursements for the six months, \$283,000. Total income for four working months, \$11,977,152. Startle you, don't it? Well, we deduct nine-tenths, leaving a fair margin. That's \$1,197,715.20. Net profit, \$914,715.20, or over three hundred per cent in six months! Isn't it fair enough? Why I've divided the calculated amount by just 40, altogether."

Now, dear PRESS, you are doubtless used to this kind of talk in San Francisco. I remember it well enough. But what do you say to this? Another acquaintance, a photographer, showed me the other day a specimen he had been given to photograph by a "mining" friend. It really was a curiosity. A wad of dentists' foil well pounded and driven into a cleft of a piece of clear quartz!

These two stories look decidedly fishy, but they are of actual occurrence. Such things are heard of every day. If those who are personally interested in mining are so easily roped in, what can you expect from those who only hold stock for speculation, or never touch it at all? And the result. Can you wonder that, in this state of affairs, prudent men keep aloof altogether, and good opportunities go begging for want of capital? They cannot but see that the only parties who appear to make anything out of it are those who stake out the claims, and the well paid board of officers. It's like Santa Domingo—splendid thing to have a fat office in—but don't bite at the stock.

The problem of bringing about a clear understanding between miners, on the one side, and capitalists, on the other, is nearly as far from solution as ever. Men do not always see what is best for them, even millionaires; and if they will not—there's an end of it. Why, if European capitalists could only be brought to realize the difference between three-per-cent. and San Francisco real estate mortgages, we would all be so many pegs nearer the millenium. And the mining is on precisely the same footing. One investment is on a par with the other; for with our present knowledge and enlarged scientific basis, the mining of to-day is very different from the wild-cat-ism of old.

A. W., JR.

Hale & Norcross Mine.

The following items from the annual report of the Hale & Norcross mine for the past fiscal year shows a summary of the operations. The quantity of ore reduced compares as follows with previous years:

	Reduced.	Average.	Bullion.
1867, tons.....	28,636	\$47 32	\$1,355,220
1868.....	25,333	34 14	864,998
1869.....	16,330	23 69	395,146
1870.....	45,441	27 13	1,222,929
1871.....	64,974	25 13	1,638,844
1872.....	49,625	17 38	862,701
1873.....	40,417	16 28	657,950

During the past seven years this mine has turned out and reduced 270,962 tons of ore, varying in value from \$47.32 to \$16.23 per ton. The total out-turn of bullion during this period has been \$7,001,789, of which \$4,416,575 was in silver and the remainder in gold. From this large sum of \$7,000,000, stockholders ought to have realized something handsome. The fact is, only \$1,598,000 has been paid in dividends, while of this amount the Company have compelled stockholders to disgorge \$1,050,000 in assessments. The case may be stated thus:

	RECEIPTS.
Bullion product for seven years.....	\$7,001,789
Assessments seven years.....	1,050,000
Total.....	\$8,051,789

	DISBURSEMENTS.
Dividends seven years.....	\$1,598,000
Expenses seven years.....	6,400,675
Cash, February 28, 1873.....	53,114
Total.....	\$8,051,789

Deducting the assessments paid from the dividends received, we find the net profits to

stockholders to have been \$548,000, or a trifle over \$78,000 per annum, on an annual bullion product of \$1,000,000. Allowing the average capital employed to be \$1,000,000, the returns to stockholders show a small rate of interest. Of the 40,417 tons ore mined and reduced last year, yielding \$657,950, the sum of \$358,111 was paid for getting the ore to the mills and \$462,651 for reducing the ore to bullion. In other words, \$850,762 was paid to mine and mill a product of \$657,950. Under this view of the case, outsiders do not see where the profit comes in. Perhaps those who own and run mills for crushing ore can tell.

Deep Placer Mining.

Another of the series of free lectures at the Cooper Union, New York, was delivered on Saturday evening by Professor Silliman of Yale College, on "Deep Placer Mining in California." The following extracts are from the report of the New York Tribune: The lecturer introduced his subject by a description of the Ancient Geological Condition

of California as compared with that which now exists, showing how the gold region of the Sierra Nevada was reached, and remarking that all cañons in this country were formed ages ago by the action of running water, which left the heavy gold in small particles behind, in the crevices of the rock and the beds of the streams, by which men were able to get it by so simple a process as digging up the gravel and washing it out. In some portions of California there were areas where the deep lying gravels had been washed away so completely that all the gold was left behind, and as much as \$50,000 had fallen to the lot of a single "prospector" in a small area of perhaps 15 by 15 feet. But those things are only historic now; the days are past when men could pick up gold on the surface of California, and the primitive plan of "prospecting" with the pan was long ago superseded by more efficient methods.

He then described the various methods of mining in California, and the improvements that have been made. He then said: "But the most important step which has ever been made was the introduction of the hydraulic process, and there is an apparatus known as the 'knuckle-joint nozzle,' from which a stream of water six inches in diameter is projected against the face of the bank in an almost unbroken column with a force something like the discharge of ordnance." He then explained the nature and extent of the deposits, and referred to the remarkable phenomena of the

Table Mountains.

Which constitute a prominent feature of the gold region of numerous points from Oroville to Tuolumne. These Table Mountains were likened to the Palisades on the Hudson, being, like them, of volcanic origin, though of a much more recent geological age. They are, in fact, portions of the lava stream poured out so extensively during the great epoch of volcanic activity which closed the era of the ancient gravels in that portion of the world's history called by geologists the Pliocene. The speaker explained from diagrams upon the screen how these lava streams filled the valleys of

Ancient Rivers

Long before the alterations of the surface, due to subsequent denudation, which has had the effect of leaving this solid basalt unchanged almost completely, while the surface of the country surrounding has been cut down from 1,000 to 2,000 feet or more, by the valleys of existing rivers. The sagacity of the early explorers of the gold region of California detected the true nature of these remarkable dead rivers of the Pliocene time long before any hint had been given by the scientific world as to their nature. The adventurous and hardy miners undertook the exploration of these streams, now completely sealed over by the capping of hard basalt, by means of tunnels run in on the whole with remarkable skill, with a view to strike the ancient channel. These explorations were sometimes fruitful of remarkable results in the discovery of valuable deposits of the precious metals resting in the channels of the ancient river amid its sands and gravels and rounded boulders, mingled with the remains of ancient animals now extinct.

This Ancient Channel

Is at a depth sometimes of 300 or 400 feet beneath the level of the Table Mountain. This thickness is composed in part only of the ancient basalt, or lava streams, resting upon stratified deposits of volcanic sands and clays in the fine sedimentary portions of which are found the leaves of an ancient vegetation belonging to races of plants no longer found in California. Thus we reach the remarkable conclusion that what is now the elevated summit of the Table Mountains was formerly the depression of an ancient river, the valley of which, judging from the angle of the States, the upturned edges of which form the bed of the ancient stream, must have risen from 1,000 to 2,000 feet above the surface of the lava stream, thus proving that the general surface of the country has, subsequent to the outpouring of these Pliocene lavas, undergone a denudation amounting to not less than 3,000 to 4,000 feet of elevation.

From the consideration of the phenomena of the Table Mountains and the dead rivers which they entomb, the speaker passed rapidly to the discussion of the more

General Phenomena

Of the ancient rivers, the course and direction of which have been here and there detected in

the progress of exploration among the ancient auriferous gravels of the Sierra by the application of the hydraulic process. He illustrated this subject by a series of views thrown upon the screen, as well as by maps and sections showing the actual position of numerous points which have been well determined. Beginning in the high Sierras he illustrated and explained the great engineering works by which the waters of the melting snows are collected in artificial lakes and reservoirs for the feeding of the artificial canals or ditches, as they are commonly called in California, with the water, which is the essential element of success in this treatment of the auriferous gravels by the hydraulic process. Scenic views of portions of the deep-lying gravels, covered with primeval forests, as they are now seen in the headwaters of the South and Middle Yuba rivers, were also thrown upon the screen.

Placer Mining.

The speaker then mentioned in review the successive steps by which the precious metal is obtained from its resting place in the great mass of ancient alluvium. The upper portions of these gravels are always much poorer in gold than those which rest upon surface rock ("bed-rock.") The thickness of these auriferous gravels varies from 200 to 300 feet, up to nearly or quite 1,000 feet. The gold which they contain in the upper portions is sometimes not more than four or five cents in value to the cubic yard of gravel, and yet such is the power and economy of the hydraulic method that even this trifling quantity is profitably worked when the water and the gravel are both held in one ownership. As the upper portions of gravel are washed away the mass is found to become gradually more and more solid and compact, and changes in color from a red or tawny aspect, where it is sustained by the oxide of iron—changes by the influences of the atmosphere—until this color is replaced by the blue gravel which has given to the lower portions of this great mass the name by which it is familiarly known in California, as the "Great Blue Lead." As the "bed-rock" is approached the gravel mass becomes so compact that even the great force of the hydraulic washing is alone inadequate to break it up. Tunnels are then driven into the bank for a considerable distance, branches from which extend to the right and left, in which hundreds of kegs of gunpowder, and sometimes the gunpowder may be ignited simultaneously at numerous points by wires leading to an electric battery placed at a safe distance, after tamping the outlets securely to confine the explosion.

The lecturer proceeded to illustrate the several steps of the hydraulic process in the management of these great deep-lying gravels, which are destined to yield for an indefinite time in the future a steady and probably steadily increasing volume of the precious metals.

MAP OF LITTLE COTTONWOOD.—We learn from the Salt Lake Herald that Colonel Froiseth has finished his map of Little Cottonwood with its mining locations, and it was to be expressed last night for lithographing. It contains, distinctly shown, the twenty-one mines that have been surveyed for United States patents; some twenty tunnel locations, and about four hundred mining locations. Beside Little Cottonwood, including Alta and Central, and the numbers of their blocks as well as the names of the streets, it shows several of the more important portions of the Big Cottonwood district, and the mountain side leading up to American Fork district. This map is drawn on a scale of four hundred feet to the inch, from official surveys, and bears the indorsement of surveyor general Clements as to its correctness. When looking at it yesterday, and the large amount of careful work which it exhibited, the impression came strongly that it was one of the best things we had seen for conveying a correct impression of the mining region embraced, as it is, we think, decidedly the best map of the kind yet got up in this Territory. Colonel Froiseth writes us that the map is being engraved, and that it will shortly be placed on sale in this city. So much interest is being manifested in mining matters in Utah that the map will be very convenient for parties investing there or those who want to keep posted on the location of mines.

AGASSIZ MUSEUM.—Whatever may have been the result of the recent Hassler expedition, in which professor Agassiz embarked in scientific search of unknown denizens of the "vast deep," it is yet certain that from this voyage and others, contributions have flowed in from every source, and have given Harvard College the finest and most complete museum of "comparative zoology" in the world, in the specialty for which Professor Agassiz is famous. The collection of fishes is greater than that in the Jardin des Plantes, at Paris, and that in the British Museum put together. Professor Agassiz has devoted to it his life, and it will be his monument after death.

CINNABAR.—The San Luis Obispo Tribune says the Santa Lucia range from the San Simeon to the Arroyo Grande is rich in cinabar. Two mines of this mineral, situated near San Simeon, were recently sold to San Francisco capitalists. The Josephine mine, in the same range, and about twenty miles north of the town of San Luis Obispo, was opened several years ago, and upwards of \$100,000 have been expended in developing this mine. It is now yielding high grade ore, and manurea are in progress to erect additional furnaces. Discoveries of other deposits of cinabar have lately been made farther south in the range.

Manufactures of the United States.

It would be difficult, says the New York Journal of Commerce, to compress into smaller spaces the vast amount of useful information which appears in the tabular statement of the manufactures of the whole country. We have fortunately been enabled to obtain this highly important exhibit from advance sheets, in anticipation of this regular publishing day, about two weeks hence. Let no one be repelled by a chronic dislike of figures, from examining these remarkable statistics. This arrangement is simplicity itself. By a single glance across the line, one may trace the growth in manufactures of each State, between the decennial periods when the last three censuses were taken. Looking up or down the columns, he can instantly compare the development of any State, in this respect, with that of any other State; and be must be a dillard if the figures do not set him a-thinking on to the cause of the startling disparities he there finds. In point of suggestiveness—as key-notes to possible editorials, lectures and books—the tables are solid masses of text. We will not undertake to preach from them much to-day; but refer to this accompanying letter of our Washington correspondent for a few out of the many interesting deductions and moralizations which naturally arise from their perusal. To our mind, the most striking thought is this: What a terrific thing is civil war; how it blasts and cures the fair land over which it ranges! Here are the Northern States—led off by New York, Pennsylvania and Massachusetts, which always stood at the top in the order named—doubling or more than doubling the value of their manufactures between 1850 and '70; while the Southern States, nearly all of which exhibited large gains in this item of wealth between 1850 and '60, have made but small proportional advance in the last ten years, Virginia (including West Virginia), with all her recuperative energy, has gained but \$12,000,000 on her returns for 1860, whereas the census of that year showed an increase of \$21,000,000 over that of '50. Georgia is the only one of the distinctly Southern States which has doubled the value of her manufactured products, thus keeping pace with the average development of all the Northern States. All the other Southern States which staked their fortunes on secession, and were made to feel the sharpest effects of war, fall far behind the ratio of improvement which they would have shown had peace not been broken. Figures like these speak eloquently for peace—they are more potent than all the publications of the American Peace Society, the reports of their annual conventions thrown in. During the five years since the war (to 1870) the south would have made better headway in self-recovery had her disabilities been promptly removed and all the repressive measures toward her been discontinued. Material reasons combined with moral reasons in demanding that that act of justice and good policy should have been done long ago. Had it been done the Southern States would appear to much better advantage in the census of 1870 than they do; their citizens would feel more fully reconciled to a restored union, and the entire country would now be partaking, in abundant measure, of the rich blessing of peace. With these tables in view, we again press the claims of the South for immediate universal amnesty, in order that the least hindrance may be removed from her free natural growth. Let it be done, and we have no fear that the census of 1880 will not demonstrate the wisdom of that course in the great gain in southern manufacturing interests. Ohio, Indiana, Illinois, Iowa, Missouri, Minnesota, and all the thrifty States of the great West, though their chief wealth is agricultural, are yet highly prosperous, and waxing richer every day in manufactures. Nothing more forcibly exhibits their rapidity of growth in population and all that makes up civilized communities than the astounding leaps those States have taken in the manufacturing line in the past ten years. Iowa mounts up from \$14,000,000 to \$46,000,000; Michigan from \$32,000,000 to \$118,000,000; Minnesota from \$3,000,000 to \$25,000,000; Indiana from \$42,000,000 to \$108,000,000; Illinois from \$57,000,000 to \$205,000,000; Missouri from \$11,000,000 to \$206,000,000, and Ohio from \$121,000,000 to \$269,000,000. These illustrations are taken at random from the tables. The entire West—as well as the North—tells the same story of enormous gains in the value of manufactured industries of the past decade. All these figures, as a footnote apprises us, do not render full justice to the manufacturing industries of the country. For in the tables for 1850 and 1860 the statistics for mining, quarrying and fishing are included, whereas they do not appear in those of 1870. With this explanation the gain which we have pointed out becomes still more astonishing. Under a fully-restored union and fraternity, and a reformed Government, wise, just and economical, who can forecast the wonderful future of prosperity in store for the United States!

CAPITAL IN UTAH.—A dispatch from Utah says that letters from parties in London express much concern with regard to the management of Utah mines owned by them. It is stated that English capitalists are losing confidence, not as to the intrinsic value of the mines, but on account of the sharp speculative practices of parties interested in this Territory.

SCIENTIFIC PROGRESS.

Is Intellectual Labor a Transformation of Heat?

Brain work is accompanied by phenomena much the same as those attending manual labor. The tension of the brain, no less than the tension of the muscles, gives rise to heat, as may be ascertained without a thermometer. When a man is deeply intent on writing or thinking, his circulation grows more rapid; the arteries pulsate with increased force, and the brow is sometimes covered with perspiration; in short, it is clear that the nervous excitement under which he labors produces in his body a great amount of heat.

Are we to suppose that thought is the result of this development of heat, and that it will gain in force in proportion to the heat generated? We do not believe that any such relation subsists between heat and intellectual phenomena, and propose a physical interpretation for the increase of temperature accompanying cerebral action, which appears to be more rational.

The tension of the nervous system, and in particular of the brain, produces a kind of paralysis of the great sympathetic nerve. The functions of nutrition are retarded, but at the same time there occurs a dilatation of the blood vessels, and consequently an increased afflux of blood, which is diffused in great quantity through the entire system. The result is, a sufficiency of heat to facilitate the play of the organs; and then the mind is left free to give itself up to the subjects which engross it. The heat which is felt while the brain is active renders thinking easier, but has no part in the conception or creation of the works of the intellect.

This view of the increased circulation accompanying intellectual labor is confirmed by the results which we observe flowing from excessive brain work, namely: heaviness, trouble in the head, which can only be accounted for by a flow of blood to that region; then, in spite of this admonition one continues still to work, the consequence generally is cerebral congestion, or apoplexy, caused by protracted tension of the brain.—*Blondeau.*

CAUSE OF RUST IN IRON.—The study of that often-observed and unfortunate property which iron possesses of rusting or becoming oxidized when exposed to the action of moist air, has given rise to a variety of theories respecting this part that air and water each play in the operation. Mr. Von Hutton has made some experiments which lead him to conclude that the oxygen of the air cannot cause the rusting of iron unless dissolved in the water which is in contact with the iron. Even carbonic acid, when dissolved in water, will produce rust, which dry carbonic acid will not do. Rust, he thinks, is sometimes due to the decomposition of water, but that this never begins to take place until, for some other reason, the iron has begun to rust, or when the iron contains some other metal with which it forms a galvanic current. Solutions of alkalies prevent iron immersed in them from rusting, until the oxygen of the air dissolved in them penetrates to the iron, and this takes place more slowly in alkalies than with pure water. Alkaline solutions protect iron from the action of carbonic acid until all the alkali has been converted into a bicarbonate, and then if the solution takes up still more carbonic acid, it is able to attack the iron. The same authority, in discussing the protection of iron by contact with an electro-positive element, states that his observations have not shown any essential advantage to be gained in that matter.—*Sci. Am.*

ELECTRICITY.—When a rod of glass is rubbed with dry silk, vitreous or positive electricity is generated, which always flows to the north. When a rod of sealing wax is rubbed with dry flannel, resinous or negative electricity is produced, which always flows to the south. Then two kinds of electricity, though practically similar in capacity and character, are, nevertheless, opposite and mutually antagonistic in all their actions and effects. They combine, however, and harmoniously affiliate to establish an equilibrium between themselves, and they would forever exist in that state, if every other form of force was at rest. Friction upon glass, as we have already seen, evolves the one, and friction upon sealing wax evolves the other; but in neither case at the expense of either of the substances employed as a means of friction. The electricity is merely a conversion of the force employed into that agent. This is all that is known of the essence or origin of electricity.

CRYSTALLIZATION.—When evaporation takes place quietly in any saline solution, an active universal motion is perceptible, under the microscope, among the particles as soon as they become visible, as if each was endowed with life and intelligence. They act like so many animalcules or infinitesimal magnets. They repel and fly from each other in one direction and attract and attach themselves to one another in an opposite direction, finally assuming regular solid, geometrical forms. While attraction appears to be the basis of solidity, repulsion seems to assume a higher function, as if inspiring in matter a spirit of selection, adjustment and arrangement in certain specific orders of beauty.

PROCESS FOR EXTRACTING GOLD AND SILVER FROM COPPER PYRITES.—This method, invented by F. Claudet, is based upon the insolubility of the iodides of gold and silver. After the pyrites have been desulphurized by the addition of salt, they are placed in a barrel with a false bottom and lixiviated with acidulated water. The wash water consists of sulphate of soda, chloride of copper, and some chloride of silver. From this liquor the copper may be precipitated in a metallic state by means of sheet iron or iron scraps; but if the noble metals are to be separated, the waters from the three first extractions are collected, and the requisite quantity of iodide of potassium in solution is added to them. After having been left undisturbed for twenty-four hours, the clear liquor is drawn off, the vessel is then filled again, and iodide of potassium is added (in short, the operation is repeated) until a sufficiently large quantity of precipitate has collected. This contains sulphate of lead and copper salts, besides iodides of gold and silver. The salts of copper are washed out, whereupon the residue is mixed with zinc, in a finely divided form, which combines with the iodine. Hence the result is a mixture of gold, silver, lead, and some oxide of zinc, from which it is easy to separate the noble metals. Claudet produced in 1871, by this process, from 16,300 tons of desulphurized pyrites, 333,242 kilogrammes silver, and 3-172 kilogrammes gold, at a net profit of \$16,160.

REFINING GOLD BY CHLORINE GAS.—The application of chlorine to the refining of gold, as some of our readers may be aware, consists in passing a current of chlorine through the molten metal covered with borax. In a few minutes the silver present is converted into chloride, which floats on the surface, while the chlorides of lead, copper, antimony and arsenic escape. The fineness of the gold produced in this way varies from 991 to 997 in 1,000 parts; the few remaining thousandths parts of the product are silver, a quantity which is less than that resulting from any of the previously known processes. E. Dumas informs us that in the Mint in London as much as 750,000 kilogrammes of gold have been refined and toughened by the process, one kilogramme being 2,2046 lbs. avoirdupois. The apparatus is in use for only three days per month, and the cost of the chlorine gas is only from four to five francs for refining 5,000 kilogrammes of the gold. In order to refine 40 kilogrammes, a current of the gas for five minutes' time is sufficient. The silver is found in the borax covering the gold.—*Exr.*

NATURAL SULPHURIC ACID.—From a paper on the occurrence of native sulphuric acid in Eastern Texas, by J. U. Mallet, Ph. D., we learn that, not far from the Gulf of Mexico, and within twenty-five or thirty miles to the westward of the Neches river, there exist numerous small drainage-wells and shallow pools of water, strongly sour to the taste, this sourness being due to the presence of free sulphuric acid, which is accompanied by various salts, especially aluminum and iron sulphates. At most of these points gases are continually escaping, mainly hydrogen, sulphide and marsh gas, the bubbles burning readily on the application of a light. At the bottom of one of these ponds, known as Sour Lake, an earthy crust had been formed, in which free sulphur was observable. A thick, tarry variety of petroleum is also found oozing from the surrounding soil. The writer regards the occurrence together, in this region, of combustible gases, petroleum, sulphur, sulphuric acid and gypsum, as of great interest in its relation to the mineral history of native sulphur.

IMPROVEMENT IN THE MANUFACTURE OF SULPHURIC ACID.—M. de Hemptinne, a French manufacturing chemist, is said to have succeeded in establishing a new process for the concentration of sulphuric acid, by which it is claimed a great saving in cost is effected. Mr. H. states that the concentration of 100 kilogrammes, which costs 87 centimes by the platinum process, may, by his process (a vacuum method) be done for 44 centimes. He creates his vacuum by the condensation of steam in a cast iron boiler connected with a concentrating vessel of lead. The required strength of the leaden vessel to resist the atmospheric pressure is obtained by filling it with small irregular pieces of stone, such as will resist the action of the acid.

MEASURING THOUSANDTHS OF INCHES.—Nobody can take thousandths of inches from an ordinary scale; it requires an instrument with a Vernier, or a micrometer screw. You cannot even see the division of an inch in thousandths without a microscope. However, if you use this, you will have no difficulty in seeing not only thousandths, but ten thousandths of inches, with the greatest ease. Measures are ruled on glass, in which the inch is even divided in 100,000 parts, which is about the limit of the most powerful instrument. Such measures are called micrometers.

A NEW EXPERIMENT.—Mr. Elihu Thompson has made the observation that tin-foil, if wrapped about a few crystals of chlorate of potassa, can be made to detonate loudly upon being struck smartly with a hammer upon an anvil, or in a mortar. The phenomenon being precisely analogous to the well-known experiment of triturating sulphur and the chlorate. To the best of our knowledge, the observation that such metals as tin can be oxidized in this way, is a new one and worthy of notice.—*Jour. Fr. Institute.*

MATTER AND SPACE.—However vast space may be, matter must be circumscribed within it, like water within a lake. Hence matter is limited, while space is illimitable. Outside of matter is a limitless void—absolute space—nothing. Space is absolutely an illimitable void, within which suns, and planets, and moons push and pull, and rush and roll around each other, for the accomplishment of the wonderful ends for which they were created.

OZONIZED WATER.—A firm is at present engaged, in Berlin, in manufacturing ozonized water for medicinal purposes. From the prevailing opinion, which is not altogether without scientific probability, that the sanitary effects of sea air are to be ascribed to its relatively great proportion of ozone, the enterprise of the manufacturers will most likely be rewarded by a considerable demand for the substitute they claim to offer.

A THOUSAND DOLLAR PREMIUM has been offered by Uriah A. Boyden, Esq., of Boston, Mass., to be awarded to any resident of North America who shall determine by experiment whether rays of light and other physical rays, are or are not transmitted with a uniform velocity. The money has been deposited with the Franklin Institute.

MECHANICAL PROGRESS.

Effects of Magnetism Upon Iron and Steel.

It has long been known that both steel and iron were more or less structurally affected when under the influence of the magnetic current. One of Professor Tyndall's experiments shows the lengthening of a bar of soft iron whenever the circulation of an electric current round it causes it to take up the magnetic condition. Messrs. Treve and Chedeville have recently made experiments with a view to ascertain whether the influence of magnetism in any way alters the internal structure and tensile strength of cast steel.

They used two cylindrical moulds precisely alike, one of which was, however, in the center of a Ruhmkorff's coil charged by 12 Bunsen cells, while the other was left as usual. Both were filled with molten steel at the same time, and the electric current was allowed to circulate round the molten mass in the one mold until it was completely cool. At the expiration of ten hours the two steel cylinders were broken, and their fragments compared. It was then found that the grain of the metal differed very considerably in the two castings, being considerably finer in that subjected to magnetism during cooling. This experiment was repeated three times with the same result.

Comparative results were then made as to the resisting power of the two castings to extension and compression. In every case the strength of the magnetized steel was inferior to that of the unmagnetized.

Dr. Meyer of Hoboken, New Jersey, has also made experiments on the change in the dimensions of bars of steel and iron by magnetization. These experiments were performed with great care, with the aid of apparatus capable of detecting and measuring with precision a variation in length of one two-hundredth-thousandths of an inch. By means of this apparatus, he found that iron bars were elongated when a current of electricity was passed around them; when the current was interrupted, the bar shortened somewhat, but never again regained its original length. With annealed steel bars the result was the same; but with tempered steel, the results were altogether different. On passing the current around these they contracted, and on interrupting the current they contracted still further.

He also made some experiments to determine whether there was any change in volume in a hollow cylinder of iron when it was magnetized. For this purpose a hollow cylinder, closed water-tight with the exception of an opening in the upper cup, into which a glass tube with a fine bore was fixed, was filled with water so that the water stood in the glass tube some distance above the top of the cap. On passing a current of electricity around the cylinder, the water sank in the tube, showing that the capacity of the cylinder was increased. Other experiments showed that when a bar of iron was magnetized, an increase of temperature took place. This was beautifully shown by the above experiment, when contact was made and broken several times; the water in the cylinder was so heated that it overflowed the top of the glass tube.

STEEL RAILS.—Last month the large rolling mill of the Philadelphia & Reading Railroad Company in Reading, Pa., made the first steel rail ever manufactured in that city. The steel was obtained from the Midvale Steel Works, at Nicetown, near Philadelphia, and is of the Siemens-Martin process, and was furnished to the rolling mill in the shape of ingots of about nine inches square, in sections, and the rails were rolled into the ordinary pattern of sixty-eight pounds per yard. It is expected they will be as durable as any Bessemer steel rails made.

Railway Brakes.

The business of manufacturing railway brakes is much more important than is generally imagined. Seven companies for the manufacture of power brakes have been organized in the United States since 1869. And of the 444 railroads in the United States and Canada, more than one-sixth of them have already been equipped with power brakes operated by the engineers.

In England, from 1840 to 1866, there were patented twenty-two electric brakes; from 1835 to 1865, twenty hydrostatic brakes; thirty pneumatic brakes from 1838 to 1866, and fifty-four steam brakes from the year 1836 to 1866.

Power brakes, operated from the locomotive, are a very old invention, although they were never adopted by any railroad company in the United States until about three or four years ago.

The first power brake patent granted in this country was in 1847, and the total number granted up to the close of last year was fifty-nine. More patent on power brakes were granted in 1872 than from the organization of our Patent Office to the close of 1871, which strikingly illustrates the rivalry of the inventive genius of this country.

At a recent trial of a power brake on the Chicago and Northwestern railroad, a train of six cars, going at the rate of thirty-two miles an hour, was stopped in 19 seconds; the same train, going forty miles an hour, was stopped in 18 seconds, and within the space of 370 feet. The time in which to stop a railroad train is the all-important consideration. It surely would take three minutes to stop a train going at this speed with the ordinary hand brakes. A minute in railroading is sometimes a very important matter.

A bill was introduced in the House of Representatives to compel all railway companies to provide their cars with power brakes, so arranged that the engineer may, at any moment, apply power to the wheels of every car on the train. Penalties are provided against companies who fail to employ some kind of an approved power brake.

To Determine the Dimensions of Fly Wheels.

The rule given by Molesworth for weight of fly wheel rim is as follows: Multiply the average pressure on the piston, in pounds, by the length of stroke in feet and divide by 45 times the diameter of the wheel rim. The result will be the weight of the rim in hundredweights. To obtain the weight in pounds, multiply by 25 instead of dividing by 45. Haswell says that the weight of the rim should be from 85 to 95 pounds per indicated horse-power of the engine. Professor Thurston gives the following memorandum: The effect of a fly wheel will depend upon the proportion which the product of the weight into the square of the velocity of its rim bears to the quantity of work which is alternately stored up in it, and restored by it. The latter quantity will vary with the length of stroke of the engine, the size of its cylinder, the pressure of steam carried, and the point of cut-off. It would be difficult to construct an exact formula that would be adapted for general use, but the following rule will give good results with our best forms of engine with considerable expansion: Multiply together the area of the piston, in inches, length of stroke, in feet, and highest proposed steam pressure; divide the product by the square of the product of the diameter of the wheel, in feet, by its lowest proposed number of revolutions per minute. Finally multiply the result by 90,000.

This formula was first proposed in 1867, and has given satisfactory results. Its author prefers it, for ordinary purposes, to any other published.

To determine the sectional area of the rim from its weight, divide the given weight by ten times the diameter in feet, and the result will be very exactly the cross section of the rim in square inches.

It is, of course, better to make a fly wheel a little too heavy than a little too light, while a perfect regularity of speed is of very great importance.

SLATE ROOFING.—An item has been extensively circulated concerning the advantage of bedding roofing slate in hydraulic cement, over the usual method of nailing them on dry, which leaves them subject to be rattled by the wind, and be readily broken by accidental pressure. The cement soon settles and becomes like a solid wall. The additional cost of the plan is 10 to 15 per cent., but this, in virtue of the increased permanency claimed for the new plan, may really place a saving to its credit, in addition to which the greater security it affords against fire is a point in its favor.

AN IMPROVED CASK.—A Mr. Trimmer has recently invented a cask, which consists in making one or both ends partly or entirely of glass, so that the observer may see whether it is full when delivered, when it has become sufficiently empty to replace it with a fresh one, at what rate its contents are being reduced, and also when empty, whether the cask has been properly cleaned. The inventor in some cases, uses a cask head made entirely of glass, and in others a strip of glass let in vertically or diagonally, and properly secured from leakage.

Assessments, Meetings, Dividends.

NOTE.—In the Stock Boards an assessment is delinquent thirty days from the date of levy, exclusive of that date. The dates given in this list are those of the running offices.

[illegible]

Alhambra M. Co.	Merced.	1 50	Mar. 25	Apr. 26	May 20	J. C. Strauch.	210 Front-st.
Adair Nelson P. & N. Co.	Utah.	1	10 Jan. 27	Mar. 8	Mar. 31	R. H. Sitt-n.	579 California
Anzels Q. M. Co.	Cel.	1 50	Mar. 9	Apr. 3	Apr. 21	U. C. London.	408 California
Anthony G. M. Co.	Placer Co. Cal.	1	25 Jan. 29	Mar. 4	Apr. 17	W. J. Kip, Jr.	419 1/2 Cal.
Atlantic Pacific Con. G. M. Co.	Cal.	2	6 Feb. 21	Apr. 3	Apr. 17	N. J. Kip, Jr.	419 1/2 Cal.
Auburn G. M. Co.	Cal.	3	50 Feb. 12	Mar. 18	Apr. 8	R. Wegener.	414 Call on nat.
Cedberg Fint North Ex. Co.	Cal.	2	10 Feb. 13	Mar. 17	Apr. 17	J. N. Web-ter.	506 M. Montgomery
Chobokas Flat B. Vase Gravel M. Co.	Cal.	1	50 Feb. 14	Mar. 10	Apr. 27	H. Florio.	63 Washington
Chobokas Flat B. Vase Gravel M. Co.	Cal.	1	150 Feb. 14	Mar. 10	Apr. 27	H. Florio.	63 Washington
Eagle Q. M. Co.	Santa Barbara Co.	50 00	Mar. 8	Apr. 17	Apr. 23	Wm. H. Weston.	301 Montgomery
Enterprise Gravel M. Co.	New. Co. Cal.	1 00	Mar. 17	Apr. 16	May 6	M. Mc.Donnough.	Grass Valley
Enterprise Gravel M. Co.	Cal.	1	10 Mar. 15	Apr. 15	May 6	M. Mc.Donnough.	Grass Valley
Gold Run M. Co.	California	10	Mar. 15	Apr. 15	May 6	C. C. Palmer.	Or. Market
Grass Valley New M. Co.	Grass Valley.	5	7 Mar. 3	Apr. 7	Apr. 23	S. Fletcher.	Grass Valley
G. & Bishop S. M. Co.	Ely District.	1 45	Feb. 21	Apr. 18	Apr. 18	S. Phillips.	415 Montgomery
G. & Bishop S. M. Co.	Ely District.	1 45	Feb. 21	Apr. 18	Apr. 18	S. Phillips.	415 Montgomery
Hardy Q. Mining Co.	Cal.	1 00	Mar. 26	May 1	May 24	Jacob Hardy.	338 Montgomery
Haves G. & S. M. Co.	White Pine.	1	20 Feb. 28	Apr. 12	May 8	H. C. Howard.	332 Montgomery
Homiguen Mining Co.	Lower Cal.	7 30	Mar. 7	Apr. 18	May 5	J. H. Applegate.	728 Montgomery
Homiguen Mining Co.	Lower Cal.	7 30	Mar. 7	Apr. 18	May 5	J. H. Applegate.	728 Montgomery
Josephine Quick-Liver M. Co.	Cel.	5	20 Feb. 20	Mar. 31	Apr. 22	G. Sacke.	405 S. on mt.
Kentucky G. M. Co.	New. Co.	1	20 Mar. 17	Apr. 18	May 5	G. Fletcher.	Grass Valley
Keystone No. One and Two G. & S. M. Co.	Cal.	1 25	Mar. 10	Apr. 15	May 5	T. K. Jewell.	507 Montgomery
Keystone No. One and Two G. & S. M. Co.	Cal.	1 25	Mar. 10	Apr. 15	May 5	T. K. Jewell.	507 Montgomery
Lady Franklin G. & S. M. Co.	Cel.	1	50 Feb. 18	Mar. 31	Apr. 21	S. J. Luy.	517 Montgomery
Lady Esen Tunnel and M. Co.	Utah.	2	5 Mar. 17	Apr. 18	May 6	O. S. H. V. 35	New Merchant-Ex
Leon M. & M. Co.	Cal.	1 00	Feb. 12	Mar. 18	Apr. 8	L. M. Small.	608 Gravelly
Leon M. & M. Co.	New. Co. Cal.	1 00	Feb. 12	Mar. 18	Apr. 8	L. M. Small.	608 Gravelly
Mansfield G. M. Co.	Cal.	1 25	Feb. 17	Mar. 25	Apr. 14	Wm. Small.	331 Kearny
National M. Co.	Nye Co. Nev.	25	50 Feb. 20	Mar. 27	Apr. 7	Geo. D. Grav.	34 Market
National M. Co.	Nye Co. Nev.	25	50 Feb. 20	Mar. 27	Apr. 7	Geo. D. Grav.	34 Market
North Beach Con. M. Co.	Ely District.	1	10 Feb. 11	Mar. 15	Apr. 5	Wm. Small.	412 Montgomery
Ohio Con. M. Co.	California.	1	10 Feb. 11	Mar. 15	Apr. 5	Wm. Small.	412 Montgomery
Piermont M. & M. Co.	Cal.	6	50 Jan. 25	Mar. 10	Mar. 31	J. W. Clark.	418 California
Pleche Champion Co.	Ely.	1	10 Mar. 7	Apr. 12	May 3	A. Noel.	419 California
Pleche Champion Co.	Ely District.	1	10 Mar. 7	Apr. 12	May 3	A. Noel.	419 California
Prompet Mining Co.	Grass Valley.	1	25 Feb. 18	Mar. 20	Apr. 4	P. H. Pavnter.	Grass Valley
Project J. Co.	Grass Valley.	2	4 Mar. 21	Apr. 24	May 10	H. H. Payner.	Grass Valley
Sammonson G. M. Co.	Ely District.	3	15 Feb. 14	Mar. 17	Apr. 7	Wm. Signet.	418 California
Sanita Iron Coal M. Co.	Cal.	1	20 Jan. 9	Feb. 15	Mar. 3	L. Knipian.	728 Montgomery
Schuyllkill Quar. & Mining Co. G. Valley.	18	5	Mer. 15	Apr. 19	May 7	W. E. Reed.	Grass Valley
Seaboard S. M. Co.	Nevada.	50	Feb. 6	Mar. 14	Apr. 12	H. H. Martin.	418 California
Seaboard S. M. Co.	Nevada.	50	Feb. 6	Mar. 14	Apr. 12	H. H. Martin.	418 California
Silver Wave M. Co.	Nevada.	10	60 Jan. 29	Mar. 14	Apr. 4	J. W. Clerk.	418 California
South Mountain Smelting Co.	Idaho.	1	30 Feb. 11	Mar. 17	Apr. 17	C. Leonard.	Silver City, I. T.
South Mountain Smelting Co.	Idaho						

Name of Co.	Location.	Secretary.	Office in S. F.	Meeting.	Date.
American Flag.	Ely District.	Col. J. by Trustees.	320 California St.	Special	Mar. 27
American Flag.	Ely District.	H. B. Spioney	320 California st.	Annual.	Mar. 27
Blackhawk M. Co.	Ueb.	H. B. Congdon.	306 Mon gentry St.	Annual.	Apr. 1
Blackhawk C. & S. W. Co.	Nevada.	J. W. Brown.	418 E. Hornum St.	Special	Apr. 2
Columbus M. M. Co.	Nevada.	B. B. Minor	41½ California St.	Special	Mar. 27
Franklin Mining Co.		Wm. H. Watson.	202 Mon g mery st.	Annual.	Mar. 31
Hobbs G. M. Co.	Cal.	A. C. Carpenter.	395 Clay St.	Annual.	Apr. 1
Homiguer M. Co.	Lower Calif.	J. H. Applegate	407 California St.	Annual.	Apr. 7
Imperial C. & C. Co.	Cal.	G. Stansick	30 Sansome street.	Annual.	Apr. 7
Lady Washington M. Co.		W. J. Smith.	41½ California St.	Annual.	Apr. 7
Omega Table Mountain M. Co.		David W. der.	28 Merchants' Ex.	Special	Apr. 8
Phenix Silver Mining Co.	Nevada.	Joseph M. guire.	419 Calif ornia st.	Annual.	Apr. 7
Rising Sun M. & M. Co.		A. Albertson.	302 Montgomery St.	Special	Apr. 2
Tunnel Co.	Nevada.	P. W. Ames.	321 California St.	Annual.	Apr. 3

Name of Co.	Location.	Secretary.	Office in S. F.	Amount.	Payable.
Selober M. Co.	Washee.	H. O. Kibbe.	419 Calif-rnin St.	4 00	Mar. 30
Black Diamond Coal Co.	California.	V. E. Cornwall.	Cr. Harrison & Spear.	3 1/2 per cent	Mer. 10
Cederberg G. M. Co.	California.	D. M. Montgomery.	423 Montgomery St.	1 00	Feb. 6
Con. Amador M. Co.	Cal.	E. Latham.	40 Montgomery St.	1 00	Mar. 4
Crow Point G. & S. Co.	Washee.	C. E. Elliot.	419 California St.	3 00	Mar. 12
Dinna M. Co.		N. G. Fawcett.	220 Clay St.	1 00	Jan. 20
Eastport Coos Bay Coal Co.	Oregon.	J. L. Cool.	Merchants Ex.	1 00	Mar. 10
Eureka G. M. Co.	Grass Valley.	R. Wagner.	414 California St.	2 00	Mar. 7
Labaree G. & S. M. Co.	Idaho.	T. J. Owens.	402 Mont'gry, St.	1 50	Aug. 7
Meadow Valley M. Co.	Ely District.	T. W. Colburn.	409 California St.	1 00	Jan. 15
Monitor-B'umont M. Co.	Nevada.	H. B. Minor.	416 Calif'nia St.	1 00	Mar. 15
Roche S. M. Co.	Ely Dist., Nev.	C. E. Elliot.	Merchants Ex.	1 00	Aug. 10
Verdence G. & S. M. Co.		J. M. Buffington.	Merchants Ex.	1 00	Nov. 11
Raymond & Ely M. Co.	Ely Dist., Nev.	A. J. Moulder.	415 California St.	5 00	Feb. 10

Gould & Curry. Letter of the 24th says they have not reached the quartz with the east drift, on the tenth station. Have run 25 feet during the past week. On the north drift, on this level, have made 17 feet; still in hard blasting rock. Putting down the pumps in the incline. Hope to commence sinking again in about three weeks.

Hale & Norcross.

Weekly report for the week ending on the 22d gives the following summary of operations: Ore extracted during the week, 1,234 tons 1,500 pounds; forwarded to the mill, 863 tons 860 pounds; on hand at the dumps, 1,055 tons 750 pounds. The ore came from the following sections of the mine: Lower mine, first station

Mining stocks have this week been at a discount. There have been few sales, and what have been made were at paucic prices. Leading operators look for a change in this state of affairs very shortly, but they have been expecting it for some time to no purpose. A rich strike on the Comstock would, however, very probably cause a reaction and send prices up again. Last Monday, under the rule of the Board, sales for account were, for the first time, auctioned by the Caller, all persons not members of the Board being allowed to bid as well as members, the buyer to put up 20 per cent. immediately. The public, not being aware of the new arrangement, were not prepared to bid, and only a few sales were made. The increased number of shares being offered, and the stringency of the money market are said to be the causes for this depression in stocks, for the mines are doing as well as they were when stocks were so high last year. Some heavy operators have withdrawn from the market for the present, and that helps to depress it to a considerable extent.

On Saturday they were irregular and weak, most descriptions showing a decline. Chollar-Potosi and Consolidated Virginia each advanced \$3, Belcher, Ophir and Raymond & Ely each \$1. Alpha and Segregated Belcher each declined \$3, Caledonia, Golden Charlotte & Norcross, Mahogany, Overman and Savage each \$1.

Tuesday the decline still kept on with no orders to buy in the market. At close Yellow Jacket and Savage were each \$1 higher; Hermes rose \$3; Raymond & Ely fell \$3; Chollar, \$3.60; Belcher, \$3.50; Cons. Virginia, Uerman and Gold & Curry each fell \$1.

Wednesday there was no improvement in prices or in business either at the morning or afternoon board. Whollar fell \$4; Cons. Virginia, \$2; Hale & Norcross, \$2; Meadow Valley, \$1; Raymond & Ely, \$5; Savage, \$1; Yellow Jacket, \$1.

To-day there were but few changes of interest in stocks. Belcher, Overman, Segregated Belcher and Yellow Jacket were each \$1 higher than yesterday noon. Chollar Estate and Cuban each declined 50 Cents. IF

The following items from prominent mines are taken from letters or dispatches from the respective Superintendents, which are on file in the offices in this city:

American Flag.
Superintendent's letter of the 19th says the main shaft is down below the fifth station 37

Amador Tunnel.
Dispatch dated the 26th reports pulp assays at \$180.

Belcher.
Dispatch of the 26th says the south crosscut does not look quite so well as usual. Stopes look well. Car samples, \$52 per ton.

Chollar-Potosi.
During the week ending on the 22d 387 tons of ore were taken from the main, and 262 tons 100 pounds sent to the mills. Average assay value of ore mined, as determined from car samples, \$40 20. Ore slips 20th and 21st, 124 tons 1950 pounds.

1900 pounds.

Con. Virginia.

Letter of the 23d says that the work of sinking the main shaft is progressing very favorably, its advancement downward being at the rate of 3½ feet per day. Have crosscut the ore vein at a point 55 feet south of the north drift, which shows a width of ore of 28½ feet. The quality of the ore exposed by this crosscut is better than that passed through in the north drift. No ore is being extracted except that taken from the north drift, and no ore has been shipped for reduction.

Crown Point.
Letter of the 22d says they have shipped to the various mills during the month, so far, 10,313 tons 540 lbs of ore; that will, estimating it at 65 per cent of the pure metal, amount to 6,703 tons.

per cent of the assay value, amount in the aggregate to \$653,909.19.

Dispatch of the 24th says they have struck the east wall in the north drift from the main east crosscut on the 1300-foot level. The ore is good clear up to the wall. This drift runs

east of north, following the course of the vein. The 1300-foot level floors are all looking very finely. The incline is down 109 feet in hard blasting ground. There is no change elsewhere in the mine. The amount of hullion received at the San Francisco office for the month up to the 22d was \$402,556 17; received on the 24th, \$63,807 80—making the total for the month, so far, \$466,363 97.

Dispatch of the 26th says there is no material change in the mine since the last report. Put in the new incline rope yesterday, without delaying the mills. The ore breasts look well as usual, and everything in and about the mine

Eureka, Grass Valley.
Letter of the 22d says the clean-up for the last

six days run of ten stamp, was 1,500 ounces of amalgam. The bottom west drift shows a little water, and the ground is a little harder. No change in the east drift. The ledge in the sixth level raise is three feet wide, and the quartz looks well. The ledge in the intermediate drift and stopes looks well. Everything is running well, with no change in any other part of the mine.

level, 8 tons; second station level, 609 tons, 1,500 pounds; ninth station level, 350 tons; tenth station level, 237 tons; twelfth station level, 30 tons. Work at the mine is progressing favorably.

Huhn & Hunt.

Dispatch of the 25th says the ore from the back and front ledges is mixed, and the pulp assay gives from \$39 to \$32 per ton. All ore

east from Pioche, are very encouraging. Machinery is now on the road from Salt Lake for hoisting works and a 20-stamp mill.

The Spectroscope—An Interesting Lecture.

Prof. Neri introduced his third lecture on spectrum analysis by remarking that, as his audience had already, by previous lectures, mastered the principles upon which spectrum analysis is founded, he would now approach

The Method of Its Application.

A fine spectroscope was introduced to the audience, and the principles of its construction and connected appliances were fully explained in detail, and also the successive steps and discoveries by which it has been brought to its present wonderful state of perfection. The analysis of light by the prism as discovered by Newton, 200 years ago, laid the foundation of spectrum analysis. But Newton made his observations by receiving the rays of the sun through a round hole—a method which never would have led to the discovery of the spectroscope. Hence the next important step was not made until 1852, when Wallaston used a *slit* instead of a round hole to receive the rays. The subsequent introduction of the collimating lens, by Mr. Sims, in 1830, by which the rays were properly collected in parallel lines before the observer rendered the spectroscope an instrument of practical value; and finally the introduction of the telescope, as an adjunct, still further perfected it, and rendered possible the magnificent results obtained by Bunsen and Kirchhoff in 1860 and '61. The very latest introduction is the micrometer scale, by which the observer is able to fix accurately the position of the bands of light within even a small fraction of a second of time—as must necessarily be the case in obtaining the spectrum of a flash of lightning. The spectroscope, together with the micrometer, was projected upon the screen by the use of a magic lantern and the electric light, so that it could be readily explained to the entire audience.

Sir Charles Wheatston, in 1835, was the first to distinguish metals by their different colored spectra, and it is considered the greatest triumph of the spectroscope that four new metals—rubidium, caesium, thallium and indium—were discovered by that instrument within the space of four years. Since the spectroscope became of practical value, the progress in science and the arts has made most wonderful progress—an advance largely due to the results of this wonderful instrument.

In order to give a practical demonstration of the use and operation of the spectroscope the lecturer caused various metals to be burned in a voltaic arc, in such a manner as to throw their spectra upon the screen, when the manner in which the various colors of the metals under examination were brought out, was beautifully apparent to every member of the large audience present. It was thus made apparent why all substances examined by the spectroscope must be in a vaporized condition before they can be analyzed by that instrument, that is before the light which they emit can be divided up into its distinct colors so as to fall into their proper places on the spectrum.

When a solid body is simply heated to a luminous point, say to a red heat, so as to give off light, without vaporization, the light is not divided into component colors; but falls upon the screen in what is termed a continuous spectrum—that is, a spectrum made up of all the components of the light exhibited in a combined state, like sun-light when not separated by a prism. In such a condition light cannot be analyzed, and, of course, we can tell but little of the nature of the body so emitting its light.

Hence the spectroscope readily reveals to us whether a luminous body—a star, a comet, a planet, or any highly heated earthly substance—submitted to it is solid or gaseous. Of course a solid body surrounded by a gaseous atmosphere, or giving off volumes of gas would be reported *gaseous*. These are very important facts in connection with the application of spectroscopic examinations of the heavenly bodies. It is an important and well-ascertained fact that no two vaporized substances ever give off lines corresponding in number, color and location on the spectrum. Hence no one substance need ever be taken for another, when submitted to the spectrum.

The Spectroscope Applied to the Industrial Arts.

As illustrative of the manner in which the spectroscope is applied to the industrial arts, a view of a Bessemer steel converter was thrown upon the screen, and the method was explained

how the very instant when cast iron was converted to steel, was distinctly and intelligently shown to the audience. Without the use of this instrument such knowledge could only be (and even then imperfectly) acquired by years of practice and perhaps at the cost of spoiling many tons of iron. Thus it is by the spectroscope only that this, one of the most important inventions of the age has been rendered complete and perfect in its operation.

The Spectroscope Utilized upon Dark Substances.

The lecturer next proceeded to show how the spectroscope could be made useful in detecting adulterations in common articles of food, of wine, etc., to determine the presence of poisons in blood.

This was accomplished by the principle of the *absorption* rather than by the emission or analysis of light. If a small quantity of cheese or butter, or any similar substance was dissolved in some menstruum like ether, and ordinary light passed through it, that light would be more or less absorbed by the substances present, the amount of which absorption may be known, and the agent causing it detected.

The presence of an infinitesimal portion of carbonic acid in blood could thus be detected, although there might not be one-thousandth part of a grain of blood submitted to the test, so delicate and absolutely perfect is the instrument.

One of the most delicate and beautiful experiments was introduced as the closing one, showing that the spectroscope possessed the property of bringing out the phosphorescent properties of bodies. It was possible, for instance, thereby to unerringly detect a false from a genuine diamond—as the genuine diamond is phosphorescent, yet almost imperceptible to ordinary vision, while no imitation, either of paste or quartz, possesses that property.

This was decidedly the most interesting lecture of the series, thus far, and was illustrated by a great number of experiments to which we have not the time to allude at all. The best evidence of the estimation in which it was held is the fact, that so many people could be kept together under the most intense and absorbing interest until past 11 o'clock. The next lecture of the course will be given on Thursday evening, April 3d.

The Age of Steel.

The remarkable progress in the manufacture of steel bids fair to be equalled by the rapid production of cast-steel castings, adapted to many uses where iron is now wholly employed. The first attempt to make a plowshare from the crucibles was a failure. This can no longer be said, for the Pittsburg Steel Works Company, of which J. G. Kittredge & Co., of this city, are agents, are now manufacturing all kinds of heavy cog-wheels, cast true to the pitch-line, showing sharper courses, and said to be in every respect equal to the best iron castings ever made.

When subjected to severe tests from hammers, which would shatter iron wheels of similar dimensions, these were unscathed. At their works they also manufacture light articles, such as six-ounce wrenches, which, when taken from the moulds, are as clean and sharp as malleable iron castings; the number and character of light castings is without limit. They guarantee the pick manufactured by them to stand more service than any thing in the market, and also pay special attention to the manufacture of steel shoes and dies for quartz crushing. From the certificates shown us from several mills where they have been tested on this Coast, they appear to give entire satisfaction. At the low prices at which these castings are furnished, they must be of benefit to the mining interest, for anything which tends to reduce the cost of reduction of ores will be in great demand on this Coast.

When the cost of freight is taken into consideration together with the saving of time in changing shoes and dies, and the length of time the steel ones wear, the difference in them will no doubt be very great. It is claimed that the steel shoes and dies have a greater crushing capacity as they always maintain a full surface.

CAMELS PACKING WOOD.—It is stated that in Virginia City the camels are engaged in packing wood to the Gould & Curry works. Their labors are performed at night, as the authorities forbid their appearance on the streets in the day time, in consequence of the terror their appearance excites among the horses.

The Suto Tunnel of Pioche District—The Pacific.

On the lower foot-hills southeast of Pioche, and a few yards north of the old Ely smelting works, is the mouth of the celebrated Pacific tunnel. Its location is not far above the average level of Dry Valley, which is rimmed on the east and south by the mineral hills it penetrates—it being only high enough above the main basin to insure continuous dumping facilities. The general course of the tunnel is southerly.

The great enterprise was commenced in 1870 by S. R. Nichols and H. C. Church, two miners whose energy and practical judgment are acknowledged by all. The task must have appeared Herculean to these enterprising gentlemen, as they stood on the initial point of the proposed tunnel and viewed before and above them the mighty hill of upheaved quartzite, with its main vein-lines of mineral hundreds of feet away to the east and west. But the developments above proved that deposits worth millions would be tapped by driving right in, and it was resolved that the great enterprise should be undertaken. The mouth of the tunnel was accordingly marked out, 6 ft. 6 inches high and 5 ft. wide, and the work was inaugurated. Day and night the excavation of the solid quartzite was continued, each foot gained in length being several feet gained in vertical depth from the surface, until the 480th foot was attained, and a rich mineral vein exposed 4 feet in width, with regular dip and well-defined walls.

Then the value and practicability of the enterprise were admitted by all, and capitalists at home and abroad stood ready to invest in it. Above and running at right angles with the tunnel were some of the richest veins of Ely Mining District, and all tending downwards in the same general direction, irresistibly leading to the conclusion that at a point below the line of surface disturbance they all emerge into one mighty chamber of argentiferous wealth. A company was incorporated without the slightest difficulty, and it was determined to continue the tunnel right into the heart of Spring Mountain and the center of the great silver deposits which have already swelled the coinage of the world at least ten millions, and the developments of which has scarcely commenced.

So night and day, the great enterprise was pushed ahead until 575 feet more were excavated, making 1,055 feet from the mouth of the tunnel, when a vast body of talcose slate was encountered, interspersed with mineral matter. Progress continued a few feet further through this talc when another rich vein of ore was exposed, being four feet in width and assaying up to the standard of the highest grade ores. At this point it is instrumentally demonstrated that the American Flag Company are extracting their richest ores only fifty feet distant. We turn and retrace our steps half the distance to the mouth of tunnel, where miners are distinctly heard carrying on their developments in the Mariou mine.

The last vein cut, or vein No. 2, goes down almost vertically, and seems to be widening as it descends. The ores are carbonate in character, intermixed extensively with chlorides. But as rich and extensive as this vein is, the company will not be diverted from their original purpose of going into the very heart of Spring Mountain, and far below existing developments, before giving special attention to bullion production. Within the next six months the tunnel will have been driven in at least 1,500 feet, when the greatest veins of the district will have been out by it at points far below the possibility of surface developments reaching for years. Future operations will be watched with deep interest, as they will probably give the world the first practical demonstration of the permanency of our mines. The tunnel will be extended beyond the Huhn & Hunt mines—the highest developments on Spring Mountain—before the management will think of suspending operations. It will soon cross the Standard, Bowery, American Flag and Sunbeam ledges, but beyond the lines of their locations, so there will be no probability of ensuing litigation.

The work on the Pacific Tunnel is being done in the most workmanlike and substantial manner, strongly and durably timbered wherever needed, and it will stand for generations a monument of the energy and bold enterprise of its projectors; and we feel safe in saying that the time is not distant when millions of dollars worth of rich ores will pass through it. It would be valuable property without the rich mines intersected by it, as three or four of our leading mines could reach it by cross drifts, and at comparatively trifling cost.

This great enterprise may properly be termed the Suto tunnel of Lincoln county. — *Pioche Record.*

ARIZONA COLONY.—The *Paria American Register* says that some American and French contractors and bankers in Paris have procured land in Arizona, where they intend to establish a French colony and also to construct a rail road from the port of Guaymas, on the Gulf of California, to Fort Mohave, in Arizona.

WORK AT VIRGINIA CITY.—There are many miners and mill hands out of work in Virginia City at the present time. One foreman says it is "with the men as with fleas—when one gets a place it brings forty more." The horse disease has had much to do with this state of affairs.

Utah Mining Matters.

We glean the following item from an article on the "Resources of Utah" in the Salt Lake Tribune:

General Review and Future Prospects.

The coming season appears to be unusually bright for the Territory from a business point of view, indeed the outlook was never so bright as now, and it is safe to predict that the present dull state of business affairs will be followed by a reaction that will gladden the hearts of many who are now despondent.

In mining matters the prospects surpass those of any past season, and developments in every district proving the existence of most valuable mines, while English, Foreign and Eastern capital is better disposed toward Utah than formerly, and the probabilities are that, early in the season, capitalists will not be slow to invest in mining property offering good inducements.

Railroad building this season has assumed gigantic proportions, hundreds of miles of narrow-gauge roads being in contemplation with every prospect that work will be pushed with extraordinary vigor. Necessity for rapid communication with all parts of the Territory is apparent to every one conversant with our resources and their rapid development. The early completion of a road to Pioche is imperatively demanded in the interests of our merchants, while several short roads to the various mining camps are scarcely less necessary. Not only will our own roads vitalize the Territory with the money expended in their construction, but those now contemplated in southeastern Nevada—the road from Pioche to the Colorado, and others centering here—will also exercise an important influence on the growth and prosperity of Utah. In this connection we again call attention to the great iron and coal interests in the south, and hope that the manufacture of iron on a large scale and shipment of coal to points in the West will be accomplished during the year.

The erection of quartz mills and smelting works in various parts of the Territory will undoubtedly make available large amounts of ore now awaiting treatment at points from whence it will not pay to ship in a crude state, and will otherwise do much towards creating new points for business.

Capital and Capitalists Coming.

Reports from England are more favorable than lately in relation to American mines, and confidence in their being paying investments seems to be gaining ground rapidly.

The Hollanders have, through agents here, been investigating our mines, and are showing their appreciation by making purchases of mining property. An agent of parties in Frankfurt recently left the Territory for his home, and assured us that he was perfectly satisfied with the result of his investigations, and that he should advise his friends to invest their capital in such valuable property.

We also learn from reliable sources that some wealthy men from Michigan design erecting extensive smelting works on a large scale, and at a heavy expense, near the south end of Great Salt Lake.

We understand the intention is to reduce the ores from the Utah Queen, Converse and Miami mines. Much as Michigan has been interested in Utah mines during the past year, it is expected that the Peninsular State will invest much more in this Territory during the coming season.

The attention of men of influence and capital in St. Louis, Missouri and Cincinnati, and Cleveland, Ohio, has of late been drawn to a consideration of the benefits to be derived from the investment of their money in our mining and manufacturing interests.

Discovery of Gypsum.

A large bed of this valuable material has recently been found about 100 miles west of Cheyenne. The specimen exhibited by the discoverer, Mr. Charles Amee, is of very fine quality and indicates a high commercial value attached to the discovery.

Hematite Ore.

The Rocky Mountain Vermillion Paint Works of Rawlins, Wyoming Territory, are supplying hematite ore for fluxes at a much lower rate than the article has heretofore been offered to our smelters. The price is only three dollars per ton on board of the cars at Rawlins.

New Coal Mines.

Coal has been discovered in Spanish Fork cañon, eighteen miles from the settlement. The specimens taken out are excellent. The extent of the deposit has not yet been ascertained, but those at work upon it are of the opinion that a large body of coal will soon be reached.

A report is also current that coal has been discovered in Box Elder cañon by persons living in Brigham City, but the report requires confirmation.

The Production of Lead.

No feature in the future of this Territory presents itself to our minds charged with such lasting benefits in a commercial point of view as the utilization of our argentiferous resources; for their development will form a source of wealth, at some future day, the value of which cannot be over estimated. The manufacture of pig, sheet, bar, shot and white lead will, we predict, be not only one of the leading branches of industry, but rank among the chief exports of this Territory.

USEFUL INFORMATION.

VALUE OF SWEEPINGS.—It is stated that one of the jewelry manufacturers in Newark, N. J., recently put down a flooring in their workshop, and that the gold they obtained in burning the old flooring not only paid for the new one but for putting two coats of paint on the entire factory. In another the hands all work on a sort of bracket standing out from the bench in front of them, so that the filings of gold may fall on a tin plate below, and be returned to the melting-room. The greatest care is exercised to prevent waste. The floors, benches and seats are carefully swept every evening, and the sweepings put away to have the gold removed from them by chemical process. Every now and then aprons, benches, stools, and even the flooring, are burnt up to get the gold out of them. Even brushes, clothes, cotton, wool and rags are burned. The average quantity of gold saved annually in this way in this factory is about \$50,000 worth. All the water in which the 500 employees wash their hands is carefully filtered four times, and the amount of gold recovered from it averages about \$15,000 a year. A barrel of sweepings will fetch \$4.50 a pound; and even after they have, as they think, extracted all the gold from them, they sell the refuse to the smelters at nine cents, and even as high as eleven cents a pound.

GREEN VARNISH.—There is a most beautiful transparent green varnish employed to give a fine glittering color to gilt or other decorated works. As the preparation of this varnish is very little known, an account of it may in all probability prove of interest to many of our readers. The process is as follows: Grind a small quantity of a peculiar pigment, called "Chinese blue," along with about double the quantity of finely powdered chromate of potash, and a sufficient quantity of copal varnish thinned with turpentine. The mixture requires the most elaborate grinding or incorporating of its ingredients, otherwise it will not be transparent, and therefore useless for the purpose for which it is intended. The "tone" of color may be varied by an alteration in the proportion of the ingredient: a preponderance of chromate of potash causes a yellowish shade in the green, as might have been expected, and *vice versa* with the blue under the same circumstances. This colored varnish will produce a very striking effect to japanned goods, paper hangings, etc., and can be made at a very cheap rate.—*Cabinet Maker.*

TO PRESERVE BOOKS.—It is not, perhaps, so generally known as it deserves to be, that a few drops of any kind of perfumed oil will secure books and manuscripts from the deteriorating effects of mold and damp. The species of leather so extensively used by book-binders owes its powers of withstanding the effects of these destructive agents, to the tur of the birch tree—*Betula alba*. The preserving of books, written on papyrus and parchment, by means of perfumed oils, was known to the ancients. The Romans made use, for this purpose, of the oil of cedar; hence, undoubtedly, the expression of Horace, "*digna cedra*," meaning any work deserving of being anointed with this oil.

POPULAR FALLACIES.—One of the most singular things is the tenacity with which popular fallacies cling to existence. Thus almost every man you meet believes that hairs are tubes, although this has been disproved over and over again by taking a hair and examining a cross section under the microscope. So too, most persons believe that every drop of water is filled with animalcules, while the truth is, that microscopists find it difficult to get specimens of water that contain enough for examination. It is true that some of the water supplied to our large cities will exhibit an abundance of animal life without the use of the microscope, but good well-water contains very few animalcules.

VARIETY IN COLORS.—New tints of the various colors are constantly being discovered. Over 2,000 established shades have already been produced for the dyer's art, and the number is constantly increasing. Among the forty or more shades of blue, scarlet, crimson and yellow, there are hues which were wholly unknown a few years ago, and for which it has been necessary to coin an arbitrary name, as they resemble nothing previously known. Every little while the popular fancy demands a new variation, and colors must be mixed and blended until something entirely novel is produced. It may be pretty or otherwise—that is regarded of comparatively little importance, provided it is the style.

ELASTICITY OF SPONGE.—Ordinary sponge out into small pieces and submitted to certain chemical processes, acquires such remarkable elastic property, that a weight weighing but one pound, compressed into a space of three inches in thickness by six in length and four in width, when cut apart, will expand to over two feet in length.

COLD AS A FOOD PRESERVER.—M. Boussingault recently mentioned the fact that a number of samples of soup, meats, etc., which had been kept since 1865 in closed vessels at a temperature of 20°, retained all of their original qualities. The author also mentioned that the fact was true of the juice of the sugar cane kept in a similar manner.

A SUBSTITUTE FOR IVORY.—An exchange says that a manufactory has been started in Newton, New Jersey, for making an article out of gum camphor and other materials, which is destined eventually to supersede the use of ivory. By this process the coming substitute for ivory can be heated and moulded into any shape or form desired. A practical substitute for ivory has long been an important desideratum.

A HUNDRED YEARS AGO.—The first stage coach from New York to Boston started on the 24th of June, 1772, from the "Fresh Water." It was to leave each terminus once a fortnight. The fare was four pence, New York currency, per mile. It reached Hartford, Conn., in two days, and Boston in two more. The proprietors promised a weekly stage "If encouraged in their great enterprise."

SINGULAR CHEMICAL TRANSFORMATION.—A sheet of ordinary white blotting paper which will tear by its own weight when wetted, is converted into a material having all the properties of a tough parchment by merely dipping it for a few seconds into sulphuric acid. The Germans are using this artificial parchment for sausage skins. It need hardly be said that it is highly indigestible.

STOPPING RUNAWAY HORSES.—Among the patented contrivances for stopping runaway horses, one consists of a pair of nose stoppers, attached to a bit, which are closed over the nostrils of the animal by means of a cord, which the driver pulls if the horse attempts to run. Another consists of a pair of blinders, by which the driver, on pulling a cord, instantly blindfolds the animal.

NOVEL MODE OF MEASURING THE HEIGHT OF TREES.—The Canadian way of measuring a tree is said to be as certain as it is grotesque. You walk from the tree, looking at it from time to time between your knees. When you are able to see the top of a tree in this way your distance from the root of the tree equals its height.

CHINESE LABOR.—Employing cheap Chinese labor is not always the best thing in the world for the interests of the manufacturers. In many cases no sooner do they learn the art of making the things, principally hoots and shoes, and cigars, so far, than they turn and set up for themselves, selling at much lower rates.

A FORTUNE FROM LAMP CHIMNEYS.—A glass blower of Pittsburgh, Pa., was the original inventor of lamp chimneys, and has realized over half a million of dollars from his invention.

FROM JOPPA TO JERUSALEM BY RAIL.—Cars now run from Joppa to Jerusalem in two hours.

GOOD HEALTH.

Sanitary Conditions.

Dr. T. M. Logan, of Sacramento, delivered a lecture before the Polytechnic class last week on the subject of California Meteorology and Sanitary Condition. Dr. Logan commenced his remarks by explaining that he did not lecture last week, as announced, because of a misunderstanding—the committee failing to notify him of the change of programme.

The carefully prepared lecture was mainly devoted to hygiene, and addressed more to unprofessional than professional ears. The lecturer adverted upon the uniformity of animated nature in the primeval ages, and the failure of such uniformity with the present occupants of the various countries of the globe. The study of ancient history and literature, he was inclined to think, was too much neglected.

Laws of Health Governing the Ancients.

In the most ancient ages laws of health were associated with the laws of government. These laws date from before the time of Moses, which is proved by temples devoted to hygiene. In Greece, sanitary laws were most carefully observed. By wholesome sanitary laws Sparta created an iron race of men, but more for warlike purposes than social happiness. In Athens symmetry of form was more thought of than robustness. Rome carried sanitary laws to a greater perfection than had before been known, and the proof of their success was the superior power of the Roman legions. The collections obtained from ruins show that the rules of health were very radical. From the decline of Rome less attention was paid to these laws, and the result was a rapid accumulation of all diseases affecting the human race. Enlightenment has increased the average of human life from twenty to forty years. In Turkey the laws requiring ablution are worthy of higher civilization. Since the destruction of Rome by Northern barbarians, and the people became slaves of a priesthood, the broad domains have become sickly marshes, and the people no longer obey the laws of health. Unless something is done, history will repeat itself, and the same fate will befall the fair lands of our Southern States.

Ravages of the Plague.

The lecturer quoted historical accounts of great plagues which had swept over Europe. In the fourteenth century the black death carried off one-quarter of the population of Europe. This fatal disease had its origin in

Egypt. In 1399 the plague broke out in Italy for the sixteenth time. In 1485 Lazarettos were established in Europe, in which strangers were confined for forty days, hence the term quarantine.

Beneficial Progress.

Since that time there has been gradual progression to ameliorate the human race from disease. But at present water supply is as little thought of as was formerly ventilation. It is well-known that vaccination will wholly remove the danger of small-pox, but people neglect this precaution from prejudice. California has taken a decided step in the right direction by the formation of a State Board of Health to advise upon general sanitary rules that shall be uniformly applied to all towns of the State. In conclusion, the lecturer urged that we use energy, trace out the true laws of health and apply the practical knowledge of the Athenians, if we would have strong and vigorous constitutions and enjoy a healthful, long life.

Good Food and Good Health.

Upon this topic Professor Blot thus expresses himself: "The man who does not use his brain to select and prepare his food is not above the hordes that take it in the raw state. It is to the physique what education is to the mind, coarse or refined. Good and well prepared food beautifies the physique the same as a good and well directed education beautifies the mind. People's taste is in food as in dress, differing not only in colors, but also in shape, therefore by our variety of dishes and our different styles of decorating them, by the ease that they can be prepared in the cheapest as well as in the most costly way, we think we meet all wants and tastes. In fact, to use a very trite remark, 'you cannot make a gentleman by feeding him on codfish.' There is no country where there is so much dyspepsia as in America, because our people pay but little attention to food and eat too much meat for the exercise they take. If one has mental labor, fish every second day, at least is requisite. Soup sets all the glands at work, and prepares the stomach for the most important function of digestion, and therefore should be taken at dinner every day. Beef broth is to old age what milk is to the young. Cookery properly attended to keeps man in health, if the stomach is out of order the brain is affected. We have the soft and hard parts in our anatomy, and the bile, and therefore it is requisite to vary our food. We should eat more fruits, vegetables, soup and fish. Fish and cheese are the best articles of diet to give to children. United States has the most money of any people, and the greatest abundance of raw material, yet they live more poorly comparatively than any civilized nation. For instance there is a millionaire in Brooklyn who has pork and beans every second day for dinner. Wrinkles are produced by the want of a variety of food."

LIGHT CLOTHING.—In clothing the human body this principle should be kept constantly in view, viz: Let the clothing be as light as possible consistent with comfort. Every pound of clothing beyond this constitutes a useless and constant burden. Besides this, it presses upon and interferes with the action of the skin. Adherence to this principle also implies an equal distribution of clothing over the entire body.

DANGEROUS HOLLOW WARE ENAMEL.—A Prussian physician has examined the enamel on hollow-ware sold in Berlin, and reports that the enamel on a stew-pan made in Belgium contained so much lead that $2\frac{1}{4}$ grains of oxide of lead was found dissolved in one litre of vinegar (3 per cent acetic acid) which had been hoiled in it for one hour.

Hall's Journal of Health says: "The old and young delight in warmth; it is to them the greatest luxury. Half the diseases of humanity would be swept from existence if the human body were kept comfortably warm all the time."

A GOOD LINIMENT.—One of the very best liniments that was ever made for man or beast, is composed of equal parts of laudanum, alcohol and oil of worm wood.

KILLING KNOTS.—Glue size and red lead gum shellac dissolved in alcohol, and mixed with red lead gutta percha dissolved in ether. But through all or any of these will the pitch of the knot exude if exposed to the sun? Perhaps the very best method is, to size the knot with oil size, and then lay a leaf of gold or silver on it. In a very choice piece of work, a hot iron may be held over the knot till a good portion of the pitch has come out and been scraped off, when the two coats of the leaf will be sure to keep out both the pitch and any discoloration.

THE MOON'S ATMOSPHERE.—If the atmosphere of the moon really exists, its density is less than the 2,000th part of the density of the earth's atmosphere. Such an atmosphere would be more attenuated than the vacuum which is obtained, under the best conditions, in the most perfect air-pumps. The refraction, or rather non-refraction of stars, is the means by which this determination is obtained.

MISCELLANEOUS.

Onions.

Onions can be used in many ways, though they do not range high in nutritious qualities. The odoriferous are altogether too high until well cooked. Like cabbage, they are almost indispensable to meat and vegetable soups. They are good also for stews. A delicious little stew, into which I was led by the favor shown to "Mallium," can be made of about equal parts onion, potato, and apple. Peel and quarter three onions, and put them to stew in double their measure of water for forty-five minutes, (for red or yellow onions one hour). Then cut up and add three medium-sized potatoes, and three apples, pared, quartered, and cored. Then, upon one gill of wheat meal, pour boiling water enough to scald it, stirring it lightly; and when the stew boils up, after putting in the potatoes and apples, add this dough, in bits as big as an almond, and not compact. Cover close and dish the stew; and if the liquid is too thin, add a little wheat meal: salt and pour over the stew and serve warm. Rutabagas and parsnips can be used instead of the apples, but they require more time to cook, and are not so delicate. If meat is wanted in these stews, use the lean of mutton, not lamb nor veal.

Perhaps a word of caution is necessary at this time of the year about young meat. It contains very little nutrition (probably because, not fully formed), and that little does not seem to be well adapted to our wants. In many cases, the effects of eating it have seemed little short of poisonous. It is the best economy to kill the calves at once, if there are any to be disposed of, or keep them until they are at least a year old.—*Science of Health*

RYE FLOUR BREAD.—Take as much flour as you wish for one baking of bread; make a hole in the centre of the flour and stir into it one teaspoon of good hop yeast and one pint of new milk. Stir the batter a little stiffer than for griddle cakes. Then cover closely and let it rise over night. In the morning add more new milk, and knead up your bread very stiff. Then with your fist make a hole through the centre of the dough, and let it raise until it is even on the top. Your bread is then ready to put in the pans for the third raising, which will take about half an hour. Bake as you would wheat bread. Salt it if you like. I have made most excellent bread in this way. It is also good to mix two-thirds wheat flour to one of rye.—*W. Rural.*

CALF'S HEAD PIE.—Boil a small calf's head or half a large one, take all the meat from the bones, blanch and keep the brains separately, skin the palate, tongue, etc., and cut the latter into thin slices. Season with spices according to taste. Shape the meat for a few moments in a hot pan over a brisk fire. Put a rim or crust around your dish, lay in the meat, filling up with the yolk of eggs hard-boiled, pieces of the brains, forcemeat balls, and a little minced anchovy. Finish with a cupful of good gravy, and cover with a crust. A few flat sausages may take the place of the forcemeat balls, but they must be very highly seasoned, or the pie will be insipid. Oysters are likewise admissible.—*Ohio Journal.*

PICKLED LEMONS.—Take small lemons with thick rinds, and rub them with a piece of flannel; then slice them half down in four quarters, but not through to the pulp; fill the slit with salt pressed hard in; set them upright in a pan for four or five days, until the salt melts; turn them thrice a day in their own liquor until tender. Make enough pickle to cover them of good vinegar, the brine of the lemons, Jamaica pepper and ginger; boil and skim it; and when cold put it to the lemons with two ounces of mustard seed, and two cloves or garlic to every six lemons. When the lemons are used, the pickle will be useful in fish and other sauces.

CORN-MEAL BREAD.—Pour over a pint of nice corn meal one pint of hot new milk; beat this well and add a little salt; then stir in a large spoonful of nice, sweet lard; beat two eggs very light and stir in also; this must be well beaten, and of the consistency of thin batter; add more milk if it should be too thick; then mix in a large spoonful of yeast; batter the pans and set it to rise in them; when risen, have the oven of a moderate heat, and put them in it; bake two hours and a half to a light brown. Serve hot.

HOW TO PREPARE TURNIPS FOR DINNER.—Take of good turnips and potatoes enough to make two quarts of each, after being peeled and cut. Two or three pounds of fresh beef or pork, of medium fatness, should be hoiled for an hour, to which the turnips and potatoes are to be added; boil the whole half an hour longer, then add half a teaspoon of both sugar and flour, and hoil five minutes longer. When done, they ought to be mashed the same as usual.

CREAMEN POTATOES.—Have ready some potatoes hoiled or steamed, and cut into slices; place them in a stewpan with a coffee-cupful of good thick cream, a desert spoonful of flour, some salt and crushed pepper, grated nutmeg, chopped parsley, and minced onions. Mix thoroughly, put upon the fire until scalding hot, but not hoiling, and serve quickly.



B. EWER.....SENIOR EDITOR

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San Francisco:

Saturday Morning, March 29, 1873.

Legal Tender Rates.—S. F., Thurs., Mar. 27.—buying 87½; selling 87½.

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SPANISH PROGRESS.—The new Republic of Spain has taken a wise step and abolished slavery in the Island of Porto Rico. The number of slaves set free is about 50,000. It is to be hoped that the Spanish Cortes will now take into consideration the abolition of slavery in Cuba, and emancipate its 360,000 slaves. The latter subject has been under discussion.

UP THE NILE BY STEAM.—This is the title of a little volume of 75 pages by R. Etzenberger, full of valuable and interesting information to persons making the tour of Egypt, and particularly the trip from lower to upper Egypt by steamer on the Nile. No traveler to that land of wonders and ancient civilization should be without it. For sale by Thomas Cook & Son, London.

A PECULIAR FISH.—A remarkable fish from Humboldt Bay is now on exhibition in this city. It is 3½ feet long with a slender eel-like body and a large head with a mouth like a crocodile's. The teeth are sharp and transparent, sloping backward from the jaws. Immediately back of the head commences a large winglike fin, about six inches high when erect, which runs the length of the back. The fish was found dead on the beach, and is preserved in alcohol.

AGASSIZ'S MUSEUM.—The Committee of Education in the Senate has reported a resolution appropriating \$50,000 for Professor Agassiz's Museum at Cambridge, Mass.

BORATE DEPOSIT.—An extensive borate deposit has been discovered about 120 miles from Los Angeles on the Owens River Road, in Kern county. Other deposits are reported 60 miles distant from Los Angeles in the State range, North of Desert Springs. The place are being thoroughly prospected.

Danger from Falling Meteors.

Information has been conveyed to the British Royal Society, and published in the last number of their "Proceedings" to the effect that during the appearance of the meteoric display on the night of the 13th of November last, the night watch upon a light ship, stationed off the north coast of the Sicily Islands, was struck senseless by a meteor, and that the decks of the ship were covered with fine cinders, supposed to have been derived from the falling dust of consumed meteors. The watchman appears to have been struck down at the very commencement of the meteoric shower, but after his return to consciousness he saw "balls of fire like large stars, falling into the water like splendid fire-works," and accompanied with a strong smell of brimstone. The brimstone smell was no doubt due to the abundant production of ozone in the atmosphere by the rapidly moving and glowing bodies of the meteorites.

It is fortunate for mankind that meteoric bodies for the most part are so small that they are almost instantly dissipated on coming into our atmosphere, by the great friction and intense heat generated by their rapid motion through the same. The motion of a meteor through space, is many times more rapid than that of a cannon ball, during the first second of its discharge. Indeed, even a twenty or fifty pound ball, if projected with a force which would give it the speed of a meteor, would be dissipated before it could reach the distance due to its initial discharge.

Oxidizable bodies, under such circumstances (and all meteors as well as cannon balls are extremely oxidizable) are not converted into gases, but undergo a rapid oxidation or burning-up process, by reason of the large amount of oxygen with which they come in contact during their rapid flight; disappearing just as a piece of steel "burns up" when heated and tipped with a little brimstone, and plunged into an atmosphere of pure oxygen; as is often seen in lecture experiments. Perhaps a better illustration is the frequent practice at the camp-fire, when it burns low, of picking up two or three almost expiring brands, holding them close together and whirling them rapidly around until they burst into a flame, and therewith renewing the camp-fire.

Were it possible for any considerable portion of the great number of meteors which flame through the sky, especially at the time of their periodical display, to reach the earth, in their flight, much danger might be apprehended to life and limb.

A bombardment of cannon balls from an aerial fort (with their comparatively slow motion) and equal in frequency to the appearance of meteors in our August and November showers, and sweeping as those displays do, completely around the earth—the earth rather plunging directly into the midst of the meteoric orbit—would be a calamity dreadful to contemplate, and the frequent occurrence of which might almost depopulate our planet.

It is only now and then, however, that we encounter meteors of dangerous dimensions. In fact, their infrequency is considered a matter of serious inconvenience to scientists, who would like to meet with them much oftener, to the end that they may the more readily fill up their cabinets with specimens of these aerial wanderers.

LOCOMOTIVES.—California has a great many narrow-gauge railroads projected and a few in course of construction, for which rolling stock will of course be needed. The style of locomotives to be used is an important consideration, as the successful operation of a few roads in this State will eventually cause others to be built. The National Locomotive Works of Dawson and Bailey, at Connelville, Pa., whose card will be found in another column, are manufacturing a very superior class of locomotives, and give special attention to those intended for narrow-gauge roads. They have built a number of engines for roads in the Southern States, Utah, Nevada and South America, and for coal roads in Ohio, Pennsylvania and other States, all of which are said to be giving satisfaction. Their mining locomotives are extensively used in the coal mines of Western Pennsylvania. Parties interested in narrow gauge railroads and mining operations, who desire to do so, can examine drawings and ascertain particulars at the office of Capt. H. A. Gorley, No. 521 Front street, that gentleman being agent for the above firm.

America at the Vienna Exposition.

It is gratifying to learn that notwithstanding the small amount of the appropriation by Congress, and the drawbacks occasioned by the patent laws of Austria, that American manufacturers will be creditably represented at the Vienna Exposition. It is now stated that there will be upwards of 550 more exhibitors than there were at the Paris Exposition of 1867. The display of American Agricultural implements—a very important one—will of itself occupy a space of about 15,000 square feet, and will comprise the work of 25 different manufactures. The machine in motion will occupy a space of 15,000 feet and will be contributed by 150 firms. The specimens, which include almost every machine capable of being propelled by steam power, will be run by four American engines. In this particular an improvement is made upon the Paris Exposition, where our machinery was run by foreign steam power. The department of "machinery not in motion" will represent 150 manufacturers, and occupy a space of 15,000 feet. The Northern Pacific Railroad Co. have contributed a large number of specimens of agricultural, mineral and other productions of the "New Northwest." A collection of maps, volumes of statistics, photographs, etc., has been sent by the American Geographical Society. There will be a collection of over 7,000 American daily, weekly and monthly periodicals.

The department of minerals, ores, etc., is reported to be very full and includes minerals and ores from all the principal States of the Union, including silver and gold quartz from this State, and specimens of coal from all the leading mines of the nation, accompanied by comprehensive maps showing the territory covered by the respective specimens. Unfortunately the lack of interest shown in this Exposition here in California, and in fact on all of the Pacific Coast, has prevented an appropriate collection being made. As exhibitors had to pay the expenses of transportation from here to New York they were unwilling to take the trouble and risk of sending anything very valuable. We are certain that the mineral products of this Coast, the most important and varied in the United States, will be slimly represented, but the coal and iron interests of the Eastern States will nevertheless make a good show. Several gentlemen who went to Vienna from this Coast endeavored personally to collect specimens enough to represent us fairly but hardly succeeded. They had not the time to spare to visit the many different mines, and as few people took the trouble to send specimens the collection will be comparatively meagre. Messrs. Booth & Co., of the Union Iron Works, in this city, intended to have forwarded a complete 10-stamp California mill, with all the usual appliances, which would probably have been the best characteristic California representation at the Exhibition. Mr. Guido Kustel, well known to our mining community, was to superintend its operation at Vienna. A special exhibition was intended, and a sum of money was to be raised to defray expenses. The mill was to be the share contributed by Messrs. Booth & Co. Unfortunately the others failed to raise the necessary funds, and the project fell through, so the mill did not go. Professor Blake has been appointed Commissioner to the Exhibition and we will no doubt have some very interesting and exhaustive reports in relation to the mining industry which is represented.

The sugar and cotton interests of the South will be well represented, and rice, ramie, tobacco, etc., etc., will be shown in all the various stages of its growth and manufacture. Among the features likely to attract general notice will be machines for the manufacture in the presence of visitors of palls and shoes, spinning, knitting, sewing-cloth, cutting and even a writing machine. There will be a full representation of printing presses and two daily papers will be printed under the auspices of the American Commissioners. Musical instruments will be shown in profusion. American Art will be, however, but slimly represented. A model school-house, with furniture and text-books complete, has been sent. The exhibitors who sent articles to this Fair number 300 in all. After all that has been said against Americans showing their goods at Vienna, it is satisfactory to know that such a respectable representation will be made. An International Patent Rights Congress, composed of manufacturers, scientific men and experts, will be held at Vienna during the Exhibition.

THE OHIO STRIKE.—A dispatch from Youngtown, O., dated the 24th, says that on the arrival of an armed force from town, Friday night, at the Mahoning Coal Company's mines, the rioters who were there in large force, and had commenced hostile demonstrations, dispersed, and the immigrants employed to take their places, went into the mines unmolested. On Saturday morning, the strikers again attempted to intimidate them, but were unsuccessful, the guards preventing a collision. The breach between the strikers and coal operators is growing wider, and to put an end to the strike, the operators intend to import 1,000 or 2,000 immigrants. This is a new way of getting out of the difficulty surely.

San Francisco Directory for 1873.

Langley's San Francisco Directory for 1873 was issued some ten days since, and presents a formidable volume of 884 pages, besides some 200 pages of advertisements. The regular annual increase in the volume of this valuable compilation, affords an excellent index of the rapid growth of San Francisco. Every succeeding volume also brings fresh and interesting facts for the study and consideration of our people. The compiler, in the present issue, opens his prefatory remarks with the following encouraging statement:

At no previous period of the city's history could there have been presented a more favorable record of a twelve-months' progress than the one contained in the present volume. In almost every department will be found abundant indications of a growing and healthy improvement, and when the facts and figures contained therein are carefully considered, no better evidences need be required to substantiate the present prosperous condition of this city, or to predict for its future, a prominent position among the leading commercial cities of the world.

The General Register contains 69,403 names. The number of references contained in the present volume is 100,903. The population of the city is estimated at 188,323, a gain since March, 1872, of 10,047, or over five and one half per cent. The number of buildings erected during the year ending February 28, 1873, is about 600, at an estimated cost of \$3,750,000. Total number of buildings in the city is 20,887.

The increase of population, for the year has not, for various well known reasons, been quite up to the previous ratio; yet basing the increase for the next ten years upon the ratio of the year just passed, San Francisco will have a population in 1883 of very nearly 300,000! We can hardly suppose that the suburban drain can bear any greater proportion to our population, at any time during the next ten years, than it has done for the year past, nor that railroad uncertainties or any other ordinary drawback to our natural increase can be in excess of what we have experienced during the past twelve months. Hence we infer that the figures above assumed will be fully realized in 1883.

The volume before us, which is the 14th of the series, contains a vast amount of valuable and interesting statistical information connected with the municipal organization, our public schools, banking institutions, insurance companies, religious and charitable institutions, general industries, etc. The book has evidently been prepared with great care; the arrangement of the matter is well made and all the details evince skill, care and patient industry. The Directory is a credit not only to its compiler, but to the city itself. It is from the press of Valentine & Co.

A New Canteen.

Richard Kelly, of Red Bank, Tehama Co., in this State, has recently procured through the SCIENTIFIC PRESS Patent Agency, letters patent for an improved Canteen or water-carrier. Mr. Kelly proposes to make the canteen out of canvas or other thick and almost waterproof cloth, which will keep constantly saturated with the contained water, so that the evaporation from the outside of the canteen will keep the water inside cool and refreshing as long as any remains in the canteen. He also attaches to the canteen a filtering sack through which the water is passed in filling the canteen, thus enabling the traveler to use water which would be otherwise unfit for drinking purposes. This invention will be appreciated by all who know the value of a pure and cool drink of water in the hot and sultry days of summer, especially in those neighborhoods where water is scarce, and what little there is is unfit to drink. Mr. Kelly proposes to immediately manufacture a quantity of his canteens for general use, so that farmers can apply themselves with them for use in the coming harvest.

THE DIAMOND SWINDLE.—The telegraph announces that on Monday the civil suit of William M. Lent against Phillip Arnold and Robert Slack, for \$350,000, was dismissed in the United States District Court at Louisville, Kentucky, by consent of the parties. Arnold having compromised with Lent by paying him \$150,000 in greenbacks and each party to pay their own costs.

THE SHIPMENTS OF COOS BAY COAL TO SAN FRANCISCO during January and February this year, amounted to 6,059 tons. This will be largely increased in March and April.

Suplee Needles—Their Manufacture in San Francisco.

The Suplee needle is a recent California invention and one which is destined to do away entirely with the old-fashioned sewing machine needles so long in use. It differs from all other sewing machine needles by having an open eye or slit so arranged that it can be threaded instantly by taking the thread in both hands as shown in the accompanying cut, placing it at the eye, and pulling it gently against the needle with a downward motion. This dispenses at once with the slow process of biting off the thread and twisting the end into a point so as to get it through the ordinary eye. The saving of time alone is an item in its favor, without taking into consideration the trouble incident to threading old-fashioned needles. The manufacture of sewing machine needles in the United States has heretofore been confined almost exclusively to North Bridgewater, Mass., but a factory for turning out needles of this patent is now under way in this city, owned by the Suplee Needle Company.

We recently paid a visit to this factory, which is located at the corner of Sansome and Sacramento streets, and found the process of manufacture very interesting. The tools used are delicately constructed and highly finished, the majority of them having been made in this city. The needles are made from the best English steel wire. The wire is first straightened and a machine then cuts it to the proper size, by means of a minute circular saw, and performs the blank shaping of the wire for the stamping machine which makes the shank. The shank is made in the same manner that paper is stamped. The shank is then grooved by an instrument which has two small circular saws close together, between which the shank is placed and the two grooves, one on each side, but one larger than the other, are cut at the same time. One operator can work two of these machines, a great improvement over the old way when only one groove could be cut at a time. The neatest little machine in the shop is the drill which is a marvel of nicety, running at about 2,500 revolutions per minute. This drills the eye of the needle, this part of the process differing from that in vogue in Europe where the eyes are punched. The foreman, Mr. A. B. Holmes, informed us, however, that the drill makes a much smoother eye than the punch, performing the work more thoroughly. The eye, which is after drilling only round, has to be reamed out to be made oblong. This is done by a small tool placed in a turning lathe. To produce the slit in the eye which is the important feature in the Suplee needle, the half-formed needle is then placed in a clamp and the slits cut with a fine circular saw. It is then cleaned by revolving metallic and ordinary brushes. The needles are curved to conform to the style of the machine upon which they are to be used, as different curvatures are necessary on machines of different patents. This operation is performed on a machine which has the *fac simile* curvature of the needle of the machine for which it is intended. The needle is then tempered, which operation is performed in another room. A number of needles are heated to the proper temperature in a small furnace and then placed in cold whale oil after which they are placed in a pot and again heated to a certain degree.

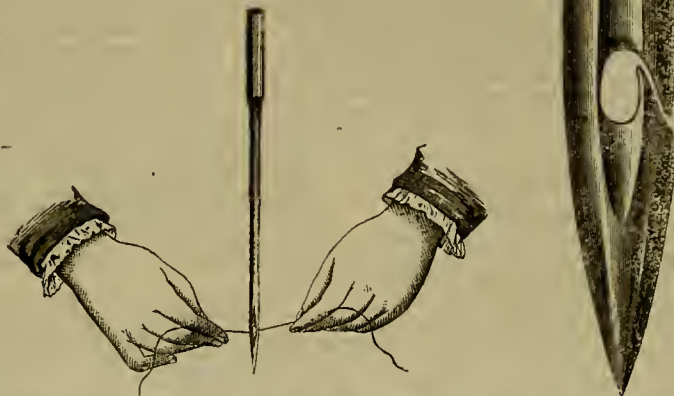
After being tempered, the needles are curved, as above stated, and then ground on a common emery wheel. After this they are wiped, polished, the eyes cleaned out, and are placed in the proper boxes, according to size, ready for sale. The workmen employed are all trained hands, educated to do this peculiar work. Some fifteen hands are now employed. The introduction of this needle to popular use has been successful, and the capacity of the factory is shortly to be increased. It adds another to our list of home manufactures, and it is to be hoped that the company will be under the necessity of obtaining more commodious quarters than they now have, to carry on their business to a greater extent. The cut accompanying this article represents an enlarged view of the Suplee needle, and shows the peculiarity of the eye. The company have also patented a neat and convenient little needle case, capable of holding 12 needles of the size adapted to the thread to be used with them. The needles are placed in different compartments, appropriately numbered to correspond with the numbers stamped on the needles; the numbers designating the thread to be used with the needles are stamped under the proper compartment.

The needle was invented by a lady, Mrs. Hannah G. Suplee, from whom it takes its name.

It is safe to predict that persons who once try the easy-threading needle, will be unwilling to use the old-style once again, as the new invention saves time, eyesight and annoyance—considerations of so much importance to persons interested, that the open-eyed needle will supersede the others. Although the open-eyed needles are not a new invention, as many attempts have been made to provide a needle for sewing machines having for their object the easy introduction of the thread to the needle, this patent succeeds in a more satisfactory manner than previous inventions. A gold medal was awarded to the inventress at the Seventh Industrial Exhibition of the Mechanics' Institute of this City. The office of the company is No. 27 New Montgomery street, where the needles may be seen in practical use.

An Improved Sulky.

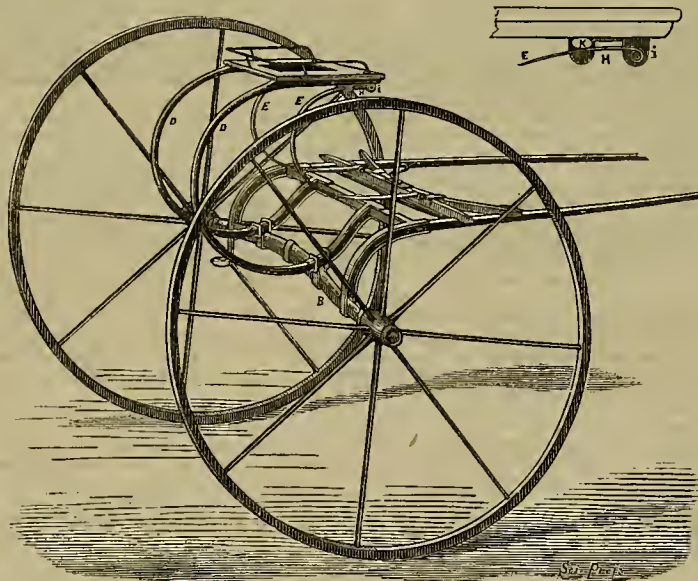
People who are accustomed to ride in sulkies either for racing or training purposes are well aware of the uncomfortable jerking motion



THREADING THE SUPLEE NEEDLE. ENLARGED SUPLEE NEEDLE.

incident to them, caused by the weight of the driver being thrown principally upon the shafts, which communicate the motion of the horse. Mr. John A. Bilz, of Pleasanton, Alameda county, Cal., has recently patented, through the agency connected with this office,

the light of counterfeits, it is interesting to mark the nearness with which some imitations approach the perfection of their originals. It is hard to think that in time all the precious stones, so beautiful in themselves, will be driven from the field by imitations. This is,



AN EASY-RIDING SULKY.

an improvement, the object of which is to attach the seat to the axle in such a manner as to avoid the forward-and-back or "bobbing" movement of the rider, which is caused by the ordinary seat attachment, and thus render riding in this class of vehicle much more pleasant.

The accompanying cut is a representation of this device. *B* represents the axle of any sulky or two-wheeled vehicle. The shafts are attached to the axle in the ordinary method. *D D* are two curved springs, one end of which is secured to the axle, while the opposite ends support the rear of the seat, being rigidly secured to it. These springs can be made of metal or wood, the latter being, however, preferable. The front of the seat is supported by metal springs, *E*, which are also bent in the form of a *C*. The lower ends of these springs are attached to a plate, *F*, by a joint, and the plate, *F*, is fixed to the cross bar of the shafts. The upper ends pass through a projecting lug, *H*, which descends from the bottom of the seat, and is attached forward of this lug by a hinged joint at *i*, to the front of the seat. A block of hard rubber or other

elastic substance, *K*, is fitted between the end of the spring, *E*, and the bottom of the seat, which gives a long elastic bearing for the spring by which it is relieved from sudden shocks or strains.

By this arrangement the weight of the driver is thrown principally upon the axle, and the elastic block in connection with the springs makes the seat a comfortable one and the sulky an easy riding one.

FIRE OPALS.—A friend left at our office, the other day, some specimens of imitations of fire opals which bid fair to equal the real thing. The amount of fire and general resemblance are such as to deceive practiced judges. Though we cannot but look upon such manufactures in

PATENTS & INVENTIONS.

Telegraphic List of U. S. Patents Issued to Pacific Coast Inventors.

(REPORTED OFFICIALLY FOR THE MINING AND SCIENTIFIC PRESS, DEWEY & CO., PUBLISHERS AND U. S. AND FOREIGN PATENT AGENTS.)

By Special Dispatch, Dated Washington, D. C., March 25th, 1873.

FOR WEEK ENDING MARCH 11th, 1873.
PROCESS FOR MAKING COKE FROM LIGNITES.—Harry Eugleman, Salt Lake City, Utah.
SAW HOLDER.—Henry Thomas, S. F., Cal.
ACCOUCHMENT COUCH.—Eliza Lavinia Moore, S. F., Cal.
SWIVEL HOISTING APPARATUS.—Thomas M. Martin, assignor to self and A. S. Hallidie, S. F., Cal.
WHEEL FLOW.—Louis Sachse, Monmouth, Oregon.
AGEING WINES AND LIQUORS.—Adolph Laquet, Monmouth, Oregon.

The patents are not ready for delivery by the Patent Office until some 14 days after the date of issue. NOTE.—Copies of U. S. and Foreign Patents furnished by Dewey & Co., in the shortest time possible (by telegraph or otherwise) at the lowest rates. All patent business for Pacific coast inventors transacted with greater security and in much less time than by any other agency.

Foundry Work—The Risdon Iron and Locomotive Works

The Risdon Works are at present running up to their full capacity, and have on hand some very large machinery. They are employing 275 men at present, and will add fifty more to this number in a week or so. The large cylinder for the steamship Arizona, of which we have before spoken, is just finished, and will be shipped to Benicia in a few days, where it will be put on board under the Bishop derrick. The condenser is already there. The cylinder bottom and valve chests are now being fitted on the cylinder, and will go to Benicia with it. The whole of the above-mentioned work—condenser, cylinder-bottom, valve-chest and piston were cast perfect the first time—something remarkable, when it is considered that either piece is called a heavy casting—the five pieces amounting to over 100,000 lbs. weight.

The large machinery made for the Imperial mine has all been shipped, except the pump gears, just being finished, and weighing 22 tons. This part was detained on account of the great weight breaking down one of the tools in the machine shop. This has, however, been replaced by heavier machinery, capable of making even larger gears than these. The engine for the revenue cutter is nearly ready for the boat, which is expected to be launched at the next spring tides; the boiler and shaft are already in place. The propeller is made of brass, weighs 4,200 pounds, and was cast at this establishment.

A visit to the shipyard at the Portrero would pay those interested in ship-building, about which so much is being said at present. It reflects great credit upon the builders (Dickey Bros.), and if good work will secure to California the building of her own Revenue Cutters, Captain White, under whose supervision this one is being built, is determined we shall deserve it.

The boiler department of the Risdon Works is engaged in making the water pipe for the Virginia Water Works, 36,500 feet long, 12 inches in diameter. They are building a complete set of hydraulic machinery to work the pipe, having a steam pump, accumulator, hoist, etc., working under a pressure of two thousand pounds to the square inch. A number of other jobs are in course of construction more or less advanced. The orders for our wheels keep the foundry busy and it is supplying the various railroads, street railroads and mines with regular chilled iron.

MORE COAL.—Other deposits of coal have been found in Contra Costa county, at different points on the proposed line of the narrow-gauge road from Oakland to Contra Costa county. It has the appearance of being better than any yet found upon this coast. It bears a general likeness to the English cannel coal.

TRADE SCHOOLS.—The idea of teaching trades in connection with schools has been practically adopted at a school in Vienna where girls are taught type-setting.

THE PENNSYLVANIA Central Railroad Company owns and controls 5,000 miles of railroad valued at \$300,000,000.

THE CIRCULATION of the two gold note banks in this city, was on the 18th inst. \$1,124,340 in gold notes.

we believe, the first successful attempt to imitate the fire opal. The maker will no doubt have a good thing of it.

MR. LOUIS JANIN, the well-known mining expert, will shortly leave for Japan on professional business. He goes, we understand, in the employ of English gentlemen under engagement for one year at a salary of \$1,000 per month, with his expenses paid. He has purchased an extensive assaying and engraving apparatus to take with him.

THE Pacific Iron Company has been incorporated in Portland, for the very important work of manufacturing railroad and merchantable iron.

MR. GEORGE ATTWOOD, son of Melville Attwood, M. E., has been appointed resident manager of the famous Emma mine, in Utah.

THE HORSE DISEASE is interfering with the shipment of bullion from the Cerro Gordo mines.

Highland District and the Mendha Mill.

The editor of the *Pioche Record* has been making a visit to Highland District and the Mendha Mill and has gathered the following notes:

Highland is, as the crow flies, about four miles west of Pioche, but the district by the wagon road, is about 7½ miles. The increasing interest which is being felt here in Highland District made us glad that the opportunity had been thus offered to ascertain its progress, prospects and resources from personal observation, and we at once decided to avail ourselves of it to the fullest extent.

The Mendha Mill.

We found Mr. J. B. White on the ground, who is erecting the new Mendha 20-stamp mill under contract—being the gentleman who erected the Magnet and American Flag mills, and the Raymond and Ely mills. Mr. White politely showed us every attention in taking notes of the construction of the Mendha mill. All the material was on the ground, and much of it in place. It will probably be the strongest and most substantial mill in the State, as the Superintendent has refused to accept machinery and material of all kinds which was not first-class, and all the late improvements have been secured. The foundation timbers of the mortar-beds are two feet square, full measure, and 14 feet long. They were sawed out 40 miles northeast of Pioche. We had thought such large timbers could not be procured within that distance. The main battery posts were procured in the same locality, and are nearly as large. Some of them are 12x24 inches, and the others 20x24 inches, clean sawed, and they are all 24 feet long. The main boxes of the battery are 20x12 inches square and 26 feet long.

Engine and Boiler Room.

The engine and boiler room will be 36x38 feet, and 16 feet between joists. The north side wall is constructed of gray limestone, three feet thick and 14 feet high, with a wall-angle between the boiler and battery rooms of the same character, the masonry being of the strongest and most particular kind, strength and durability being controlling considerations in its execution.

Battery Room.

The battery-room is 40x42 feet in the clear. The battery pit is 26 feet long, 5½ feet wide, and 9 feet deep. It will be filled in with carefully screened sand, which will be tamped in every part with hot irons, thus insuring greater firmness and solidity than could be attained by any style of rock-and-mortar masonry—in fact, a solid porphyry block could not be stronger. Over this 20 stamps will be put in operation, of 750 pounds each.

The Steam-Works.

We will be better able to give a detailed description of the steam-works of the Mendha mill after they get into operation. The engine cylinder is 16 inches in diameter, and has a thirty-inch stroke. The power is 35-horse. The boilers are 43 inches in diameter in the clear, and 16 feet long, with large steam and mud drums attached. Connected are all the latest improvements in the application of steam power to quartz mills. Every part of the machinery was made expressly to fill the order of the Mendha company, and a more complete and perfect bill was never shipped from San Francisco. The machinery was all manufactured in the Union Iron Works, of that city.

Strength of Construction.

The mill is durably and powerfully braced throughout—on all sides and at all points. The pan and settler frames are undoubtedly the strongest in the State, the timbers used for the purpose being the largest that could be procured in the forests of southeastern Nevada. The breast-wall back of the pane is three feet thick and eight feet high. Extending up through the center of the wall are wrought anchor-bolts of one and a quarter inch iron. On the east side are belt-pit walls three feet thick, being four feet apart. Massive wrought iron bolts extend up through the inside wall to hold firmly the machinery above. A solid wall of gray limestone and porphyry extends along the entire north side of the building. The mortar was made of an excellent fire-clay, which is found in abundance three-quarters of a mile from the mill-site, and the best sand for the purpose, composed of disintegrated porphyry with the felspar washed out was found right at hand. The mason work was all done under the supervision of Mr. Terry Maginnis, a mason of great experience and rare skill.

The Roasting Furnace.

To the west of main building is being erected a Stetefeldt furnace for roasting the ores. The interior of the furnace establishment will be 36x30 feet. The furnace will be twenty feet and five inches long, eight feet and two inches wide,—exterior measurement, of course—and twenty-eight feet high. The dust-chamber attachment is of the most approved pattern. The drying surface is immense, embracing 414 square feet. The foundations are of fire-proof porphyry, which was quarried out a half a mile from the mill-site, with thick walls of porphyry and brick.

The Blacksmith Department.

Under the supervision of J. J. Paul, is very complete. Among its facilities are patent punching machines, full sets of screw-plates, the best of forges, etc.

The General Supervision.

Without wishing to detract from the credit due Mr. White, the contractor, for the energetic, skillful and efficient manner in which he has directed the mechanical work of constructing the Mendha mill, in all departments, we must commend the judgment and tireless vigilance of Professor Mathey in carrying his general supervision to the most minute details. Confident of the financial success of the enterprise—knowing, from his own personal tests and observations, that rich ores are owned by the Mendha company in inexhaustible deposits—he has all improvements made with a view to permanency, and there is scarcely a bolt or stick of timber in the Mendha mill, or to be put into it, which has not passed or will not pass his personal inspection. Though a scientific gentleman, having been educated in the mining department of one of the first institutions of learning in Paris, he has had years of experience in mining and milling gold and silver ores, and is eminently practical in all he undertakes.

Location and Water Supply.

The Mendha mill is situated in a beautiful little glen, which is walled in on the south and west by picturesque, cedar-covered mountains. At the head of a cañon to the southeast, a little over a mile distant, are prolific and ever-flowing springs, which Professor Mathey has secured in the name of the company. By a system of pipe conductors this water is all brought down to a large reservoir at the west of the mill. There is at hand a large supply of hose in case of an outbreak of fire.

How to Search for Metals.

Searching for Gold.

The paying localities of gold deposits are the slopes of mountains. Gold need not be looked for in the anthracite and bituminous coal fields, nor in limestone rock. The thing itself is the surest indication of its existence. If soil or sand is washed, and the particles of gold are not heavy enough to remain at the bottom, but float away, the bed will not pay.

Along streams rather high up among the mountains, and in the gravelly drift covering the lower slopes, are the best prospects. Where the stream meets an obstacle in its path, or makes a bend, or has deepholes, there we may look for "pockets" of gold. Black or red sands are usually richest. Gold bearing rock is a slate or granite abounding in rusty looking quartz veins, the latter containing iron pyrites or cavities. Almost all iron pyrites and silver ores may be worked for gold. When the quartz veins are thin and numerous rather than massive, and lie near the surface, they are considered most profitable. As traces of gold may be found almost everywhere, no one should indulge in speculation before calculating the percentage and the cost of extraction.

Gold hunting is a lottery with more blanks than prizes.

The substances most frequently mistaken for gold are iron pyrites, copper pyrites and mica. The precious metal is easily distinguished from these by its malleability (flattening under the hammer) and its great weight, sinking rapidly in water.

Searching for Silver.

This metal is usually found with lead ore and native copper. Slates and sandstones intersected by igneous rocks, as trap and porphyry, are good localities. Pure silver is often found in or near iron ores and the dark brown zincblende. The Colorado silver lodes are porous at the surface and colored more or less red or green. Any rock suspected of containing silver should be powdered and dissolved in nitric acid. Pour off the liquid and add to it a solution of salt. If a white powder falls to the bottom, which, upon exposure, turns black, there is silver in it. Silver mines increase in value as in depth, whereas gold diminishes as we descend.

Searching for Copper.

The copper ores, after exposure, or after being dipped in vinegar are almost invariably green on the surface. They are most abundant near trap dykes. The pyrites are generally found in lead mines, and in granite and clay slate. Copper very rarely occurs in new formations, as along the Gulf borders, and in the Mississippi valley south of Cairo.

Searching for Lead.

Lead is seldom discovered in the surface soil. It is also in vain to look for it in coal regions. It must be sought in limestone and slate rocks. A surface cut by frequent ravines, or covered by vegetation in lines, indicates mineral crevices. The galena from the slate is said to contain more silver than that from the limestone. The purest specimens of galena are poorest in silver; the small veins are richest in the more precious metal. A lead vein is thickest in limestone, thinner in sandstone, and thinnest in slate.

Searching for Iron.

Any heavy mineral of a black, brown, or yellow color may be suspected to be iron. To prove it, dissolve some in sulphuric acid and pour in an infusion of nut gall or oak bark; if it turns black, iron is present. If a ton of rich magnetic ore costs more than \$1 at the furnace, good hematite more than \$3, and poor ore more than \$1.50 or \$2, they are too expensive to pay, unless iron is unusually high.

Deep mining for iron is not profitable. Generally speaking, a bed of good iron ore, a foot thick, will repay the cost of stripping it of soil, etc., twelve feet thick. Red and yellow earths, called ochre, contain iron. Magnetic ore is easily found by a compass.—*Orion's Underground Treasures.*

The Material Prosperity of Utah.

A letter from Salt Lake City to the New York *Tribune* gives an interesting resume of the progress of Utah during the past year. The following are some of the statistics:

Utah produced about 5,000 tons of ore in 1870; calling one ton of bullion equal to three tons of ore; about 20,000 tons in 1871; and, reducing the bullion to ore at the same rate, about 27,000 tons in 1872. The statistics are easily got at, because, substantially, the entire production is carried by the Utah Central Railroad, either in ore or bullion. The value of ore and bullion produced in 1872 is a little more than \$3,000,000. A much larger proportion of the ore mined was reduced here in 1872 than in 1871; the bullion yield for that year being, in round numbers, 1,100 tons and for last year 5,500. There are now thirty to forty smelting furnaces in the Territory, calculated to be able to reduce 150,000 tons a year. It may be thought strange that with such an ore-reducing capacity the product of bullion should be but 5,500 tons. The reason, in brief, is because there is a great deal more smelting capacity than ore at present, and a great deal more cheap "blowing" than either. The territory has produced about three millions in value during the year, while Nevada has produced \$25,000,000; yet Utah indulges in more boasting about her mineral interests in a week than Nevada does in a year. A single mine in the latter State (the Belcher) turned out 83,000 tons of ore in 1872, worth \$57.63 per ton, of which \$37.12 per ton was cleared.

Comparisons are odious, but so much and such groundless misrepresentation, to draw it mildly, is exceedingly tiresome. Statements that there are a half dozen mines in Utah, dividing their millions in dividends every year; that the production in 1872 was \$18,000,000; that, as Mr. Bushnell writes you, it is likely to be \$100,000,000 between 1872 and 1877—four years—are flying in every direction all over the world. The Territory is prosperous, the mines are being opened and improved, furnaces and mills are going up, new mines are being discovered, and new fields plowed, railroads are building, and new ones projected wherever desirable; the truth is the truth, and is good enough; the production of silver, lead, copper and perhaps some other metals, is likely to steadily increase for a number of years; and it has room to do so for at least ten years before it will be in value what is already claimed for it. If Utah shall be producing altogether from her mineral resources \$10,000,000 annually by 1880, it will be a growth and development to be proud of.

Speaking of railroads, seventy-four miles have been completed during the past year—eighteen of the standard gauge on the Utah Southern; sixteen on the three-foot gauge, on the American Fork Railroad, and forty of the three-foot gauge of the Utah Northern, from near Coriune, on the Central Pacific to Logan, northward. There are about a dozen other roads projected, mostly narrow-gauge.

SNOW SHEDS.—The *Truckee Republican*, of March 15th, says: The railroad company have suffered much from the burning of their snow sheds in the summer and fall, and have bit upon a plan to prevent in the future any very extensive conflagration. They have already commenced putting in, between Cisco and Emigrant Gap, iron roofs and sides to the sheds. These iron fire-breaks are put up in sections of about 150 feet in length. The wooden sheds are left in sections of 1,800 feet each, the iron sections being between them. If the wooden sheds take fire, they can at the most, only burn 1,800 feet at a time, for when the fire reaches the iron sections it can go no further. The iron used for the sides and roofing is about one-sixth of an inch in thickness, and is in sections of, say seven feet long, by two and a-half feet wide. That used for roofing is corrugated or crimped, so that it has gutters to facilitate carrying off the water that may fall upon it. The crimping process also strengthens it. Without some such protection as these iron sections, the company are in danger of losing miles of shedding at a single fire. With such protection, the chances of a fire having a beginning are diminished, and only 1,800 feet can be destroyed at one time.

MINING RIOT IN ENGLAND.—A dispatch from London, dated March 20th, says: "The riot in Wolverhampton day before yesterday was between Englishmen and Irishmen employed in the coal mines in the vicinity of that town. The trouble has been brewing some days and culminated Tuesday in an open conflict. The authorities have arrested over a hundred men who participated in the riot. A dispatch from the scene of disturbance this morning says there are indications of a renewal of hostilities to day. The English miners threaten to strike unless the Irish employees are discharged. The shopkeepers of Wolverhampton, apprehending rioting and depredation, are closing their places of business and there is much alarm among the citizens."

Important Mining Decision.

A dispatch to the dailies dated Washington March 20th, has the following information: W. W. Curtis, Acting Commissioner-General of the Land Office, has rendered an important decision, granting the application of the North Bloomfield Gravel Mining Company for a patent for 1,535 acres of placer mining ground in Virgin Valley Mining District, Nevada County, Cal., situated upon unsurveyed lands. The decision recites that evidence in the case establishes the fact that the applicants have proceeded in accordance with law in all the preliminary proceedings. The claim was contested by parties interested in adverse mineral land locations, and also by Francis Blaine, claiming the lands as agricultural. The decision holds that the claims of the company do not conflict with those of Brackmeyer & Skidmore, the protestants in the case. It holds that the adverse claim filed by John Watt, to a portion of the premises, has not been made out so as to come within the contemplated operation of the sixth section of the Mining Act, for failure to comply with the requirements of the law, and it also appearing that the North Bloomfield Company became owners of the same by purchase in 1866. The adverse claim of Blaine, who alleges that a portion of the land is agricultural and is not mineral within the meaning of the Act, is rejected. The evidence shows that under the lands claimed as agricultural there is a deposit of gravel and gold, and that the company has expended nearly \$1,000,000 in developing and working these gravel mines. It appears that these premises were located for mining purposes many years ago and that said company and their grantors had sufficiently prospected and developed the same to show that said premises are mineral in character and of more value for mining than for agricultural purposes. A reference is made to the decisions of the Land Office and of the Secretary of the Interior, dated last year. In the case of Ekin Smith vs. Absalom Stewart, giving a construction to the tenth section of the Mining Act of July 26, 1866, the Register and Receiver of the Land Office at Sacramento are instructed to list the lands, accordingly, as mineral, and the claim of the mining company is granted.

MINING EXPEDITION.—A despatch from Pioche, Nev., dated the 21st inst., says: A large meeting was held last night of persons contemplating an expedition to the gold and silver fields of the Stiken river, in Northern British Columbia. A number expressed the intention of following Mr. Cargotich, the discoverer. A large party will probably go from here.

ORE SHIPMENTS.—On the 18th inst. 127 car loads of ore were shipped over the Virginia and Truckee Railroad from the Cometock mines to the Silver City and Carcon river mills. This is, we believe, the largest shipment of ore ever made.

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The Emma Mine.

The Emma mine, in Utah, is probably the best known American mine abroad. The circumstances of its sale, the immense sum paid for it, etc., are familiar to all interested in mining matters. Lately the mine has ceased paying dividends and the stock has fallen to one-half its par value. On the success of this mine depends in a great measure, the future of Anglo-American mining, for snob is its position, should failure ensue, small support will again be extended to American mines on the London market. In view of these facts the annual report of the directors of the company will be read with interest. It is as follows:

"In presenting to the shareholders the balance sheet for the year the directors have to express their regret and disappointment that the result is so much less favorable than until very recently than they had reason to anticipate. There have been paid to the shareholders 13 monthly dividends, amounting, including income-tax, to 193,532.5s. 2d.; while on finally making up the accounts to the end of December, it turns out that the funds available for that purpose only amounted to 185,657.13s. 7d., leaving a deficiency of 7,874.5s. 7d., from which it appears that if a full balance-sheet could have been made out in time (which was impossible) the thirteenth dividend would not have been paid in full, although remittances for the payment of the dividend having actually arrived, and the output at that time being sufficient, the directors had no ground for withholding payment of that dividend, or for anticipating difficulty in continuing regular payments.

The directors have, throughout the year, given the shareholders all the information they themselves possessed, and if at times it has been tardy or insufficient, some allowance ought to be made for the fact that the mine is situated in a sterile region of difficult access and 5,000 miles away. It is needless to do more than to refer to the chief causes of disappointment in the result of the year's operations. The disastrous flooding of the mine in June, the consequent caving in of the great chamber and blockade of the tunnel, caused many weeks' entire loss of work, deficient output for a longer period, and greatly increased expense.

This unforeseen misfortune was aggravated by the breaking up of the Cañon road, by the hostile action of the Illinois Tunnel Company taking armed possession of the only accessible part of the mine, and consequent prolonged litigation. It was impossible for the directors to foresee or avert any of these events; but notwithstanding the stoppage, the serious results of which were only gradually ascertained, the reserve on hand enabled the directors to continue the monthly dividends, which indeed they did not consider themselves at liberty to withhold, and after work was resumed they believed the assurance of those in charge that the arrears of output would be very quickly made up. In quantity this was so, but unfortunately the ore obtained since the flooding, and partly owing to the flooding, has proved of lower grade than previously, and fallen short in money value, while the expense was much greater than before, thus largely reducing the margin of profit.

Owing to the time it takes to get the monthly accounts from Salt Lake the directors were long in becoming fully aware of the falling off in value of the ore, but they believed the increased quantity would compensate for this, and that there would be no interruption of dividends. On 19th Nov. Mr. Hussey telegraphed: 'Will increase yield to 100 tons daily during week, also raise rich ore from the bottom,' and he also sent Mr. Park, on 22d Nov., the following estimate of probable quantities to 1st Jan: 'Will get out by 1st Jan. 70-oz. ore, 2,500 tons, which will net me say 50s. per ton, or 160,000 dols; also 350 tons rich ore, which from samples we may call 300 dols., or 105,000 dols., making a net earning of 265,000 dols. from now to 1st Jan.' (over 48,000l.). It was only on 19th Dec. that a telegram from Mr. Park (who acts as the company's agent and banker in New York) informed them that in a whole month only 20,000 dols. had reached him, and it became evident that the January dividend could not be paid, and of this the shareholders were at once informed.

"The small deficiency in the balance-sheet at the end of the year would, however, have been of little importance if the output had now reached a satisfactory amount, or if the prospects of it doing so were immediate. There is, however, still much of the winter to come, and the accounts from the mine tend to show that the rich ore in the deep level is less in quantity than was expected, and indicate changes in the quality of the ore, rendering much more selection necessary, and therefore greater expense and less output. Much of the ore, although retaining its average quantity of silver, is deficient in the proportion of lead stipulated for in the existing contracts, which were entered into with a view of maintaining a regular dividend, and seems taking more the character of ore for 'milling' than for 'smelting,' requiring a different treatment for its reduction, and therefore a different market. This may not cause loss, but, if continued, it is likely to create considerable inconvenience and perhaps delay; but by last advices it is stated that a contract has been made for the sale of 2,000 tons of this class of ore. It is fair to remark here, however, that the greater part of the mine remains unexplored, and that

besides existing reserves, the second-class ore, estimated by Professor Silliman at 8,000 tons, to which additions have since been made, still remains on hand, and will be available as soon as the best mode of treating it is ascertained. Mr. Husey having expressed a strong wish to be relieved, on account of his own business requiring all his time, the directors have been looking out for a man of experience and ability, and at the same time with thorough knowledge of mining; and they have engaged Mr. George Attwood, who has been most highly recommended to them, and who has already started for Utah to fill the post of resident manager. He is instructed, on his arrival, to send full information as to the condition and prospects of the mine, and to push explorations vigorously.

"The directors are of opinion that the shareholders are prejudiced by the very speculative character that attaches to their stock. They believe that the monthly dividend and the weekly telegram have a good deal to do with that. The monthly dividend clearly cannot be kept up steadily without a large cash reserve, and this, so far, the directors have failed in attaining. They recommend the following change: That instead of an interim monthly dividend of stated amount, interim dividends be paid from time to time of such amount as the directors find themselves in a position to pay. The directors have passed a resolution among themselves that their fees be reduced to one-half their present amount, with the addition of a commission of one per cent. on the net profits; but in no case shall the remuneration exceed the amount provided by the articles. They have made this change because they think the principle a correct one, that their remuneration should depend in some part on the prosperity of the company. The directors have lost the services of Percy Doyle, Esq., C. B., who has been obliged to resign on account of ill-health. Sir H. Selwin Ibbotson, Bart. M.P., and Sir Charles Wingfield, M.P., K.C.S.I., and C.B., have, however, joined the Board. At this meeting auditors must be elected for the ensuing year. Messrs. Kemp, Ford and Co., the present auditors, offer themselves for re-election."

S. F. MARKET REPORT.

At wholesale when not otherwise indicated.

GENERAL MERCHANDISE.		PAINTS.	
Egg, stand, W. 15¢	—	Stand. W. Lead. 12¢	—
Flour Sacks 15¢	—	White Lead. 22¢	—
Stand. Gennies. 17¢	—	Chalk. 22¢	—
Barley do. 15¢	—	Paris White. 22¢	—
Hessian do. 15¢	—	Venetian Red. 22¢	—
Lead do. 15¢	—	Red Lead. 22¢	—
Coal do. 15¢	—	Litharge. 22¢	—
LAINED GOODS.		RICE.	
Ass'd Pie Fruits	—	China No. 1. 5¢	—
do 2½ cans. 3.00	@ 3.25	do 2. do. 5¢	—
do Teble do. 3.00	@ 3.25	Japan. 5¢	—
Java & Jellies. 2.25	@ 2.50	Hawaiian. 5¢	—
Pickles ½ gal. 1.25	@ 1.50		
COAL-Jobbing.		SALT.	
Australian. 1.10	@ 1.20	Cal. Bay. per ton. 5.00	@ 5.50
Good do. 1.10	@ 1.20	Cal. Bay. 5.00	@ 5.50
Seattle. 1.10	@ 1.20	Liverpool. 24	@ 25
Cumbr'd, cks. 25.00	@ 26.00	do 24	@ 25
do bulk. 22.50	@ 23.50		
Chile. 1.10	@ 1.20	SOAP.	
Lehigh. 1.10	@ 1.20	Castle. 12	@ 12½
Liverpool. 1.10	@ 1.20	Local brands. 12	@ 12½
West Hartley. 1.10	@ 1.20	SPICES.	
Sootch. 1.10	@ 1.20	Allspice, per lb. 27	@ 28
Scranton. 1.10	@ 1.20	Olive. 27	@ 28
Vanover's. 1.10	@ 1.20	C. Sais. 27	@ 28
Charcoal. 1.10	@ 1.20	Nutmeg. 60	@ 65
COFFEE.		Whole. 60	@ 65
Costa Rica per lb. 19	@ 20	Ground Allspice 25	@ 30
Guatemala. 18	@ 19	do. 25	@ 30
Java. 18	@ 19	do. 25	@ 30
Manilla. 18	@ 19	do. 25	@ 30
Ground in cks. 27	@ 28	do. 25	@ 30
Chicory. 18	@ 19	do. 25	@ 30
FISH.		do. 25	@ 30
Pee. Dry Cod new	—	do. 25	@ 30
bundled. 8	@ 8½	do. 25	@ 30
Eastern Cod. 8	@ 8½	do. 25	@ 30
do 2½ cans. 8.00	@ 8.50	do. 25	@ 30
do 2½ cans. 8.00	@ 8.50	do. 25	@ 30
do 2½ cans. 8.00	@ 8.50	do. 25	@ 30
do 2½ cans. 8.00	@ 8.50	do. 25	@ 30
Pick. Cod. 8.00	@ 8.50	do. 25	@ 30
do 2½ cans. 8.00	@ 8.50	do. 25	@ 30
Pug. Sd. Smok'd	—	do. 25	@ 30
Heir Gals. 9.50	@ 10.00	do. 25	@ 30
Mac'd No. 1. 9.50	@ 10.00	do. 25	@ 30
" Extra. 10.00	@ 10.50	do. 25	@ 30
" in cks. 10.00	@ 10.50	do. 25	@ 30
" mess. 10.00	@ 10.50	do. 25	@ 30
" ex. mess. 10.00	@ 10.50	do. 25	@ 30
NAILS.		do. 25	@ 30
Assorted sizes. 5½¢	@ 6	do. 25	@ 30
OILS.		do. 25	@ 30
Pacific Olive Oil. 1	@ 1.20	do. 25	@ 30
Neat F. No. 1. 25	@ 26	do. 25	@ 30
Ceator Oil. No. 1. 35	@ 36	do. 25	@ 30
do do No. 2. 1.25	@ 1.30	do. 25	@ 30
Coccol Nut. 60	@ 65	do. 25	@ 30
Olive Plagnol. 5.00	@ 5.50	do. 25	@ 30
do Posel. 4.75	@ 5.00	do. 25	@ 30
Palm. 5.00	@ 5.50	do. 25	@ 30
do Bagialnpi. 1.05	@ 1.10	do. 25	@ 30
Linseed. 1.05	@ 1.10	do. 25	@ 30
China nut in cks. 75	@ 80	do. 25	@ 30
Sperm. crude. 25	@ 26	do. 25	@ 30
do hatched. 1.90	@ 2.00	do. 25	@ 30
Coast Whales. 40	@ 45	do. 25	@ 30
Polar, refined. 55	@ 60	do. 25	@ 30
Lead. 40	@ 45	do. 25	@ 30
Coal, refined Pet. 40	@ 45	do. 25	@ 30
Oleobline. 40	@ 45	do. 25	@ 30
Devils Brt. 40	@ 45	do. 25	@ 30
Long Island. 40	@ 45	do. 25	@ 30
Eureka. 40	@ 45	do. 25	@ 30
Downer Kerosene 55	@ 60	do. 25	@ 30
Gas Light Oil. 42	@ 45	do. 25	@ 30

LUMBER MARKET.

CARGO PRICES OF		PUPPET SOUND PINE	
REDWOOD.		—Retail Price.	
Rough, 3/4 M.	\$20 00	Rough, 3/4 M.	\$25 00
Rough refuse, 3/4 M.	16 00	Flooring and Step, 3/4 M.	37 50
Rough clear, 3/4 M.	32 00	Flooring, narrow, 3/4 M.	40 00
Rough, 1/2 M.	20 00	Flooring, 2nd quality, 3/4 M.	30 00
Rnais, 3/4 M.	25 00	Laths, 3/4 M.	4 00
Rnais, refuse, 3/4 M.	24 00	Rough, 1/2 M.	20 00
Surfaced, 3/4 M.	22 50	Rough, 3/4 M.	\$25 00
Surfaced, 1/2 M.	18 00	Rough refuse, 3/4 M.	20 00
Flooring, 3/4 M.	30 00	REDWOOD—Retail.	
Flooring, refuse, 3/4 M.	20 00	Rough Pickets, 3/4 M.	18 00
Begged round, 3/4 M.	32 50	Rough Pickets, 1/2 M.	16 00
Half-inch Siding, 3/4 M.	22 50	Fancy Pickets, 3/4 M.	30 00
Half-inch siding, ref. M.	20 00	Siding, 3/4 M.	27 50
Half-inch Surfaced, 3/4 M.	25 00	Tongued and Grooved, 3/4 M.	40 00
Half-inch Surfaced, 1/2 M.	22 50	Half-inch Surfaced, 3/4 M.	40 00
Half-inch Battens, 3/4 M.	22 50	Half-inch Surfaced, 1/2 M.	40 00
Pickets, rough, 3/4 M.	14 00	Rustic, 3/4 M.	42 50
Pickets, rough, 1/2 M.	12 00	Shingles, 3/4 M.	3 50
Shingles, 3/4 M.	4 00	Shingles, 1/2 M.	3 50

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PACIFIC IRON WORKS,

First and Fremont streets,

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Steam Engines and Boilers,

MARINE AND STATIONARY,

IRON AND BRASS CASTINGS

Mining Machinery of Every Description,

And all other classes of work generally done at first-class establishments, manufactured by us at the lowest prices, and of the best quality.

Particular attention paid to Jobbing Work and Repairs.
N. B.—Sole Agents for sale of HUNTOON'S OLEBRATED PATENT GOVERNOR.
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Foundry and Iron Works.

HINCKLEY & CO.,

MANUFACTURERS OF

TEAM ENGINES,

Quartz, Flour and Saw Mills,

also Improved Steam Pump, Brodie's Improved Crasher, Mining Pumps, Amalgamators, and all kinds of Machinery.

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GEORGE T. PRACY, MACHINE WORKS,

109 and 111 Mission Street,
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These Works have lately been increased, by additional Tools, and we are now able to turn out any kind of work, equal to and cheaper than any establishment in the State; that is to say:—

STEAM ENGINES,
Flour and Saw Mills,
QUARTZ MACHINERY
Printing Presses,

AND MACHINERY MADE OF EVERY DESCRIPTION.

Improved Safety Store Hoists,

Fitted with Cutting's Patent Cams, unequaled for safety, convenience and cheapness. This Hoist can be built for about half the price of any other in use. To be seen at HAWLEY & CO.'S.

ALSO, MANUFACTURER AND SOLE AGENT FOR
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TURNING LATHES, Etc., constantly on hand.
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UNION IRON WORKS, Sacramento.

ROOT, NEILSON & CO.,

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CROSS' PATENT BOILER FEEDER AND SEDIMENT COLLECTOR

Dunbar's Patent Self-Adjusting Steam Piston
PACKING, for new and old Cylinders.And all kinds of Mining Machinery.
Front Street, between N and O streets,
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Every Variety of Shafting,
Embrazing ALL SIZES

Steamboat Shafts, Cranks, Piston and Connecting Rods, Car and Locomotive Axles and Frames

HAMMERED IRON

Of every description and size.

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The highest price paid for Scrap Iron. 9-14

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CAPITAL.....\$1,000,000.LOCATION OF WORKS:
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Manufacturers of Steam Engines, Quartz and Flour Mill Machinery, Steam Boilers (Marine, Locomotive and Stationary), Marine Engines (High and Low Pressure). All kinds of light and heavy Castings at lowest prices. Cams and Tappets, with chilled faces, guaranteed 40 per cent. more durable than ordinary iron.

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James D. Walker.WM. H. TAYLOR.....President
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LEWIS E. MEAD.....Secretary
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Hydraulic Machinery,

Quartz Crushing and Amalgamating
Machinery

Of every description, constantly on hand.

Plans and estimates furnished upon application. Repairs upon all kinds of Machinery promptly made, and at moderate charges.

Having unrivaled facilities, we are prepared to make to order, at short notice, anything required in our line. Specimens of our work may be seen in all the mining regions on this coast.

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137 and 139 First st., near the Gas Works, San Francisco.

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IRON CASTINGS of all descriptions at short notice. All orders punctually executed in time agreed on. Particular attention paid to making superior Shoes and Dies. Among the special castings of this Foundry are the well known CALLAHAN GRATE BAR, of superior merit for burning screenings—all size Bars. STRATTON'S JACK SCREWS, all sizes. Superior, compact and effective Horse Powers, Pumps, Agricultural Castings, Ingot Moulds, Assaying and Refining Retorts and Kettles, and a great variety of other and special castings.

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Steiger & Boland are the sole Manufacturers of the Improved Hepburn Roller Pan. The patterns having all the improvements to those Pans, are at the Occidental Foundry, enabling the Establishment to deliver all pans and parts thereof with uniformity, finished in the best style, and at the lowest possible price. Pan Castings furnished the trade, with liberal facilities for erection, &c. All persons are cautioned against making, selling or using these Pans, except through the authorized agents and manufacturers, viz., Steiger & Boland, of the Occidental Foundry, S. F.

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DAWSON & BAILY,

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Every Kind of Railway Service.

NARROW GAUGE AND MINE LOCOMOTIVES A SPECIALTY.

All work accurately fitted to gauges, and thoroughly interchangeable.

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Photographs of Locomotives can be seen at the above Number. 12-26-74

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IMPORTANT TO

Quartz Mining Companies.

IMPROVED PATENTED

Hardened Cast Steel Shoes & Dies.

The undersigned are prepared, at short notice, to furnish IMPROVED PATENTED HARDENED CAST STEEL SHOES AND DIES, for Quartz Mills of every pattern. This improvement supplies a want long needed by persons engaged in Mining enterprises.

They are more economical and cheaper than CAST IRON SHOES, as they wear from four to six times as long, and crush a greater quantity, as they retain their full diameter, never chipping from the edges. This, with the time saved in replacing worn and broken iron Shoes and Dies, and the great saving of freight to remote mills and mines, makes a vast difference in the cost of reduction of ores.

WE ALSO FURNISH
Cast Steel Tappets, Cams, Picks and Hammers,

Which possess the same advantage of Economy and Durability, and deserve the special attention of Miners and others engaged in quartz crushing.

The Superior Strength of these steel castings—the fact that they can be FORGED AND WELDED as easily as cast steel—their cheapness and great accuracy, as compared with forged iron—cannot fail to make them desirable for many purposes, where forged iron and steel have heretofore been used. Among such articles we mention:

ROLLING MILL CASTINGS.

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AGRICULTURAL CASTINGS.

Reaper Guards, Plow Shares, Mold Boards, Plow Joint-cres, etc.

Anvils, Sledge, Vices, Masons' Hammers, Blacksmith Hammers, Mattocks, B. R. Frogs, etc.

And other articles requiring solidity and great strength.

DONKEY ENGINES FOR HOISTING,
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Persons giving orders will send diagrams and measurements of Shoes and Dies, etc., as above.

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12-25-74Scaling and Foaming Prevented and
Fuel Saved.

Enquirers are respectfully informed that

WARSON'S AERO STEAM SYSTEM

Has been well tested, during three years, in England. Besides the above advantages, it greatly prolongs the life of Boilers, Tubes and Fire-boxes.

It is a cheap contrivance, and easily applied to any engine.

Illustrated Circulars, showing the appliance and describing its advantages, are sent to all applicants.

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Information Required to Give an Estimate
of Warson's Apparatus:

- 1.—Diameter of Cylinder.
- 2.—Length of Stroke.
- 3.—Number and Length of Boilers—Tubes or Flues.
- 4.—Distance of Boilers from Engine.
- 5.—Can Pump Piston be attached to Cross-head of Engine?

It can, however, be driven by any of the usual appliances that work the Water-Feed Pump.

These items will enable me to give a near estimate of the cost.

J. L. SANFORD, General Agent.

12-26-74

Notice is hereby given, that the copartnership heretofore existing between A. J. Severance, Charles W. Randall and J. Gus. Burt, under the firm name of "Severance, Holt & Co.," is this day dissolved by mutual consent. A. J. Severance, having purchased all the interest of his late partners, will continue the business of manufacturing and selling Diamond Drills as before, under the style of A. J. Severance & Co.

Dated San Francisco, Nov. 24, 1871.

Office, 316 California street. A. J. SEVERANCE,

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22-23-74

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Repairing done on very Reasonable Terms and in the best manner. No. 32 Fremont street, S. F. 19-73-3m

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The Great Labor Saver of the Household.

ECONOMY, CONVENIENCE AND SAFETY COMBINED.

JUST THINK OF IT—No Wood, no Coal, no Coal Gas, no Stove Pipe, no Chimney, no Smoke, no Ashes, no Dirt, no Wood Boxes, no Coal Scuttles, no Kindling Wood, but a Friction Match, and the Fire in Full Blast in Half a Minute!

OVEN HOT IN TWO MINUTES.

Steak broiled in seven minutes! Baked Beans in thirty minutes! The fire extinguished in a moment! And the house unheated!

It has no rival in all kinds of Cooking and Flat Iron Heating, and combines Economy, Convenience, Neatness, Safety and Durability! The Ladies Welcome it; a Little Child can operate it, and

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Prices from \$6 to \$25, according to size.

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SPORTING,

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POWDER.

OF SUPERIOR QUALITY, FRESH FROM THE MILLS. It being constantly received and transported into the interior, is delivered to the consumer within a few days of the time of its manufacture, and is in every way superior to any other Powder in Market. We have been awarded successively

Three Gold Medals

By the MECHANICS' INSTITUTE and the STATE AGRICULTURAL SOCIETY for the superiority of our products over all others.

We also call attention to our

HERCULES POWDER.

Which combines all the force of other strong explosive now in use, and the lifting force of the BEST BLASTING POWDER, thus making it vastly superior to any other compound now in use.

A circular containing a full description of this Powder can be obtained on application to our Office.

16-20-3m JOHN F. LOHSE, Secretary.

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BELTING
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ROPE & CHORDS
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18-74-2m-hp

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Standard sizes of railroad Car Wheels, with special patterns for Mining Cars. These small wheels are made of the best Car Wheel Iron, properly chilled, and can be fitted up with the improved axle and box—introduced by this company, and guaranteed to outlast any other wheels made in this State.

All kinds of Machinery made and repaired.

24-22-3m JOSEPH MOORE, Superintendent.

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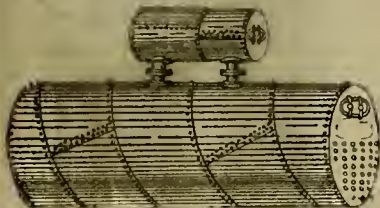


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High and Low Pressure Boilers of all
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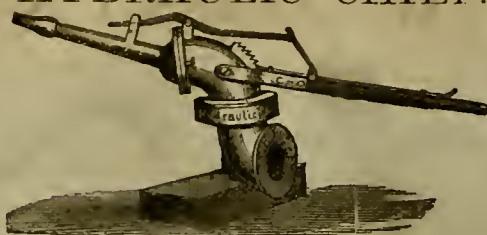
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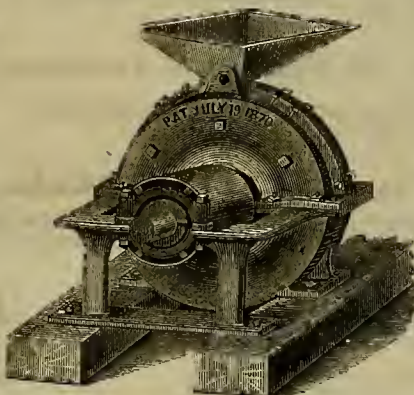
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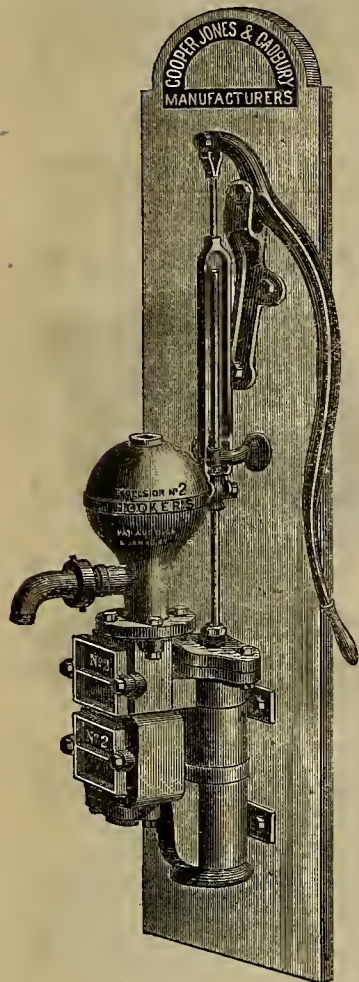
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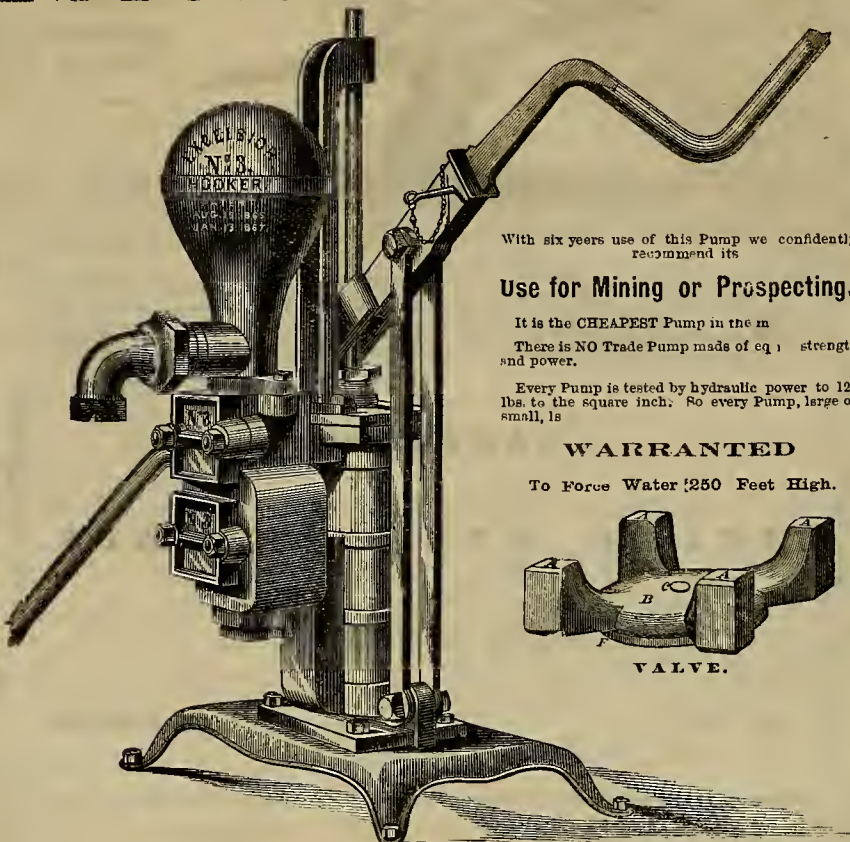
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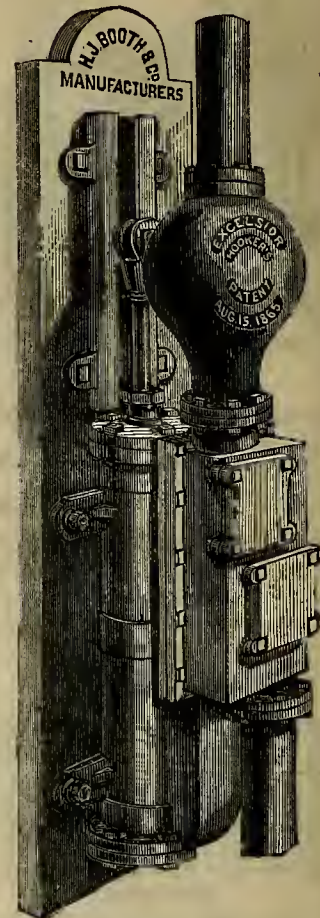
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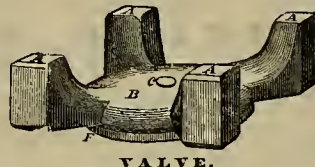
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Superintendent's Office, Sept. 23, 1872.
T. M. MARTIN, Esq.—The Ropeway constructed by you (HALLIDIE'S PATENT) for the Emma Hill Consolidated Mining Company, has been built in a most substantial and workmanlike manner, and is at this time in splendid working condition. I most cheerfully accept the work for the Company, and recommend it to others wishing a sure and speedy transit for ores over places impracticable for wagon roads, etc. Respectfully,
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SAN FRANCISCO, SATURDAY, APRIL 5, 1873.

VOLUME XXVI.
Number 14.

The Prall Steam Pump.

In these days of progress, speed and invention, machinery must take the place of hand-power, wherever such a thing is possible, and we are continually replacing one piece of machinery with another, if the slightest improvement is manifest. This is especially the case with pumps, of which there are probably more varieties and modifications than in any other class of machinery, with the exception, perhaps, of washing machines. In each of these inventions we try to simplify as much as possible the complications of previous articles. With simplicity of construction we attain not only that desirable object, cheapness, but gain space, reduce friction and lessen the liability of the machine getting out of order. One of the late inventions in the line of steam-pumps, which shows a wonderful simplicity of construction and operation is called the Prall Automatic Steam-Condensing, Vacuum and Force Pump, a cut of which is shown on this page. We recently saw this pump in operation at the Pacific Iron Works on First street in this city, where it can be seen by those interested.

The cylinders are made of metal, lined with wood. Into the upper end of each of these cylinders a small steam pipe is led from the boiler, the pipe being opened and closed by a simple two way valve, shown where the covering is broken away in the accompanying cut. A flat plate is placed opposite the mouth of the steam-pipe in the top of the cylinders to deflect and diffuse the steam as it enters. To the bottom of the cylinders is connected a single suction-pipe. Simple check-valves are placed on both the suction and discharge-pipes to prevent a reflow of the water passing upward. The valve-chambers are constructed with face-plates, which admit of ready detachment, so as to admit of removing and replacing the valves. A small injection-pipe communicates from one cylinder to the other, through the valve chest and throws a jet of water into the steam as soon as it has driven the water out of the cylinder. A vacuum is thus formed which draws the water from the suction-pipe and again fills the cylinder.

The automatic movement of the steam-valve, which admits and shuts off steam at the proper moment, is produced by means of a diaphragm of rubber, or of thin elastic metal, and connected with the valve by a simple rod (shown in the cut). This diaphragm is placed between two disks, which are slightly dished on their inner sides to admit of a play or movement of the center of the diaphragm between them, equal to the extent of movement required in the valve. This diaphragm is connected to the cylinders by water channels moved by alternate pressure on each side, thus admitting steam to one cylinder by downward movement and to the other by upward. An air-valve is placed in the upper part of each cylinder, admitting a little air into the top of the cylinder whenever a vacuum is formed.

In the operation of pumps thus constructed the pressure of the water in the cylinder when filled, bearing against the diaphragm, will press it up against its upper plate. The movement communicated through the rod to the upper valve is sufficient to open the valve wide. If steam be now admitted through the steam pipe, it will pass through the valve at the upper end and entering the cylinder will be diffused by the plate placed under the opening, into a stratum of air upon the water. The stratum of air serves to prevent all agitation of the water by the steam when it enters, so that it will spread

itself quietly and evenly over the entire surface and operate directly and as effectively as if upon the piston of an ordinary steam pump. The very thin film of air being instantly heated at the first contact of the steam, all further condensation of the latter is entirely prevented and the full pressure of the steam is brought to bear upon the water, to force it out of the pump through the discharge-pipe, noiselessly, and without friction, to any desired height, in proportion to its initial pressure. When, however, the steam, in expelling the water from

atmospheric pressure, the admission of steam being sufficient to cause a rapid discharge of the water thus elevated. Very small pumps made to operate in this manner with a low pressure of steam are constructed specially for agricultural purposes, to be used by farmers and stock-raisers, in connection with the boilers and cauldrons employed for steaming food for cattle, etc., thus enabling them with but a comparatively slight expenditure of fuel to raise all the water required for stock or irrigation.

As a mining pump it has a great advantage from the fact that there is no exhaust steam, the steam being condensed in the cylinders after it performs its work, so one of the great incon-

veniences of pumps in mines is removed. As there are no pistons, piston rods, stuffing-boxes, levers, cranks or fly wheels it requires no lubrication, and is not liable to be affected by mud, sand or grit of any kind passing through it. With no moving parts, other than the valves, it is not likely to need repair, and as the water flows quickly in and out of the cylinder, it is noiseless in operation. The one we saw at work ran beautifully, there being no intermittent action whatever. The simplicity of its construction and fewness of its parts are greatly in its favor, as it can be sold cheaply.

The pump requires a cubic foot of steam under a given boiler pressure to displace and elevate a cubic foot of water to a height due that pressure, and every foot of steam does double duty—by exerting a pressure to force the water out of the cylinder and by creating through its condensation a vacuum, the pressure of the atmosphere is utilized in filling the cylinders. It only requires a pressure of from one to two pounds of steam to raise the water to an extreme height of 30 feet, and for every foot of elevation above this point one-half pound of additional pressure is necessary. The pump is a model of simplicity in itself and it will repay any one interested in such things to go to the Pacific Iron Works and examine its operation. There is little doubt but that it will be extensively used in mining operations for the reasons above mentioned, and as it does not require an engineer to run it, being automatic, it can be

applied in many places where steam-pumps have not before been used. Small sized pumps of this pattern are made for independent boiler feeders, and will operate to feed boilers automatically, slowly or rapidly at any pressure.

A company has been organized to manufacture this pump, with the following Board of Trustees: Ira P. Rankin, A. G. Stiles, E. F. Knox, Eugene N. Riette and A. P. Brayton. The special manufacturing agency is at the Pacific Iron Works.

Work on Mining Claims to Prevent Forfeiture.

There has been some indecision among our mining community as to whether the amendment to the Mining Law of May 10th, 1872, which was introduced in Congress a short time since, had really become a law. Several papers have published an abstract of the amendment but were uninformed whether it was a law or not. The bill passed the Senate on the 11th of February, 1873, and passed the House on the 26th of the same month. That much came by telegraph; but whether the bill had been signed by the President or not was doubtful. We interviewed the Surveyor General and the Mineral Land Surveyor, but up to Thursday afternoon they had received no official notification that the amendment had become a law. A private telegram sent to Commissioner Drummond on Monday last had elicited no reply up to the time when we to press—Thursday night. We now find from a paper published in Colorado that the bill has really become a law and was approved on the 1st of March. It is as follows:

An act to amend an act entitled "An act to promote the development of the mining resources of the United States."

Be it enacted by the Senate and House of Representatives of the United States in Congress assembled, That the provisions of the fifth section of the act entitled "An act to promote the development of the mining resources of the United States," passed May tenth, eighteen hundred and seventy-two, which requires expenditures of labor and improvements on claims located prior to the passage of said act, are hereby so amended that the time for the first annual expenditure on claims located prior to the passage of said act shall be extended to the tenth day of June, eighteen hundred and seventy-four.

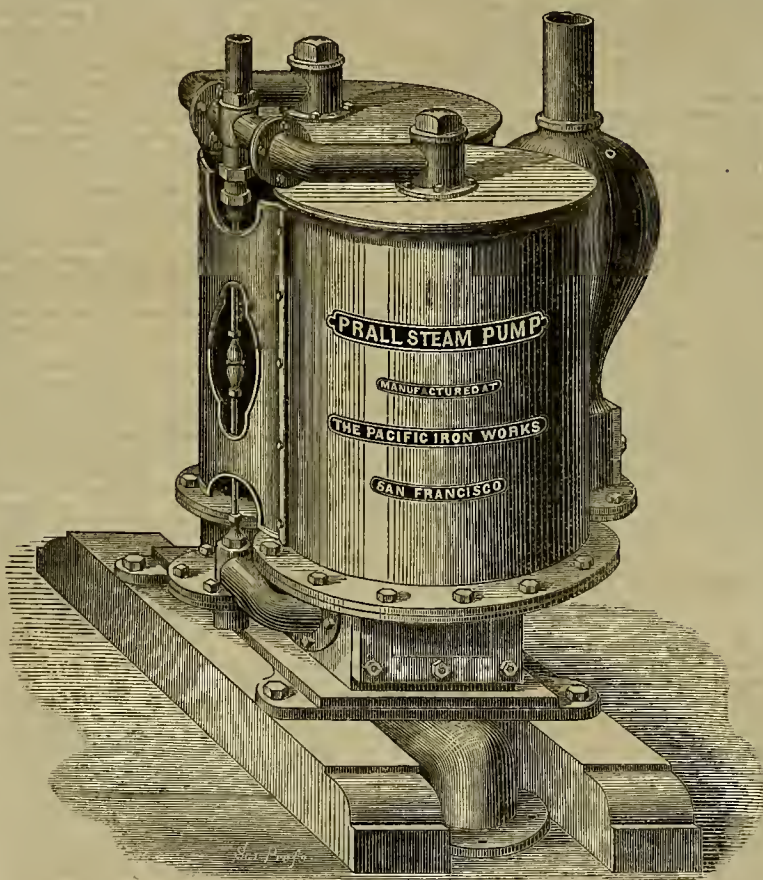
Approved, March 1, 1873.
Department of State, Washington, March 7, 1873.
(A true copy.) R. S. Chew, Chief Clerk.

The original law of May 10th, 1872, provides that on each claim located after the passage of the Act, and until a patent shall have been issued therefor, not less than \$100 worth of labor shall be performed or improvements made during each year.

On all claims located prior to the passage of the Act, \$10 worth of labor shall be performed or improvements made each year for each one hundred feet in length along the vein until a patent shall have been issued therefor; but where such claims are held in common such expenditure may be made upon any one claim; and upon a failure to comply with these conditions the claim or mine upon which failure occurred, shall be open to re-location in the same manner as if no location of the same had ever been made. Provided that the original locators, their heirs, assigns, or legal representatives, have not resumed work upon the claim after such failure and before such location. Under certain conditions prescribed in the Act, if a co-owner fails to do his share of work, the claim becomes the property of the other owner.

It looks something like "red tape" circumlocution to outsiders that this very important amendment—a measure involving thousands of dollars—has not been sent to the Surveyor General's office in this city. It is on this coast particularly, that the application of the amendment occurs, and still we have not been officially informed of its passage through the proper source. We have understood for some time that several parties had been formed in this city for the purpose of taking possession of certain claims upon which the requisite work had not been done, but their generous(?) efforts will now be in vain.

In reading the amendment carefully it will be seen that only claims located prior to the passage of the act of May 10th, 1872, have the benefit of the extension of time, since those located after the passage of the act are not mentioned.



the cylinder, follows it into the discharge-pipe, it is partially condensed, and the pressure on the under side of the diaphragm is so far reduced as to cause the latter to move and close the steam valve, whilst sufficient water is simultaneously withdrawn from the injection-pipe to complete the entire condensation of the steam, and produce a vacuum which will cause the cylinder to promptly fill from the suction-pipe. As soon as the cylinder is filled, the diaphragm will again move under the pressure thereon, steam will again be admitted, and the operation of the pump thus repeated. One cylinder is being filled while the other is being emptied, so the flow is continuous, and no intermittent action is apparent.

In one of the simplest adaptations of the pump for operating with steam at a pressure of from one to five pounds, the delivery-pipes are arranged entirely beneath the pumping cylinder, so that the water may discharge by gravity alone, or with slight additional aid. The condensation of steam admitted at this low pressure will produce a vacuum which will cause the pump to fill, even when placed at a height of 30 feet above the water, by means of

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Utah Smelting Furnaces.

We make the following extracts from an article in the *Salt Lake Tribune*, on the "Smelting Ores of Utah:" "Upon the location of works depends, in a great measure, the economic reduction of the raw materials. The question of transporting the ore to the immediate locality of the fuel, or the transportation of the fuel immediately adjacent to the mines, has been unsatisfactorily solved, resulting, however, in the general adoption of the latter mode without any apparent economy. A number of causes operating together, render the erection of furnaces at the mines, in most instances, objectionable, while the transportation of the ores to the bituminous coal fields, or the timber-bearing lands where charcoal could be obtained, along the lines of the Central and Union Pacific Railways would produce no better results.

The solution of this problem is being effected by the erection of works along the line of the Utah Southern Railroad, between Salt Lake City and Sandy Station, where an economy of at least ten dollars per ton is obtained in the reduction of ores over either of the above mentioned modes. The concentration of an endless variety of ore by the system of narrow-gauge railroads inaugurated to reach the mines from the latter place, and the facility of obtaining a permanent supply of fuel by the lines of railway reaching charcoal and mineral coal fields, clearly indicate a greater economy in future manufactures by the erection of reduction works in this vicinity.

The next important consideration of the features which will establish the reduction of ores in Utah upon a permanent basis is

An Ample Supply of Fuel,

Efficient as well as accessible, and relatively cheap. Charcoal obtained from California at a cost of \$30 to \$40 per ton delivered at works in close proximity to the Utah Southern Railroad, must sooner or later necessitate the adoption of a substitute for this precarious and expensive article. There are abundant deposits of bituminous and ligneous coals in Echo and Weber cañons in this Territory, as well as the coal fields of Bitter creek in Wyoming Territory, contiguous to the line of the Union Pacific railway, from which coal can be laid down in Salt Lake City at prices ranging from \$7 to \$12 per ton.

The completion of the Utah Southern railroad through the Sanpete valley will place at reduction works along the line of this road an additional supply of fuel, from the bituminous coals of that region, which are of a highly inflammable and richly bituminous character, admirably adapted for reverberatory and refining as well as blast furnace purposes. The efficiency of mineral coal as fuel in the reduction of silver lead ores has been successfully solved in Europe, and its adoption in Utah must follow satisfactorily sooner or later as a matter of course, for whatever practical tests have been made by careful and experienced metallurgists tend to demonstrate that equal results are obtained in the blast furnace by using identical amount in weight of either charcoal or mineral coal. As data entering upon the bearings of this question there ought to be considered the calorific effect of the respective kinds of fuel, and paramount to the chemical constituents of any fuel are to be considered its physical properties, to wit, its power of carrying a burden—a quality especially essential in all metallurgical operations by the vertical blast furnace.

A feature of more than secondary consideration in the economic reduction of minerals is

The Construction of Furnaces.

The general adoption of the cupola blast furnace in the reduction of argentiferous galena and carbonate lead ores, largely predominating in many of the mining districts of Utah, may be regarded as sufficient proof of its superiority in practical metallurgy, notwithstanding many features of primitive simplicity exist in the general construction of our furnaces. It must be borne in mind, however, that for the production of crude bullion by cupola blast furnaces but a few elements are required, viz., charcoal, coke or coal, as fuel, and iron, limestone or other suitable substances, as flux, and upon the economical combination of these substances and the improved form of furnaces depends the quality and profit to be derived from this manufacture; but in this branch of industry, as well as others of importance and value to the human race,

Waste,

The great destroyer of man's fabrics, thrusts in its ruthless hand to curtail some profit in the enjoyment of the product of skill.

To overcome existing defects in this branch of industry the attention of many minds is engaged, and the ingenuity of not a few is endeavoring to solve it. Prominent among the devices proposed are. 1st. The adoption of a heated air blast. 2d. A sufficient quantity and pressure of atmospheric air. 3d. The application of oxygen to the zone of fusion.

The Introduction of a Heated Air Blast

To the reduction of lead ores in the cupola furnace may be considered an experiment in Utah, as only one furnace has been erected having in view the adoption of that important auxiliary, and from which no practical tests have been obtained so far as establishing its efficiency.

In the absence of any practical results, as data bearing upon this question, a few features in favor of its superiority and economy may be cited. In the reduction of iron ores the introduction of a heated air blast having been followed with economy in the production of crude pig iron, its application to the metallurgy of silver-lead bullion would follow satisfactorily, as a matter of course. Although cold air may support combustion in the same ratio as heated air, it does not follow that in metallurgical operations like results would be produced, neither can the supposition be sustained that deleterious chemical changes are produced by the addition of calorific air, as the relative proportions of oxygen and nitrogen in cold air are not altered when heated, and whatever elements exist in cold air are maintained to the same extent in the heated.

The superiority of the heated blast in metallurgical operations consists in the expansion of its volume, producing a more perfect combustion in consequence of the enlarged surface presented by the atoms of oxygen for combination with the carbon of the fuel. This involves a supposition that atoms of oxygen are expanded during processes of combustion.

The economy of heated air consists in the volume of heat carried into the furnace in the ratio of its temperature and pressure when introduced, as well as the economy with which it is produced. To those who do not possess a practical knowledge of the production of heated air for furnaces, it may be well enough to state that the gases usually escaping from the furnace can be utilized in the combustion chamber of the heating oven, as fuel to produce the desired temperature, and could be easily applied to furnaces already constructed. By the combustion of the escaping gases the minute particles of silver and lead would be liberated and deposited in the oven, and the gases usually considered unhealthy for workmen would be purified to such an extent as to form a sanitary provision to the works.

The admission of the air blast upon the zone of fusion, its volume and pressure, are usually considered questions of importance in practical metallurgy. Apparently the volume of air introduced into the blast furnaces of Utah is not projected with a relative pressure. This opinion is supported by two facts, namely: (1st), the general adoption of the rotary blast engine from which a maximum of three-fourths of a pound pressure is obtained, but in practice, however, seldom maintained; (2d), it is a fact well established that a volume of air projected into the furnace at a relatively low pressure creates a zone of fusion on the circumference of the column of material to be fused, while a relatively high pressure would maintain a sphere of fusion in the center of the column instead of its circumference, thereby effecting a more complete reduction of the ores exposed, and saving the fire-proof materials of which the furnace is constructed from the rapid wear to which it is subjected by the low-pressure air-blast. It is also well known that combustion in its chemical action is oxidation, and its mechanical concussion. It, therefore, seems apparent that the force with which the atoms of oxygen are projected upon the carbon of the coal are of paramount importance to an economic metallurgy."

Discovery of Relics of an Ancient Civilization.

Our sister Territories of Arizona and New Mexico will not in the future, as they have in the past, divide between themselves all the interest and glory of having been the theaters of a long-past civilization. Lincoln county, Nevada, steps to the front in claiming an equal share of such notoriety, bringing, in substantiation of her claims, hieroglyphic stones, figured pottery, stone implements of husbandry, etc. Day before yesterday, on the line of the Pioche and Bullionville Railroad, on the foothills about half way between the two places, relics of a by-gone civilization of these kinds were unearthed. Before us are fragments of the pottery, which can be inspected by those feeling a curiosity in the matter. They are composed of a gray substance, and figured with indelible coal-black colors. The figuring is regular, and as plain as the figures on porcelain just taken down from a merchant's shelf. We have not seen any of the stone implements. The curiosities were found on a level formation, about three feet beneath the surface, which undoubtedly had been constructed for a floor. The discoverers were excavating gravel to level up the railroad track when they struck upon the interesting depository. The spot is just beneath an overhanging point of rock, on which have been carved hieroglyphical characters in profusion, the majority having been obliterated by the erosions of time.

Further developments may disclose relics still more interesting.

It would seem that the ingenious race who manufactured these specimens of art should have known something of the immense silver deposits in the hills, at the base of which they had their habitations; but if they were workers in the precious metals the evidences have yet to be discovered.—*Pioche Record*.

GRAVEL DIGGINGS.—Parties in Virginia City are making arrangements to prospect some placer diggings known to them and situated somewhere in the Sierra Nevada Mountains south of Lake Tahoe. They are only waiting for the disappearance of the snow from their claims, when they will commence operations.

Mineral Resources of Costa Rica.

The name of Costa Rica implies wealth. To be entitled to the appellation of rich, a country must have possessed some peculiar advantages, and as at the time when the Spaniards gave the names to the countries they conquered, agriculture was only a secondary consideration; it must have been to its immense mineral resources that the country which now possesses that title owes its distinctive appellation. From the far north to the extreme south, the western coast of America abound in mineral wealth. The chains of mountains, which, in broken ridges follow its course over some great fissure in the earth's crust, are full of them. Metals of different kinds have been projected upwards into the masses of quartzose and basaltic rocks of which they are composed, and intimately mixed with the materials that were ejected at the same time, constitute now the rich lodes which have rendered so many districts famous in mining history. Distant, however, in many cases from the coast and from those modern appliances which speedily make them render up their treasures numberless mines of inestimable value, continue still undeveloped, and nothing often remains to tell of what in bygone times Spanish enterprise attained, but the mere empty name indicating the otherwise forgotten fact. Such is the case with Costa Rica. At the period of its conquest, the Indians possessed the precious metals in abundance, and the Spanish adventurers who subdued the Territory, reaped great spoils from the vanquished. A highly-favored and flourishing agricultural colony speedily sprang up, and this portion of Central America was one of the most promising possessions Spain had in the new world. The danger, however, from the bucaners, the disorganized condition of the mother country, with the consequent court intrigues and the more facile connection of other spots with the old world, together with a variety of conspiring causes, led to its later abandonment, and so great was the apathy of the Government, as also of individuals, that even the very existence of these precious metals which had made it famous was almost forgotten.

Years rolled on. A few Indians and a colonist here and there collected gold. A memory of the past was thus kept alive; but it was not till the end of 1821 that a poor man, called Nicolas Castro, opened the first gold mine since the time of the conquest. The success which attended his operations speedily induced others to follow in his footsteps, and as they were equally fortunate, a mining district sprang into being in a few short months. Since that time gold mining has been pursued in many of the mountainous parts of the Territory of the Republic, but as the means of those engaged in it has been very limited, and their knowledge still more so, the legitimate results have never been arrived at. The rude machines used for stamping, and the inadequate system of amalgamation pursued, entail a loss of more than half the precious metal with a still greater loss of the mercury. Yet even with all these disadvantages, large profits have been made, and large quantities of gold extracted.

Travelers who have visited the country have invariably expressed their surprise that, with rude methods employed, and the careless manipulation of the native miners, such results should have been obtained. They have wondered that, treated as it is, the auriferous quartz could have been made to give up its treasures, and whilst doing so have deplored that European capital, European energy and European skill, should not have been brought to bear on so rich a field instead of being turned to other and less profitable quarters. Nearly fifty years ago it had first attracted their attention, and twenty years later Mr. J. L. Stephens speaks in his work on the country with undisguised admiration of its wonderful richness. The lodes or mineral veins run regularly north and south, in ranges of greenstone porphyry, with strata of basaltic porphyry, and average about three feet in width. M. Peralta, a member of the Geographical Society of France, writing about the resources of Costa Rica in 1871, says—"The mineral deposits from one of the greatest sources of the wealth of Central America and the State of Costa Rica need fear no rivalry in this respect, either with California or New Holland. Gold, silver, copper, iron, nickel, zinc, lead, coal, marble, etc., are to be found in abundance in the bowels of the earth, or in the titanic gorges of the Cordilleras; but up to this time gold, silver and copper are the only ones which have been worked. Amongst the gold mines, those of the Ciruelitas, belonging to Mr. Carlos Giralt, and those which are worked by the Monte Aguacate Company, have given the most satisfactory results. From the above statement it will be acknowledged that Costa Rica—to use the language of M. Kaltrunner—is destined to a brilliant future, and will become one of the great Eldorados of the modern world."

A most important consideration in gold mining, to which the discoverers of new mining regions do not always pay sufficient heed, is the character of the climate of the district in which the mines are situated, combined with the facilities for obtaining an adequate supply of labor. It is in this respect that Costa Rica is as highly favored as she is in the extent and value of her unwrought mineral treasures. The climate in the vicinity of the mines is cool

and healthy all the year round. Labor is abundant and not too costly, the pay of an ordinary workman, including provisions, being 6l. monthly. Moreover, the miners generally work by contract, so that an exact estimate of the work to be performed can easily be made; the usual price per yard in ordinary ground is 24s. Taking all the circumstances into account—such as the proved richness of the Costa Rica mines, the facilities for working them in a manner which will largely increase their productiveness—there is a strong probability of the company which has been formed to work them proving a gratifying success to all concerned. English investors have had warning against trusting implicitly to the statements made with regard to mines in the United States, and it is now no small recommendation of any new mining district that it is entirely removed from the influences which so prejudicially affect American mines.

Unlike the United States of America, Anetolia and Brazil, Costa Rica is almost a virgin field for legitimate European enterprise of this nature. The native miners are unable to avail themselves of the improved machinery and modes of working; which are only attainable by the outlay of a considerable capital and of an experienced organization, and hence they cannot derive the benefit of that extension of which the mines are so fully capable. So great indeed is the scarcity of capital, and so exorbitant the ordinary rate of interest in the country itself, that the execution of all industrial enterprise, and even of public works, involves onerous pecuniary sacrifices.—*Mining World*.

Montana Mining Prospects for 1873.

The mining prospects were never better for a prosperous mining season in Deer Lodge county, says the *Independent*, than at the present time. It is true that the amount of gold taken out will probably be less than that of last year. There will be plenty of water during the season—the deep, solidly packed snow on the mountains insures this—and, as a general thing, the mines will average about the same as last year. Therefore the prospects for the mining community are very good. Laborers will also find profitable employment in the mines and on ranches, as there will be a general scarcity of laborers of all kinds, and next fall will find miners and laborers better off than ever before at the close of a mining season. The cost of living is now so much reduced that a laborer at \$5 per day can save as much money per month now as he could when he was receiving \$7 per day for his labor. In fact the great reduction that has been made in the price of water, mining tools, labor, etc., justifies mine owners in working ground with profit that would not pay heretofore. It is claimed by men well posted in such matters that there are acres of ground in this county that will pay good wages, now that prices have been reduced. Laborers in Montana can get plenty of work and good pay; we know of no country where the supply of labor is not greater than the demand. In Montana it is the reverse. The demand during the summer months will be far greater than the supply. Many mines will go unworked and many ranches untill in consequence of the scarcity of labor.

OPAL DEPOSITS.—The *San Diego Union* makes the following statement:

Some time ago a man named Williams brought in town a number of rough opals which he professed to have found in the vicinity of the city. Two of these stones he left with Mr. R. R. Morrison, jeweler, to have cut; one of the two opals Mr. Morrison valued at about \$150, the other at \$100. Williams had a number of other opals in his possession which he refused to dispose of and took away with him to Texas, for which State he left shortly after leaving the two specimens with Mr. Morrison. He refused to divulge the whereabouts of the deposit, but alleged that there were plenty more in the same place where he found the specimens he had obtained and exhibited. Since then Mr. Morrison has carefully explored those localities in the vicinity of the city giving indications of the presence of opals. He states that he believes he has discovered the deposit, but is not at present prepared to make any revelation concerning its whereabouts or to take any steps toward securing the ground, as the land is in litigation, being covered by a disputed Spanish grant, and having about half a dozen claimants. He believes the deposit to be rich and extensive.

GREAT GYPSUM DISCOVERY.—About seventy-five miles south of Pioche, says the *Record* of March 19th, a discovery has been made of immense deposits of pure gypsum. They were found a few days ago, by Joseph Mayott, of this city. A fine specimen from the deposits is now before us. It is a white laminated mass, with satin lustre. Pure gypsum, such as we take the specimen before us to be, carries nearly fifty per cent. of sulphuric acid, the balance of its substance being lime and water, the former predominating. It is of volcanic origin, being the product of sulphur gases escaping and the line of decomposing lavas. In the Mammoth Cave, in Kentucky, gypsum is found in the form of rosettes or flowers, vines or shrubbery. Burned and ground it forms plaster of Paris. We cannot see any immediate source of wealth in these Lincoln county deposits; in the future, however, they may become valuable.

SCIENTIFIC PROGRESS.

Curious Effect of Light on Selenium.

Selenium is a substance that resembles and is allied to sulphur. It is found in connection with some natural deposits of sulphur, but it more commonly occurs in combination with metals, forming selenides. Selenium is less combustible than sulphur, burns with a blue flame, and emits a putrid horse-radish odor.

Mr. Willoughby Smith has been making a series of electrical experiments with selenium, and, at a recent meeting of the Society of Telegraph Engineers, London, he made known the following results:

The sticks of selenium were connected with platinum wire and hermetically sealed in glass tubes. The electrical resistance of some of the sticks was very great, others much less, and he was at loss to account for this lack of constancy, until, after various trials, he found that it was due to the action of light. When the sticks of selenium were shut up in a box as to exclude light, the electrical resistance was highest and remained constant; but when the cover was withdrawn and light was allowed to fall on the sticks, the electrical resistance diminished 15 to 100 per cent., according to the intensity of the light. The shading of the selenium by means of glass plates of different colors showed that the conductivity was altered in proportion to the interception of the light. These are very singular observations, and may lead to new and useful discoveries concerning the qualities of other substances, and the manner in which light and electricity affect them.

REMARKABLE TELEGRAPHIC FEAT.—Capt. J. H. Hills, a Vermont telegraphic operator, being recently on a snow-bound train where severe suffering was anticipated, without speedy relief, cut the telegraphic wires, took their ends into a car where they would be sufficiently warmed to admit of being readily handled, and by sticking the ends together was able to "call" the operator at one of the principal stations on the road. He then sent the following message:—"Trouble. Answer slowly. I am working without an instrument; I will receive your answer through my tongue."

Captain H. received the answer by putting one end of the wire above and the other under his tongue, and letting the electric current pass through it, when he was able to read by the succession of sharp and somewhat painful electrical shocks. His success was perfect, and he not only sent and received messages for the conductor, but for several of the passengers. The only ill consequences of the exploit was the total loss of taste which Captain H. suffered for several days afterwards.

UNCONTROLLABLE FIRES.—Much has been said since the great fires in Chicago and Boston, about the uncontrollable nature of great fires. A correspondent of the *Scientific American* suggests the following as, at best in part, accounting for the special phenomena attending such great conflagrations:—

"When steam is heated to 5072° Fahr., it is decomposed into a mixture of oxygen and hydrogen gases, and about 8,000 units of heat are made latent; and when the gases again unite, which they will do when cooled by contact with colder substances down to a point below 5072°, the 8,000 units of heat will again become sensible, the process being analogous to that by which 962 units of heat are made latent when water is evaporated, the same amount of heat being again made sensible when the steam is condensed.

In great fires there is always a great quantity of water in the burning materials, and the heat is doubtless above 5072°. The result would be that the mixed gases would be driven out of the fire and would recombine as soon as sufficiently cooled, exposing any building or other object upon which they might strike to the heat of an oxyhydrogen flame."

THE "NORTHERN LIGHTS" REFERRED TO ELECTRICITY.—As further evidence that the auroral display may be referred to atmospheric electricity the following telegraph experience is given:—Capt. Hillaan operator at Burlington, Vt., having found great difficulty, on a certain occasion, when the "Northern Lights" were unusually brilliant, in receiving his dispatches from New York, attributing the interruptions to atmospheric influences, disconnected his telegraphic batteries, and requested the New York operator to do the same, when he found a much more even current, and worked some time with the atmospheric current alone, without any connection or assistance from the batteries. As soon as the auroral display materially diminished, the atmospheric current also diminished, and he returned to the use of the regular batteries without further interruption; thus plainly establishing a direct relation of cause and effect between the aurora and the electrical conditions of the atmosphere.

OXIDATION OF ALCOHOL.—On shaking absolute alcohol in a flask of ozonized oxygen, for a few seconds, the alcohol becomes acid and acquires the odor of aldehyde. The irritating (oxidizing) action of ozone is very much greater than that of oxygen.

NECESSITY OF REST FOR PLANTS.—Those who carefully watch the influence of spring upon vegetation, will find that it means something more than the mere action of light and heat upon certain chemicals. Thus, a glass jar, placed in the window of a room that has been kept constantly warm, contained several small water plants which have lain dormant all winter, although the heat and light seemed to be abundant. Now, however, that spring has come, they are all starting up vigorously. We know that even in the depth of winter, flowers and fruit may be grown, if freely supplied with light and heat; but it would seem that in spring these agents, even though apparently not more intense, are much more efficient than in winter, and it is probable that much of this increased efficiency is due to powers inherent in the plants themselves; but which require periodical seasons of diet in order to develop their full influence upon the organism of the plant.

MINUTENESS OF SPECTROSCOPIC RESEARCH.—Our readers have already been made acquainted with the fact that the spectrum is capable of discovering the presence of the most minute quantities of any mineral or gas, the light of which may be submitted to its analysis by means of vaporization; but we presume they are hardly prepared for the announcement that it is also almost or quite as effective in detecting the presence of infinitesimal quantities of dark substances, by the absorption, rather than the inversion of their light. It is thus that foreign substances, such as deleterious gases, etc., are detected in blood. Dr. H. Rath says that it is thus perfectly easy to detect and ocularly examine the human blood in the stomach of a flea. This same may even be diluted with a teaspoonful of water without losing its property as human blood, if the insect has recently been dining from the person of a human.

HEAT AND DENSITY.—It is generally supposed that the softening action of heat is due to the fact that it forces the atoms of matter apart, and prevents that close adhesion which exists when the mass is cold. Thus red-hot iron is soft and easily moulded by blows, because the heat expands the metal, and thereby weakens the force with which the particles adhere. We might, therefore, suppose that the more dense any given material could be made, the harder it would be; but a singular instance, in which the facts are exactly the reverse of this, occurs in the case of steel, which, though quite hard when tempered, has less density than when nitempered. The truth is that many very plausible explanations are only so in appearance, and would be discarded, if we knew all the facts in the case.

NEW METHOD OF CLEANING GLASSWARE.—Dr. Walz sends the *Scientific American* the following description of his new method of cleaning glassware. The vessel to be cleaned is filled, or, if large, rinsed with a moderately dilute solution of potassium permanganate, the contact of the liquid being prolonged till a film of hydrated manganic oxide has been deposited; the solution is then poured away, and the glass vessel rinsed with strong hydrochloric acid. Chlorine is then formed, but not enough to cause inconvenience; and acting in the nascent state on the organic matters, it speedily converts them into substitution products, which are soluble in the slight excess of acid or water.

RESEARCHES ON THE ALCOHOLIC FERMENTATION.—Dumas in a long article in *Comptes Rendus*, concludes that neither the view of Liebig, that fermentation is due to "influence," nor that of Berzelius, that it is due to "contact," is correct. He regards it as a chemical change, caused by the vital force of the yeast. "If I consider the alcoholic fermentation as a chemical fact capable of measurement and of modification by chemical forces and agents, I do not the less recognize its direct and constant dependence upon the presence, the action, or, in a word, the life, of the cells of the yeast."

ABSORPTION BY PHOSPHORUS.—Red amorphous phosphorus, under the influence of solar heat, as does charcoal, has the property of absorbing many substances without acting chemically upon them, as rosaniline, iodine, sulphur. Pulverized phosphorus agitated in a solution of iodine in bisulphate of carbon or rosaniline in alcohol, absorbs the iodine or the rosaniline, leaving the solution colorless. These facts are published as the result of the labors of M. Testini.

BLEACHING BY TURPENTINE.—It is well known that turpentine generates ozone, and the fact has been used for bleaching purposes. The turpentine is violently whipped by dashers and the ozone is blown from the generator into the vat containing the paper stock or other goods to be bleached. How far this operation is successful we do not know, and only throw out the suggestion for some one to give it a trial and report the result.

THE MILLION DOLLAR TELESCOPE.—The project of getting up a great million dollar telescope, by private subscription, bids fair to be realized. We presume that Government will come to the aid, if necessary, in furnishing the last stipend that may be necessary to secure the construction of such an instrument. If possible, it should be completed and mounted at Philadelphia, ready for use at the coming Centennial Celebration.

IMPROVEMENT IN THE MANUFACTURE OF GLUCOSE.—It has been discovered by Mr. Krothe, that by adding a small quantity of nitric acid to the sulphuric acid, in converting starch into syrup, (glucose) he is able to save half the time required for affecting the conversion by the use of sulphuric acid alone. In preparing solid glucose the saving of time is much greater. The manufacture of solid glucose (grape sugar) has largely increased of late.

MECHANICAL PROGRESS.

Tempering Steel.

One of the most promising, profitable, and apparently excellent of these patented processes is that of Garman & Siegfried, owned by the Steel Refining and Tempering Company, Boston, Mass. Congress has appropriated ten thousand dollars to pay for the right of use in the government shops. It is said to impart an extraordinary hardness and durability to the poorest qualities of steel. The following description of the process is from Siegfried's specification, patent of July 16, 1871:

"I first heat the steel to a cherry red in a clean smith's fire, and then cover the steel with chloride of sodium (common salt), purifying the fire also by throwing in salt. I work the steel in this condition and while subjected to this treatment, until it is brought into nearly its finished form. I then substitute for the salt a compound composed of the following ingredients and in about the following proportions: One part, by weight, of each of the following substances: chloride of sodium, sulphate of copper, sal ammoniac, and sal soda, together with one-half part by weight of pure nitrate of potassa, said ingredients being pulverized and mixed. I alternately heat the steel and treat it by covering with this mixture and hammering until it is thoroughly refined and brought into its finished form. I then return it to the fire and heat it slowly to a cherry red, and then plunge it into a bath composed of the following ingredients in substantially the following proportions for the required quantity: of rain water, one gallon; of alum, one ounce and a half; of sal soda, one ounce and a half; of sulphate of copper, one ounce and a half; of nitrate of potassa, one ounce; and of chloride of sodium, six ounces. These quantities and proportions are stated as being what I regard as practically the best, but it is manifest that they may be slightly changed without departing from the principle of my invention."

TUNGSTEN STEEL.—Some experiments are described which do not tell as much in favor of this tungsten steel (Mushet's special steel) as those we have previously noted from time to time. A sample of the steel was prepared precisely in accordance with Mushet's process, and with all necessary precautions, but it was found that it would not bear forging at all well. A chisel made from it would not bear the blows of the hammer, and broke up into splinters. A knife which was forged for a planing machine did not stand nearly as well as a cast steel knife of exactly the same pattern. The tungsten steel appears to possess great hardness, with a fine scaly fracture, but is far too brittle for ordinary uses. These remarks are in almost direct opposition to those of Professor Heeron, who speaks very highly of the value of this steel for planing machines. Analysis of the two samples showed a certain difference in composition between that used by Heeron and that by Kick: the former containing 8.3 per cent. of tungsten and 1.73 of manganese; whereas the latter gave the mean values—Iron, 87.52 per cent.; manganese, 2.33; tungsten, 8.78; silicon, 0.76; phosphorus, 0.01; sulphur, 0.21; carbon, 0.41 per cent.; titanium, a trace. Total, 100.03.

NEW METHOD OF PLATING.—A very interesting invention, lately developed by Mr. Brownell, of Hartford, relates to the plating of metals with nickel, gold or silver. He puts a thin plating of nickel or gold or silver to other metals, and then melts it in, so that, while the surface is of the color and character of the plating, the latter so permeates the main metal that it neither scales nor wears off. Nickel applied to the linings of boilers, to the sheathing of ships, to the coating inside and out of gun and pistol barrels, prevents oxidation, lime incrustations, or any detrimental soiling, while it keeps the surface smooth, clear and bright. The expense of this method of plating is only a quarter of one per cent. additional; and if, as seems quite certain, it proves practicable on a large scale, this mode of coating coarser metals with finer will find new and larger applications.

NEW PREPARATION OF PAPER AS A BUILDING-MATERIAL.—An English company prepare a water-proof material out of paper-pulp, or any fibrous substance, by saturating it with ammoniated copper solution—a digest of copper scrap in concentrated ammonia. This treatment dissolves the fibres and renders the paper impervious to water. A number of sheets of paper are maintained on the surface, placed on each other, and thoroughly pressed. They thus are made to adhere firmly together, and are then fashioned into the various forms required. The product may replace corrugated iron for roofing, or it may be made into columns and flutings for internal decoration. It is said to be a very durable material even when exposed to air and rain.

A Lesson in Friction.

The following facts teach a lesson which shows how important it is that the utmost care and caution should be observed in relation to everything where human life and safety is involved:—The steamship *Saragossa* was lately put upon the ways at Baltimore, supposed to need only new caulking and copper. The caulkers got to work, and the seams between the planks were dressed out with the irons preparatory to driving in the new oakum. Imagine the astonishment of the caulkers when one day the iron, subjected only to a feeble blow, went clear into the vessel. A closer inspection resulted, and it was discovered that for a distance of eighty feet on each side of the keel, and beneath that portion of the ship where the boilers rest, planks which eight years ago were three and one-half inches thick were now mere boards and one-half inch in thickness. They were not worn-eaten, and to all appearances were as sound as when first spiked and bolted to the huge skeleton of the ship. And here is a lesson in the power of friction which is aptly illustrated. Beneath the boilers of the *Saragossa* it was discovered that particles of coal had dropped from time to time, and the mere motion of the vessel as she rocked at sea had shaken the loose pieces of mineral from side to side on the planks, and worn them to the thickness of boards used in the ordinary skiff, such as are used in our creeks.

MICA HEAD LIGHTS FOR LOCOMOTIVES.—The introduction of silvered mica reflectors into locomotive head-lights has proved a complete success. An engineer on the West Jersey railroad, who has been using them, says he can by their aid distinguish the features of a person at a distance of four hundred yards. They are now being tested on the Reading, North Pennsylvania, and other railways, with the most encouraging prospects as to their adoption on account of their economy, durability, efficiency and saving of labor. In case of accident they are but little liable to injury. A case is mentioned of a locomotive on the North Pennsylvania railroad, which recently exploded, and the smoke stack of the locomotive fell heavily on the lantern, completely demolishing it and sending the reflector almost double, when relieved of the pressure, it sprung back to its shape, and with the exception of the displacement of one or two small pieces of the silvered mica, it was uninjured; whereas had it been a metal reflector it would have required replating and bending, involving an expense of at least twenty dollars.

Why might not these reflectors be advantageously introduced in our hydraulic mines?

MECHANICAL WOOL CARVING.—Mechanical appliances for facilitating the carver's art are occupying much attention just now. Charring the depressions by passing blocks of wood underneath a heated roller so as to leave the unburned portions in relief, from which electro-types may be taken for printing, and the sandblast process are among the latest inventions in this direction.

And now we have a device by H. A. Lantaigne, of pans, which is highly spoken of by the European press. The wood, in this process, is passed between a bed-plate and a matrix cylinder, on the surface of which the design has been cut, so that it is pressed into the wood. The ease of this cheaply producing ornamental woodwork is apparent, and the invention has been pronounced by some, as one of the most valuable industrial products of the last ten years.

COKE FROM LIGNITE.—Mr. Henry Englemann, who has been experimenting largely with Wyoming coal, reports that he finds a good coke can be produced from it. His experiments have been made with a furnace capable of receiving half a ton charge. The interesting point in these experiments is the fact of obtaining a good coke from a coal that is regarded as an undoubted lignite—though a lignite of superior quality. If the experiments of Mr. E. are reliable, and capable of being made economically practical, the discovery will be of much value to many mechanics and many interests of that section of the country.

HARDENING BURNED STEEL.—For hardening the steel points of tools of boring machines, etc., when burnt, J. Jossi proposes the following method: 10 parts of tallow, 2 parts horn filings, 1 part sal ammoniac, 1 part pulverized charcoal, and 1 part soda are mixed together and placed with a piece of wood on the parts to be hardened, after they have been exposed to a cherry-red heat. The mixture dries under the influence of the heat, and the steel parts may be hardened again in the usual manner.

COMPLIMENT TO AMERICAN MECHANICS.—A recent English work on the strength of materials and structures contains a valuable series of tables, derived chiefly from experiments made at the British national engineering establishments at Chatham and Woolwich, by means of a simple and efficient machine for testing strength and elasticity, of American origin. This is a high compliment to the ingenuity of American mechanics.

A NEW PLATING PROCESS.—A gentleman at Hartford, Conn., has invented a new process of plating iron or any composition metal either with gold, silver, or nickel, the plating being so driven into the surface that it becomes a part of the metal itself. Experiments have been made on boiler iron at Colt's factory, with perfect success, and the Government is going to test the merits of the invention.

Assessments, Meetings, Dividends.

NOTE.—In the Stock Boards an assessment is delinquent thirty days from the date of levy, exclusive of that date. The dates given in this list are those of the mining offices.

ASSESSMENTS.—Stocks on the Lists of the Boards.

Company.	Location.	No.	Amt.	Levied.	Delin'g't.	Sale.	Secretary.	Place of Business.
Alps S. M. Co.	Ely Distri- t.	3	50	Feb. 14	Mar. 24	Apr. 15	C. S. Neal.	402 Montgomery st.
Arizona & Utah.	Washoe.	4	\$100	Feb. 15	Mar. 21	Apr. 13	J. Maguire.	419 California st.
Bainmore Con. M. Co.	Nevada.	2	75	Mar. 31	May 6	May 29	D. T. Bagley.	401 California st.
Ca. veras G. Al. Co.	Ely Distri- t.	3	25	Feb. 12	Mar. 18	Apr. 8	B. E. Vinyard.	418 California st.
California & Nev.	Nevada.	1	100	Feb. 12	Mar. 18	Apr. 10	W. C. Bagley.	416 California st.
Charter Oak S. M. Co.	Nevada.	1	25	Mar. 3	Apr. 9	Apr. 10	G. W. K. King.	411 California st.
Chandler-Potter M. Co.	Washoe.	4	500	Feb. 13	Mar. 19	Apr. 10	W. E. Dean.	419 California st.
Condorco Silver M. Co.	Nevada.	10	100	Mar. 18	Apr. 22	May 13	R. W. Mesher.	414 California st.
Columbia & S. M. Co.	Ely Distri- t.	3	100	Feb. 12	Mar. 18	Apr. 10	G. W. K. King.	416 California st.
Golden Charter Mining Co.	Idaho.	8	250	Mar. 15	Apr. 25	May 13	L. Kap. an.	Mechanics' Bldg.
Gentle & Curry S. M. Co.	Washoe.	16	100	Feb. 10	Mar. 17	Apr. 1	A. A. Furrow.	Merchants' Ex- change Bldg.
Harper & M. Co.	Ely Distri- t.	3	100	Jan. 27	Apr. 31	Apr. 28	J. R. White.	306 Montgomery st.
Idaho & S. M. Co.	Ely Distri- t.	5	100	Feb. 11	Mar. 19	Apr. 15	A. E. Chant.	419 California st.
Idaho & S. M. Co.	Idaho.	9	250	Mar. 25	Apr. 25	May 20	Wm. Willis.	419 California st.
Independence Gold Mining Co.	Cal.	3	40	Apr. 2	May 7	May 25	G. T. Grice.	210 Montgomery st.
Imperial S. M. Co.	Ely Distri- t.	5	100	Mar. 14	Apr. 28	Apr. 16	C. S. Neal.	402 Montgomery st.
Johnson & Nelson Co.	Nevada.	13	150	Mar. 14	Apr. 17	May 6	A. Noel.	419 California st.
Julia G. & S. M. Co.	Washoe.	4	150	Feb. 18	Mar. 25	Apr. 15	K. W. Kenner.	414 California st.
Kearney & S. M. Co.	Ely Distri- t.	4	100	Feb. 11	Mar. 17	Apr. 15	L. P. Cavalier.	309 Cal. com. st.
Kriegerbocker M. Co.	Nevada.	5	100	Mar. 24	Apr. 26	May 16	H. B. Le.	Stevens' Bldg.
McMahon M. Co.	Schell Creek.	3	25	Feb. 24	Mar. 28	Apr. 23	G. K. Spence.	320 California st.
Mahogany & S. M. Co.	Idaho.	8	250	Apr. 31	May 10	May 31	E. McFadden.	1 Ebbetts Bldg.
Mannett S. M. Co.	White Plu- t.	10	100	Mar. 3	Apr. 5	Apr. 23	J. L. King.	411 California st.
Minnetaka.	Idaho.	5	100	Mar. 21	Apr. 25	May 15	Wm. Willis.	419 California st.
New York Con. M. Co.	Nevada.	3	50	Mar. 4	Apr. 25	May 10	H. C. Kirby.	419 California st.
Occidental M. Co.	Storey Co. Nev.	1	75	Feb. 8	Mar. 17	Apr. 7	C. E. Kinot.	419 California st.
Overman & S. M. Co.	Nevada.	5	50	Mar. 27	Apr. 30	May 1	C. E. Kinot.	Montgomery st.
Overman Silver M. Co.	Nevada.	25	50	Mar. 18	Apr. 19	May 7	W. W. Stetson.	41 California st.
Pietou M. Co.	Washoe.	2	20	Feb. 14	Mar. 23	Apr. 18	S. Phillips.	415 Montgomery st.
Pieche S. M. Co.	Ely Distri- t.	3	100	Feb. 21	Mar. 25	Apr. 24	E. Elliot.	419 California st.
Pine Bluffs & M. Co.	Nevada.	1	50	Mar. 12	Apr. 12	May 3	J. W. Jones.	115 California st.
Seimur S. M. Co.	Nevada.	7	50	Feb. 11	Apr. 18	Apr. 7	Henry Bo. le.	10 Stevens' Bldg.
Silver Wave M. Co.	Nevada.	10	60	Jan. 29	Mar. 14	Apr. 8	J. W. Clark.	418 California st.
South Charlot. M. Co.	Idaho.	9	50	Feb. 15	Mar. 22	Apr. 8	J. L. King.	411 California st.
Union & Nevada Mining Co.	Idaho.	20	100	Mar. 15	Apr. 20	May 1	J. F. Hamilton.	37 Montgomery st.
Utahcom G. & S. C. & C. Co.	Cal.	19	25	Feb. 24	Mar. 31	Apr. 23	J. F. Hermann.	318 Kearney st.
Union Con.	Nevada.	2	25	Mar. 18	Apr. 21	May 2	J. F. Williamson.	Merchants' Ex- change Bldg.
Washington & Creole M. Co.	Ely Distri- t.	7	50	Jan. 22	Mar. 6	Apr. 3	F. D. Cleary.	419 California st.

Alhambra M. Co.	Nevada	14	1 50	Mar. 25	Apr. 26	May 20	J. O. Straneh.	1210 Front st.
Ansel's Q. M. Co.	Cal.	1	1 20	Mar. 4	Apr. 5	Apr. 21	Geo. Congdon.	408 California st.
Archer & Co.	Placer Co.	Cal.	1	1 20	Mar. 4	Mar. 11	W. B. Jr.	408 California st.
Atlantic and Pacific Con. G. M. Co.	Cal.	3	6	Feb. 25	Apr. 5	Apr. 19	A. Noel.	419 C. l. lorna st.
Auburn G. M. Co.	Cal.	3	50	Feb. 12	Mar. 18	May 8	K. Wegner.	414 California st.
Brown Mining Co.	Grass Valley	Cal.	1	1 20	Mar. 18	May 19	J. M. Cunningham.	Merchants' Ex.
California Fl. at North Ex. Co.	Cal.	2	10	Feb. 4	Mar. 17	May 26	566	213 California st.
Continental M. Co.	White Pine	3	50	Feb. 7	Mar. 15	Apr. 7	H. H. Blake.	302 Montgomery st.
Eagle Q. M. Co.	Santa Barbara	Cal.	1	50	Mar. 18	Apr. 24	23	Win. H. Watson.
Elmer & Co.	Cal.	19	1 20	Mar. 18	Apr. 26	May 1	M. M. Mough.	302 Montgomery st.
Ela Buena Con. S. M. Co.	Nevada	2	25	Mar. 27	Apr. 16	May 24	A. Noel.	419 C. l. lorna st.
Excelior Gravel M. Co.	Cal.	1	50	Feb. 14	Mar. 22	Apr. 10	J. W. Van Winkle.	381 California st.
Gold Run M. Co.	California	1	10	Mar. 15	Apr. 19	May 6	C. L. Palmer.	Cr. Market & Spear st.
Grass Valley & W. M. Co.	Grass Valley	5	7	Mar. 15	Apr. 19	May 6	C. L. Palmer.	Cr. Market & Spear st.
Graham & Bishop S. M. Co.	Ely District.	1	15	Feb. 21	Mar. 26	Apr. 18	S. Phillips.	415 Montgomery st.
Great Blue Gravel Range Co.	Cal.	2	5	Mar. 25	Apr. 26	May 19	Win. H. Watson.	382 Montgomery st.
Hardy Coal Mining Co.	White Pine	1	1 00	Mar. 26	May 1	May 21	James Hardy.	338 Montgomery st.
Hart & Co.	Cal.	1	50	Mar. 26	Apr. 18	May 18	T. L. Ward.	332 Montgomery st.
Homogoria Mining Co.	Lower Cal.	7	3 00	Mar. 7	Apr. 14	May 5	J. H. Applegate.	712 Montgomery st.
Imperial-Eugene G. M. Co.	Cal.	1	5	Feb. 15	Mar. 22	Apr. 22	Gustave Benson.	124 W. 14th St.
Josephine Quicksilver M. Co.	Cal.	8	20	Feb. 29	Mar. 31	Apr. 18	C. S. Sanoke.	305 S. omc st.
Kearney & Co.	Nev.	4	20	Mar. 1	Mar. 15	Apr. 18	C. S. Sanoke.	305 S. omc st.
Keystone No. One and Two G. & S. M. Co.	Cal.	1	23	Mar. 10	Apr. 15	May 5	T. E. Jewell.	507 Montgomery st.
Lady Emma M. Co.	El Dorado Co.	2	15	Feb. 28	Mar. 29	Apr. 21	A. D. Carpenter.	605 Clay st.
Lady Franklin M. & S. M. Co.	Cal.	1	50	Feb. 12	Mar. 23	Apr. 21	S. J. Lucy.	5 7 Montgomery st.
Lady Robert Tunnel and M. Co.	Utah	1	10	Mar. 17	Apr. 7	May 8	Chas. S. Grey.	35 Ave. Merchant's Ex.
Leon M. & M. Co.	Cal.	1	1 00	Feb. 12	Mar. 15	Apr. 5	I. T. Millikin.	408 Merchant st.
Minhat an G. & S. M. Co.	Nev. Co.	Cal.	14	23	Mar. 12	Apr. 11	A. H. Bandy.	Ones Valley
Minister & Co.	Cal.	1	25	Feb. 17	Mar. 25	Apr. 14	Wm. Smith.	331 Kearny st.
Mitchell & Co.	Nye Co.	Cal.	2	25	Feb. 10	Mar. 14	Geo. L. Davis.	314 California st.
Newton Booth Con. Co.	Ely District.	4	25	Feb. 10	Mar. 22	Apr. 14	J. F. Strling.	314 California st.
Ogden G. & S. M. Co.	White Pine	2	10	Apr. 1	May 10	June 5	J. A. McClelland.	414 California st.
Ohio Con. G. & S. M. Co.	California	1	10	Apr. 1	May 10	June 5	W. A. Knapp.	452 Montgomery st.
Orchard & Co.	Cal.	1	10	Apr. 7	May 10	June 5	W. A. Knapp.	452 Montgomery st.
Quincy Champion Co.	Ely.	1	10	Apr. 7	May 10	June 5	W. A. Knapp.	452 Montgomery st.
Placer G. M. & A. G. Co.	Cal.	3	10	Feb. 6	Mar. 17	Apr. 7	G. W. R. King.	411 California st.
Prospect Mining Co.	Grass Valley	1	1	Feb. 15	Mar. 20	Apr. 7	P. H. Fayner.	Grass Valley
Quicksilver & Co.	Grass Valley	1	1	Feb. 15	Mar. 20	Apr. 7	P. H. Fayner.	Grass Valley
Samerson G. M. Co.	Cal.	3	15	Feb. 14	Mar. 17	Apr. 7	Wm. Strater.	418 California st.
San Joaquin M. Co.	Ely District.	1	10	Feb. 14	Mar. 17	Apr. 7	J. H. Applegate.	729 Montgomery st.
Schuykill Quar. 2 Mining Co.	G. Valley.	18	5	Mar. 15	Apr. 19	May 7	W. L. Reed.	Grass Valley
Shasta Con. G. & S. M. Co.	Cal.	1	5	Mar. 15	Apr. 19	May 7	W. L. Reed.	Grass Valley
South Mountain Smelting Co.	Idaho.	1	3 00	Feb. 11	Mar. 17	Apr. 17	C. S. Leonard.	Silver City, I. T.
Starr King S. M. Co.	Nevada.	2	25	Mar. 27	May 1	May 20	L. Kaplan.	Merchants' Ex.
Summit M. Co.	Amador Co.	Cal.	1	25	Feb. 8	Mar. 14	Geo. Davidson.	734 Montgomery st.
Tahoe Ice Company.	Ely District.	2	25	Mar. 27	May 1	May 20	L. Kaplan.	734 Montgomery st.
Table Mountain Blue Gravel M. Co.	Cal.	1	25	Jan. 30	Mar. 17	Apr. 10	W. L. Ustick.	438 California st.
Table Mountain Alpha M. Co.	Cal							

MEETINGS TO BE HELD.

Name of Co.	Location.	Secretary.	Office in S. F.	Meeting.	Date.
Arizona and Utah Mining Co.	Nevada.	Joseph Almagiro.	419 California st.	Annual	Apr. 14.
Cedarberg Flint N. Ext.	Cal.	H. M. Webster.	536 Montgomery st.	Special	Apr. 14.
California Shaving and M. Co.	Nevada.	W. J. Whip.	419 California st.	Annual	Apr. 30.
Eureka Coal Co.	Cal.	H. F. Williams.	321 Montgomery st.	Annual	Apr. 3.
General Lee.	White Plac.	J. F. Schulze.	424 Montgomery st.	Speciml	Apr. 27.
Honolulu M. Co.	Lower Cal.	J. H. Galtman St. J.	407 Montgomery st.	Annual	Apr. 27.
Joseline G. M. Co.	Cal.	G. Starcke.	374 Sansome street.	Annual	Apr. 7.
Keystone No. One & Two G. & S. M. Co.	Cal.	T. E. Jewell.	501 M. akumery st.	Annual	Apr. 14.
Ledy Washington M. Co.	Cal.	W. J. Smith.	412 1/2 California St.	Annual	Apr. 14.
Lucas Grant.	Cal.	W. J. Smith.	331 Montgomery st.	Annual	Apr. 17.
Omega Table Mountain M. Co.	Cal.	David Wadler.	22 Mechanics' Bz.	Special	Apr. 8.
Sutro Tunnel Co.	Nevada.	P. W. Ames.	321 California St.	Annual	Apr. 3.
Sutro Tunnel Co.	Cal.	Nathaniel Page.	536 Montgomery st.	Annual	Apr. 3.
Pacific A-beetos M. and M. Co.	Cal.	H. B. Congdon.	536 Monty. mery st.	Special	Apr. 17.
Phoenix Silver Mining Co.	Nevada.	Joseph M. guire.	419 California st.	Annual	Apr. 7.

Name of Co.	Location.	Secretary.	Office in S. F.	Amount.	Payable.
Belcher M. Co.	Washeba.	H. O. Kibbe.	419 California St.	4 00	Mar. 10
Black Diamond Coal Co.	California.	P. B. Cornwall.	Cr. Harrison & Spear.	24 per cent.	Mar. 10
Cederberg & M. Co.	California.	D. M. Boker.	420 Montgomery St.	50c	Feb. 8
Chas. J. Alexander & Co.	Cal.	F. B. Ingerson.	402 Montgomery St.	1 00	Aug. 1
Crown Point & S. M. Co.	Washeba.	C. E. Elliot.	419 California St.	3 00	Mar. 12
Diana M. Co.		N. C. Fa-set.	729 Clay St.	1 00	Jan. 20
Eastport Coos Bay Coal.	Oregon.	J. L. Fook.	Merchants' Ex.	1 00	Mar. 10
Kauka G. M. Co.	Gracie Valley.	R. Wegener.	414 California St.	50c	Mar. 7
Malogany O. & S. M. Co.	Idaho.	T. J. Owens.	402 Montgomery St.	1 50	Aug. 7
Meadow Valley M. Co.	Ely District.	W. W. Colburn.	409 California St.	1 00	Jan. 15
Montrose Estate M. Co.		H. B. Minor.	411 1/2 California St.	1 00	Mar. 15
Phoebe S. M. Co.	Ely Dist. Nev.	C. E. Elliot.	419 California St.	A. ag. 19.	Nov. 11
Providence G. & S. M. Co.		A. M. Buntington.	Merchants' Ex.	1 00	Nov. 11
Raymond & Ely M. Co.	Ely Dist. Nev.	J. J. Moulder.	419 California St.	5 00	Feb. 10

Chief East Extension.
Dispatch of the 31st says the ledge in the

latter part of this week we intend to cross-cut east from the extreme northern and southern ends of the north and south drifts on this level.

The ore worked in the west vein, immediately adjoining and north of the incline, has now widened out to 11 feet as we have raised upon it. The length of this body, as far as worked, appears to be about 25 feet. The opening in the engine winze, at the 11th station, shows a breast of ore 11 feet wide to the north, and to the southward of winze it has narrowed down to two feet in width. This ore is of good quality.

Huhn & Hunt.

Dispatch of the 31st says the pulp assays for the last two days run from \$33 to \$109 per ton. Will commence shipping bullion on Tuesday.

Imperial.

Letter of the 31st says the winze known as the Empire looks unusually well to day; no change elsewhere. Expect to make a connection with the north drift of the Yellow Jacket to night.

New York Con.

Letter of the 1st says the ledge is getting larger, and now covers about two-thirds of the bottom of the shaft and is not through yet. It dips to the east, and runs nearly north and south. Are in about three feet on one side. Sink the shaft 27 feet during last month. The rock is soft but has a little more water. Assays to-day give \$1.40.

Noonday.

The quality and quantity of ore have improved considerably since last report. Have run the drift about 6 feet since turning the direction to the east. The whole space of the drift is now in ore, and the proportion of first-class has largely increased.

Overman.

No change during the past week. The faces of the drifts are in about the same kind of rock, with the exception of the north drift, which has more quartz making in, and the ground is considerably softer. Have made 24½ in west drift, 23 feet in north drift, and 24 feet in south drift during the week. Since starting the blower the air has been good in all the drifts, and much better progress will be made in developing the 1,000 foot level. The water in the shaft and drifts is decreasing slowly.

O. H. Treasure.

Letter of the 27th says the incline shaft is down 208 feet, which makes the total distance from the surface 300 feet. Have started a drift at this point to run south on the foot wall, which will prospect the ground to the south line of the claim. At the Wheeler have suspended work on the south drift, and started north on the slip. This will prospect the ground toward the incline shaft at a depth of 500 feet from the surface.

Ophir.

Letter of the 27th says that the east crosscut from upraise, north mine, first station, is getting no harder ground and little progress is being made. The water is gradually decreasing. Winze, south mine, second station, shows an improvement, more quartz than usual being in sight. The north drift 1300-foot level, is going ahead well, but without any material change. There is no change to note in lower level.

Letter of the first says east crosscut from the upraise, south mine, first station, after passing through 40 feet of mixed ledge matter, is in hard porphyry, which they think will prove to be the east wall. A new body of quartz has been uncovered on the east side of the main south drift, second station, about 130 feet south of main north drift, which promises well, although the assays are low as yet.

Pioche.

Letter of the 24th says they received the final clean-up from the Magnet mill yesterday. Will have about \$4,000 from 54 tons of ore. Have the best of the ore on the dumps.

Letter of the 26th says the amount of bullion received from the Magnet mill for 54 tons 1,350 pounds of ore is \$3,814.75, about an average of \$70 per ton. Pulp assay \$121.17. The Floral mill will probably start this week. Car samples for the 24th, \$169.64; for the 25th, \$112.57.

Raymond & Ely.

Letter of the 24th from the Superintendent says the mills are running well, with about 1,200 tons of ore on hand. The roads are good, about 150 tons going down daily. Work in the mine is progressing well. Drift on eighth station is in 70 feet, west drift, 7th level, is in 73 feet, east drift 110 feet, no special change in either. In 6th level, west extension, there is some improvement. The stopes in the upper levels of this ground are yielding exceedingly well. Tracings about Panaca shaft are good and nearly completed.

Dispatch of the 31st says. "I shipped today, \$37,336." Previous shipments this month aggregate \$205,062—making a total for the month of March of \$243,391.

Savage.

The weekly report for the week ending on the 29th gives the following summary of operations: Ore extracted from the mine, 241 tons 1,900 pounds; ore shipped to the mills, 355 tons 1,900 pounds; on hand at the mine, 25 tons; average assay value of the ore, \$25.53. The ore came from the second station of the north mine.

Silver Peak.

Letter of the 28th says the ore breasts are still looking well—if there is any change it is for the better. Arogeting out all the ore that can be hoisted with the windlass. If the ore holds out as it is now there will be no trouble about making it pay. The Floral mill has not started up yet, but it will start soon, and we will then have the ore worked as soon as possible. A sample from the breast on the 24th gave an assay value of \$46.47. A sample taken from each tub yesterday as it was hoisted gave an assay value of \$155.73.

Union G. M. Co.

There was received on April 1st at the office in San Francisco from this mine, located in Howland Flat, 161 ounces of gold dust.

MINING SUMMARY.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned:

California.

ALPINE COUNTY.

ALPINE.—Alpine Miner, March 22: The south drift in this mine is encountering bunches of ore, and it is said to be probable that the copper vein which crossed the main tunnel back of the ledge now drifted upon is in contact with the drift, as signs of copper are seen. The main tunnel is now running in very favorable ground for progress, and feeders of white quartz are becoming more numerous, indicating the approach to a ledge. The quartz is often of the character of that found on Boulder Hill in early days, which carried gold to such an extent as to render it profitable to work in an arastra.

GLANCE.—The mine is showing nice quartz and some good pockets of ore, but the main ore vein has not been reached on its dip by the perpendicular shaft; it is slow work going down by hand, but when below 75 ft., and we are glad to learn that the Co. intend soon to commence the erection of steam hoisting works.

EL DORADO.

ST. LAWRENCE.—Placerville Republican, March 27: There has never been a mine opened in the State that has paid so well right from the start and continued without a single break to increase in richness to the depth of 40 ft. and over, as has this mine. It is certain that the St. Lawrence has rock enough that will work from \$10 to \$15 per ton to run 30 or 40 stamps for at least a year, and feeders of white quartz are becoming so numerous that it is unreasonable to believe that it will last twice that long.

PACIFIC.—This mine in this city is probably equally as good as the St. Lawrence, and it is a misfortune to the community that it is in hands that will not allow it to be worked.

POCAHONTAS.—For several months this favorite mine rather lost prestige, but we are glad to learn that it is now making a splendid showing.

SHEPARD & WITTEN.—The mine is now down 30 ft. on their ledge, and the last rock taken out looks better than any before struck.

SHEPHERD AND WHITTON LEDGE.—Placerville Democrat, March 29: A few weeks ago we made notice of some handsome gold bearing quartz taken out by Shepherd & Whitton from a shaft they had commenced sinking on the ledge of a point just behind the Empire Office. It seems that they were operating at that point by the sufferance of the Church Society and only for temporary prospecting purposes, to test that portion of the ledge. Since our notice they have sunk something like 50 ft., obtaining ore of uniform excellence all the way, and now they are negotiating for right of way, etc., to start a tunnel from a lot on Coloma Street, near Main, running under the southwest corner of our office and striking the ledge after running northeasterly about 100 ft.

HUMBOLDT COUNTY.

HUMBOLDT REGISTER. March 29: A San Francisco company have 8 men at work on a copper mine in Pueblo district, 50 miles northwest of here, and are taking out some excellent ore, which will be shipped below for reduction as soon as the roads and weather will permit.

BOLIVIA DISTRICT.—Silver State, March 29: Reports from the copper mines from this district are of the most encouraging character. The ledge in the north mine and rich ledge have been discovered in the district within the last two weeks. Kellogg & Co., the owners of the principal mines in the district, and withal men of ample means, have concluded to open a road from Oresau to the mines and thence to Austin.

STAR DISTRICT.—The Krom Combination is completed. The machinery was started yesterday. The Le Soto mine is producing fine ore. About 10 ft. of the vein is antimonial sulphurets, which assays high in silver. Chunks of this class of ore weighing from 50 to 200 pounds have been extracted during the present week.

SILVER CROWN.—This mine is located on the eastern slope of Table Mountain, 8 miles from the Bolivia copper mines. It has been prospecting by tunnel and shaft about 90 feet to the surface. The ledge is about 5 ft. wide and carries from 4 to 8 inches of ore, principally black sulphurets, with horn and native silver, and assays from \$1,000 to \$4,000 per ton. It is situated in a limestone formation, from which it is separated by a "gouge" sometimes a foot thick. The ledge has been discovered on the surface 600 ft. from the tunnel, and appears to be a fissure vein.

FLORAL MINE.—The mine is getting to be the rage here now. Miners have been prospecting Cottonwood Canon, and struck "two bits to the pan and the bedrock pitching." Some have quit \$4 a day in the silver mine and gone to Cottonwood, expecting to make better wages working gold mines on their own hook.

KERN COUNTY.

DAMASCUS PLACER DIGGINGS.—Havilah Miner, March 29: A letter from Shurtner and Voegel informs us of new placer diggings. Their original intention was to work on the old claim of John Kupp, but finding it a "petered bill" they prospected and have just found good diggings within a few miles of Buys, where plenty of water can be obtained for four months.

MINING AT LONG TOM.—We learn from a friend who has lately returned from a trip to Long Tom, that H. Burdett is taking out very rich rock. A run at the mill which was lately cleaned up, paid \$30 per ton. The gold could be seen glittering in the ore as it lay on the dump. The expense of the run for the same time in the immediate vicinity is now opened with several hundred tons of the same kind of rock in sight.

NEVADA COUNTY.

INABO.—Nevada Transcript, March 27: This mine cleaned up its amalgamators last Saturday, after a run of six days, gold to the amount of about \$19,000.

GREEN MOUNTAIN.—This mine, which has a mill of only five stamps, cleaned up after a six days' run on Saturday, the net little sum of \$2,500 in gold—not counting sulphurets.

EUKEKA.—This mine after six days' run with ten stamps, cleaned up about \$10,500 worth of gold.

STATE LEDGE.—This mine (Perrin's) in six days' run, cleaned up \$1,200.

MONTANA.—March 28: This Co., at Willow Valley, has had about 100 tons of rock crushed, which paid at the rate of \$38 per ton. They have plenty more of the same kind of rock on the dump.

The old Leocompton is being worked, and the rock looks first rate.

The Gold Tunnel Co. have struck a fine body of rich rock, and the prospects are better than ever.

The Murchison mine continues to yield handsome returns. Negotiations are going on for the sale of all the claims on Selby Hill and Flat, and it is thought the sale will be made in time to put the claims in order before next fall.

Preparations are being made to resume work on the Manhattan, at Gold Flat.

INABO.—Grass Valley Union, April 1: The mill completed a month's run on last Saturday, the month consisting of 30 days. The 35 stamps of the mill were constantly run. The yield of gold for that time is about \$115,000. The expense of the run for the same time amounts to about \$35,000. Underground and above ground everything is in the most splendid condition.

EUKEKA.—The run, 24 days, gave a return of about \$50,000 worth of gold. Only ten stamps have been running during the time and the result is good. The last letter of the Superintendent to the Trustees says: "The bottom west drift shows a little water, and the ground is a little harder. No change in the east drift. The

ledge in the 6th level rises is 3 ft. wide, and the quartz looks well. The ledge in the intermediate shaft and stopes looks well."

STATE LEDGE.—This Co. made a clean-up of \$1,100 for the last two weeks—the aggregate for this month being about \$5,000—expenses for the same period not exceeding \$2,800. The ledge in the mine is large, and the dump is full—the rock coming out faster than the mill can reduce it.

DAMSK HILL.—This young mine is giving promise of a prosperous future. It is now down 114 ft., and the week amounted to \$6,000 or \$63.63 per lot. This crushing came from the 2d level, at the depth of 225 ft. Another crushing will be made in a few days of rock from the bottom of the mine, 315 ft. deep. The mine is looking well in the drifts and stopes, and the crushings are always good.

HOWARD HILL.—The shaft is down about 385 ft. deep, and from the bottom of it drifts have been run to the east and to the west. The east drift is in 146 ft., and the west drift is in 111 ft. In the west drift the ledge is 14 inches thick, is between two good walls and is therefore well defined. In the east drift the ledge is not so wide but has been steadily in ravine since the drift was started. The shaft is now down 114 ft., and the ledge is 14 inches thick. The ledge is now much softer than it has been since commencing the shaft, and it is believed the contractors will be able to make 8 ft. in 24 hours. A number of feeders of the main ledge have been cut the last 10 ft., some of which assay high. A good ore body must be near. Developments in the old works continue satisfactory.

MANHATTAN.—The location of this company's claim is not far from the Pittsburg. It is a consolidation of the claims of the Krom and I. O. T. Co. and embraces 3,000 ft. of claim. It is a local mining company, the stock being held in Grass Valley and Nevada. The tunnel will be about 700 ft. in length, and the backs above the tunnel about 110 ft.

GRASS VALLEY NEW MINING CO.—Work has been suspended on the Imperial ledge owned by this Co. for the last month, owing to water, but the Trustees have not concluded a bargain for a complete pumping and hoisting rig, which they expect to have in full operation by the first of May. During the interim they have purchased an extension of the Kentucky Ledge, which they are at present sinking on, with very flattering results, having struck a fine ledge 20 inches thick, which promises to be a paying investment.

GRASS VALLEY.—This mine, situated on Oshoroa Hill, has been turning out during the past month as it did in times past. The mill is a five-stamp mill and in 18 days' run it cleaned up \$6,500 including \$81.40 received from sulphurets. For the past two weeks the rock has been piling at the rate of from \$50 to \$60 per ton. The mine is still looking well in both the north and south drifts.

KURTZ OF MALTA.—The shaft is down 97 ft. and a drift on the ledge for the distance of 60 ft. has been run. The ledge is well defined and is very large. The quartz is heavily charged with sulphurets.

BROWN SOUTHERN HYDRAULIC.—Situated on the head waters of Squirrel Creek, west of the town. They have done well this winter. Three men have been employed, and in the month of January and February gold to the amount of about \$2,000 was taken out. The water comes but little so that the profit is great. They have pitched up one piece of gold which was worth \$120. They frequently find these chips.

NORTH STAR.—The new shaft is down 270 ft., and is in beautiful rock showing gold through the whole depth.

KENTUCKY GOLD MINING CO.—This company is now fully prepared for work and is at present not doing for machinery capable of thoroughly prospecting this mine.

EMPIRE.—They have a great quantity of quartz broken up and awaiting crushing. The mill has been idle because the wood to make steam did not hold out. The ore is splendid.

NEVADA CRY DISTRICT.—The Providence, on Deer Creek, just below the City and the Nevada, on the same ledge, are showing splendid ore. The Nevada is taking out rock which will mill in the neighborhood of \$30 per ton, not counting sulphurets. These two mines are on the same ledge, have the same character of ore, and have drifted together under the head of Deer Creek.

The Henge, about 200 yards below the Providence and Nevada, is showing work and is at present not doing for machinery capable of thoroughly prospecting this mine. Rich specimen rock has been lately taken out of the shaft.

The North Potol, situated on Gold Flat, and not far from the once-famous, but now idle, Pittsburg, is in very fine ore, with ledge 4 ft. in thickness.

The Gold Tunnel mine is taking out good rock. **EXTERMINATE GRAVEL.**—This mine is located at Buena Vista, about 8 miles from Grass Valley. The Co. has been operating about 3 years, seeking to develop the riches of the gravel channel of the "slide." A perpendicular prospecting shaft was at first sunk, but the use of this has been dispensed with, and an incline put down 230 ft. from the bottom of which the main drift runs into the hill 1,300 ft. At various points side drifts and "rises" have been made for prospecting purposes, and recently a body of gray gravel has been opened near the end of the main drift, which is from 2 to 2½ ft. in depth, and pays from \$7 to \$8 per ton. The extent of this body of gravel is yet unknown, but the daily developments made upon it encourage the belief that it will prove extensive. The main shaft runs underneath the gravel, and to strike the deposit of "rises" are made, and the gravel sent down to the cars through chutes. The mine is strongly timbered throughout. The incline is a good piece of workmanship, having 2 tracks for cars, and a pump and gangway. An 8-inch pump is used, but the demand is light upon it, as the mine is remarkably dry. Recently the company have erected a 10-stamp mill in connection with their hoisting works. The stamps are 850 lb. weight, and are capable of reducing 60 tons in 24 hours. The mill has been in operation but a few days, and the first regular clean-up was made on Saturday last, after five days' run, the result being 84 ounces of amalgam, worth about \$700. The Co. have expended \$40,000 upon the mine and machinery, and although they have levied 19 assessments they have never sold out a delinquent.

PLACER COUNTY.

MINING ITEMS.—Placerville Herald, March 29: S. H. White and partner, the mine located near the Wells mine. They have a shaft down 20 ft., and at this point found 4 or 5 pieces of ore this week, all showing free gold and an abundance of good sulphurets. There is a system of veins in the bottom of the shaft, all close together, and it is believed that at a further depth of 30 ft. they will all center in a heavy, rich ledge.

S. H. WHITE.—We have seen some fine specimens from this mine, in the edge of town, bearing free gold, and the character of the rock and sulphurets are such as is only found in paying mines. The shaft is down near 180 ft., and on a good, well defined ledge.

YOLO MINE.—This is a rich strike, made a short time ago, near Temperance Flat, 3 miles northwest of here, from the surface, and was then sold. The new owners are pushing a shaft down with commendable energy. They have a large, well-defined ledge, rich in sulphurets, carrying free gold, that prospects well.

ABURN.—This mine, alias Calif-pasture, alias Dillon, is being prepared for a good summer's work. They are nearly 200 ft. below the surface, and have cut very rich ore in various drifts.

WEEK.—This mine, above Michigan Bluff, has opened on a richer strata of gravel than ever—that hardly seems possible, unless it is all gold.

SISKIYOU COUNTY.

DISCOVERY OF QUARTZ LEDGE.—Yreka Union, March 29: We understand a new quartz ledge has been discovered recently on Eddy Gulch some 3 miles from Sawyer's Bar. The ledge, it is reported, is 3½ ft. thick, has been traced for some distance on the surface by the cropping, and is marvelously rich.

TUOLUMNE COUNTY.

OLD TUOLUMNE CLAIM.—Sonoma Independent, March 29: This Quartz Co., three miles north of Columbia,

above Summit Pass, have struck richer rock than ever. They have been running a tunnel to tap and drain the mine at a depth of 60 ft., and the prospect is that they will be liberally rewarded for their enterprise, by developing one of the best quartz veins in the county.

OLD CAMPBELL LODE.—This lode is situated on the American Camp road, below Morgan's mill, about 3 miles above Columbia. On Saturday we saw a prospect of \$1.50 from 3 pans of the casing. The vein is a good one, as is proved by rock that has been tested at a distant mill, and found to net from \$15 to \$20 per ton. Rock is easy to get out, and the prospect is that they will work six years ago, and over \$7,000 taken out, but being unable to procure the necessary machinery to work to advantage, like many miners in similar circumstances, they gave up a good mine and scattered.

Nevada.

ELY DISTRICT.

SILVER PEAK.—Pioche Record, March 23: Considerable ore, considering the means of hoisting, has come up during the week through the main shaft. Ore bodies are being exposed. The following are the results of assays made since our last: Mine sample, \$33.60, on the 19th; do, \$175.20, on the 20; do, \$55.50 and \$50.20 on the 21st and \$45.04 yes erday. The width of the ore vein is now about 12 inches.

PIOCHE-PROXIMA.—Some little embarrassment has been encountered from the scarcity of timber for the main shaft. The rock is now much softer than it has been since commencing the shaft, and it is believed the contractors will be able to make 8 ft. in 24 hours. A number of feeders of the main ledge have been cut the last 10 ft., some of which assay high. A good ore body must be near. Developments in the old works continue satisfactory.

WYANDOTT & CHASE.—About two tons of ore a day being hoisted, and about 175 tons on the dump. The assays vary, but there is no doubt that the mill yield will not fall short of \$100 to the ton. The rock has become softer, and much better progress than usual is being made in the shaft and drifts.

MEADOW VALLEY.—We know but little about this mine, save from hearsay, but "common report" among local miners says it is to be the "biggest" this year in the State—or rather, that millions are "in sight," which will be hoisted some time this summer.

RAYMOND & ELY.—Not less than 900 tons of ore have been delivered at the mills during the week, two-thirds of which is first-class. From 115 to 120 tons a day are being hoisted. The ore breasts never looked so good in all the history of the mine. The slopes are all being worked to the fullest extent.

PROCTOR.—Ore has been reduced at the Magnet mill during the week, but the returns have not been all received. There are still 150 tons of good ore on the dump, which, judging from the yield so far, ought to pulp over \$150 to the ton. Unaltered quantities continue to be hoisted, and the mine continues unchanged. Full force engaged.

EXTERMINATE.—From 10 to 15 tons of high grade ore are being shipped daily to the Magnet mills. Large quantities of ore continue to be brought to the surface. The main shaft is down 280 ft. Ore bodies large.

ALPS.—The drift from the 160-ft. level has cut a 4-ft. vein of very rich ore, some of the assays running up to \$200 to the ton. The ledge dips to the south. The ore breasts in all parts of the mine are looking well. The drift at the 300-ft. level is in 34 ft.

MONTANA.—This mine is looking better now than ever before. Few mines in the district expose a better defined or larger vein.

PEAVINE.—The ledge is widening out at two points, the ore containing its average richness. Still drifting on the ledge, the vein continues to yield high-grade ore throughout an extent of 150 ft. There are large bodies exposed.

STAR OF THE UNION.—The vein under which the incline runs was tapped 210 ft. from the surface, and a quantity of the ore was extracted for testing. It looks very rich.

EUKEKA.—First-class ore was worked at the Magnet mills during the week, the pulp assay averaging \$224.60; second-class rock, \$125.40.

LOUISIE.—Work is now confined to the 200-ft. level. Two fine seams of ore have been cut during the week. The drift for the last 15 feet has been through mineral-stained ledge matter.

EUKEKA.—The shipments for the week have been immense, notwithstanding only \$50,525, have been returned from the express office. We are well assured much more has been carried out by other means.

STAR DISTRICT.—The reports from Star District, 90 miles northeast of here, in Beaver County, Utah, continue very encouraging. The principal developments are on the Hickory ledge, sold a short time ago to the Star Co. An incline has been sunk on the ledge 130 ft. and it is claimed 600 tons of ore have been extracted in sinking the incline that distance. It is free milling ore, and is said to average \$250 to the ton. Machinery is now on the road from Salt Lake for hoisting works and a 20-stamp mill. Other rich ledges are also being developed.

EUKEKA DISTRICT.—This is 6 miles from the Meadow Valley, and about 30 miles south of Bullionville. The Clingmuth ledge is leading in development. The shaft on it is now down 114 ft., and 2 ft. of good ore is exposed at the bottom. It is of the free milling class, and assays from \$30 to \$300 to the ton.

EUKEKA.

PAUL JONES.—Eureka Sentinel, March 25: We made an error in the figures of the assayer's return upon one of our mine, in our local item of Saturday. The highest assay given should have been \$2,800, instead of \$2,400 per ton. Several assays resulted in a return of \$2,300, \$2,400 and \$2,700 to the ton. There are upwards of 30 tons on the dumps, beside a large quantity sacked up for shipment.

CHAMPION DIAMOND DISTRICT.—We saw some fine ore from the Champion last evening, assays from which gave a result of \$312 per ton in silver. There are several mines in the vicinity of equally good quality in ore. These are, Champion South Extension, Bamboo, and Graet.

AN IMMENSE MINE.—Eureka Sentinel, March 26: We learn that the body of ore recently struck in the old Richmond works is, day after day, as explorations are extended, assuming larger proportions. It is some distance up the hill from, and south of the Tip Top incline, though not within the limits of the territory now in dispute between the Richmond and Eureka Consolidated. It has been said that in the event of the Richmond company losing the pending suit, the London Directors would probably decide on abandoning this district, but as it now appears there is an abundance of good ore in the mine, free of all dispute, the idea, if ever seriously entertained, will likely be discarded. The company deserves to be protected in its investment, but we submit that much trouble might have been averted had a careful, practical management, been the order of things. The amount of high grade ore in the Canon, and in that part of the mine under dispute is said to be perfectly astonishing—one surveyor putting it at a million of tons, and other good judges at even higher figures.

THE KENTUCKY MINE.—Eureka Sentinel, March 30: The Eureka Mining Co. has two shifts at work on the tunnel which is being run to strike the ledge. The intention is to carry the tunnel 450 ft. in the hill, at which point it ought to cut the lode at a depth of 240 ft. Large quantities of high grade melting ore were taken from this mine two years ago and there is good reason to believe that ere long it will be more productive than ever.

RICH ORE.—J. B. Osborne returned yesterday from an inspection of the Golden & Bender mine in Sevier Canon, and brought a very fine piece of horn silver ore with him. It appears that the main shaft is down 140 ft. and drifts are being extended from the bottom of it.

(Continued on Page 220.)

The Mendha Company's Mines.

The Mendha Mining Company, at Higbland, own two ledges, which they are energetically developing, and from which they have taken out, ready for crushing, from 1,000 to 1,200 tons of ore. Their fine new mill will be in operation before long, when reduction will begin and continue night and day. If expectations are realized, Higbland will develop into one of the richest silver-producing districts in the State, and we have confidence in the success of the Mendha Company's enterprise. The first ledge in order of consideration is

The Mendha Mine.

It is about a mile and three-quarters west of the Mendha mill, the principal developments being in and on the east rim of a well-wooded cañon, which the ledge crosses from east to west. The mine is 7,600 feet above the sea level, and 200 above the mill-site. Just below the development the cañon opens out into a beautiful grassy glen, with overhanging cliffs, covered with cedar and dwarf pine. The country rock, through which the ledge trends as far as opened, is a close-grained gray limestone. The ledge runs almost directly east and west, and can be traced by the croppings for hundreds of feet. A tunnel has been started on the west side and at the bottom of the cañon, and follows the ledge in to the westward a distance of three hundred feet. It is four and a half feet wide and six high. Work continues in it, and it will be driven in four hundred feet further, at least, before suspending operations. The dip of the vein is from the south to the north, the incline being about seventy-eight degrees. The vein varies in width from the mouth of the tunnel to the face, from six inches to five feet, but its average extent may safely be set down at two feet, as it is strong and well defined the greater distance. At a point 200 feet from the mouth of the tunnel it widens out to six feet, the ore being very rich, assays running from \$80 to \$400 to the ton. This, too, is about the range of cropping assays, the ledge being as well defined for 700 feet on the surface as in the tunnel. The tunnel at its face is 170 feet below the surface, but the ledge crops out on the surface 700 feet west of that point. The ore is of the sulphuret class, carrying large percentages of lead and iron. Professor Mathey feels great confidence in his ability to reduce them and save all the silver, says he has had considerable experience in the reduction of similar ores. The vein walls are of the same general formation as that entire district—close-grained grey limestone. Between the vein matter and walls there is a thin layer of pure white lime, which leaves its mark on what it touches, like chalk.

The main shaft of the Mendha mine is 306 feet east of the tunnel. It is now down 210 feet. The ledge at that point goes down straight a great distance, the shaft following it the first 100 feet. It then dips to the north. Where the shaft leaves the vein, 100 feet down, the mineral body is 13 feet wide, but the ore is low grade, the average assay being \$73. The average width of the vein to the first level is set down at three feet, much of the ore being high grade, assays running as high as \$400 to the ton.

At least 600 tons of ore have been taken out of the tunnel and main shaft of the Mendha mine, and only "dead" work, so far has been done.

Excellent steam-hoisting works are in operation, with blacksmith shop connected. Attached to the engine is a first-class condenser, and the mine is aired by the patent, noiseless fan-wheeled ventilator.

The contiguous hills are covered with growing timber, admirably adapted to all mining purposes.

The Mendha mine was discovered by a party of prospectors in the fall of 1869. They got the name from the Indian heroine of one of Ned Buntline's famous border fictions.

The Arizona Mine

Is also owned by the Mendha company. It is reached by ascending the mountain to the east of the Mendha mine to its summit. At the discovery shaft it is 8,400 feet above the sea level. The formation it is in is the same as that of the Mendha, and the ore looks as much like the Mendha ore as one pea like another; but, strange as it may seem, the vein, at discovery, is as flat as a floor, and trends north and south, while the Mendha's trend is east and west. The vein, in some places, is 18 feet wide, and in no place developed has it fallen below 3 feet. Six hundred tons of the ore are out, and 6,000 at least, are in sight. Some of it assays as high as \$450 to the ton, and it has never fallen below \$70. Of course this cannot be a regular vein; but about 100 yards below this immense mass of ore the regular ledge was discovered, running in the same direction, with about the same dip, and between exactly the same walls, as the Mendha, a mile to the west. No doubt they are one and the same ledge. Professor Mathey himself discovered the regular vein of the Arizona. The vast flat deposits of ore above—the origin of which we cannot and will not attempt to account for—were discovered by some prospectors from Arizona in the fall of 1869.

A 1000-foot tramway is being constructed from the Arizona mine toward the main road to the mill, by means of which the ore can be delivered for reduction very cheaply.

The Arizona, like the Mendha, is surrounded by an abundance of fine growing timber, adapted to every use in the mine's development. But there is no natural water supply at either

mine. This, however, will be no drawback, as the returning ore vehicles can furnish an abundance of water.

The developments of the mines of the Mendha Company is under the immediate supervision of Mr. Hugh Mullen, a practical miner of great experience.

We believe Professor Mathey will soon demonstrate that Higbland is one of the best silver camps of the State. The mines are among the most promising we ever visited.—*Pioche Record*.

Montana Ore Shipments.

From what we learn from the mining districts there will be a large amount of ores shipped to foreign points this season for reduction. The transportation has been all or nearly to Montana and none or nearly from Montana, notwithstanding there are thousands of tons of high-grade ores on the dumps, and the owners have held them as dead property and paid more interest on money to develop their mines than the transportation of their ores to foreign reduction works would cost. Freighters can take back half-loads to the river and railroads, at about the same cost as they can go empty, and will make freights reasonable to acquire the freight. From Bannack we learn rates can be readily secured to Corinne at \$20 to \$25 per ton; from Butte, Vipond, and that vicinity, \$30; from Philipsburg, probably \$35 to \$40. These figures will cover the freight from any quartz camp in Montana to Corinne. Central Pacific rates from Corinne to San Francisco do not exceed \$20 per ton. There they can be sold at fire assay values, or reduced at reasonable terms. With the immensity of high-grade ores out that will pay a large return over these costs of transportation and reduction, there is no good cause why the owners should not select and ship at least such quantities as will enable them to prosecute the development of their leads without "soaking" their mine for the "where-withal" to do it. It may be a long time before reduction can be so perfected here that the results will be as satisfactory as those obtained abroad, and even were railroads built the net cost of laying ores down in San Francisco would not be materially lessened from many of the camps. There should not a wagon go empty to Corinne this year. There are thousands of dollars lying at the mouths of the shafts and tunnels of Montana quartz lodes in ores that will pay good margin on shipment—better, perhaps, than you will get out of them for years here. Combine together if not able to act individually, make arrangements with freight agents and responsible parties in San Francisco, or wherever you ship to select and pack your ores and start them the first opportunity, and if your ores have value you will get such returns that you will not need to "see your Uncle," but will have money to develop your leads.—*New Northwest*.

Pacific Coast Appropriations by Congress.

The following is a summary of special items for California, contained in the various general appropriation bills passed by the last Congress: Indian bill, \$940,900; for legislative purposes, etc., \$338,705; for fortifications, \$240,000; for Post Offices, \$950,000; for river and harbor improvements, \$100,000; naval purposes, \$98,809.75; Sundry civil appropriations, \$1,839,549.80; deficiency, \$218,287. Total for California, \$3,724,147.42. This sum is equal to more than four times the aggregate for all the remaining Pacific Coast States and Territories.

The aggregated items of Nevada are as follows: Indian Bills, \$27,500; Legislative purposes, \$144,400; Sundry Civil purposes, \$53,700; Deficiency, \$52,975.53. Total for Nevada, \$293,573.88.

The aggregated items for Oregon are as follows: Indian Bill, \$153,850; Legislative purposes, \$795; River and Harbor Improvements, \$23,000; Sundry Civil appropriations, \$178,500; Deficiency, \$960.58. Total for Oregon, \$363,310.58.

The aggregate items for Arizona are as follows: Indian Bill, \$341,000; Legislative purposes, \$26,500; Sundry Civil Appropriations, \$72,811.80; Deficiency, \$152,523.77. Total for Arizona, \$593,835.58.

Aggregate items for Washington Territory are as follows: Indian Bills, \$11,185; Legislative purposes, \$44,509; Sundry Civil Appropriations, \$11,585; Deficiency, \$1,783.22. Total for Washington Territory, \$73,983.22.

It is possible that some of these items, especially those pertaining to surveys of the Pacific Coast, and collection of mining statistics, etc., contained in the aggregate amounts for California, may be partly used for Nevada, Oregon and Washington Territory.

COAL IN INDIA.—A small quantity of coal obtained from the pits recently sunk at Sasti, near Chandah, in his Highness the Nizam's Territory, has been experimented upon by the Peninsular and Oriental Company's agent at Bombay with a result that has far exceeded the most sanguine expectations. The agent, we believe, has reported that on comparing the Sasti with Newcastle coal, the consumption of the former for a given period only exceeds that of the latter by 22 per cent. in quantity; and when it is considered that the specimen experimented upon was by no means the best obtainable from the Sasti pits, and that it had for some months previous been exposed to wind and weather without any protection, the result is a highly satisfactory one. The exploring party at Warungal have come upon an excellent seam of coal at a place called Singareddy.

Cherry Culture.

Among the early fruits of the season none are more acceptable than the cherry. As with strawberries, so with good ripe cherries, almost everybody likes them; but to grow them everywhere successfully in California is a very difficult matter. We are going to show, however, that very much depends upon skill or mode of culture. Where we find a man who has made the culture of any variety of fruit a specialty, giving his chief attention to a particular kind of fruit, experimenting for years, in a climate like ours, we are prone to believe he has learned something that everyone don't know.

With this view of the subject, we introduce to our readers the practice of Mr. Wm. C. Geiger, at his place, two and a half miles west of San José. This gentleman has made the growing of fine cherries a specialty, and has been eminently successful, and yet, the first question a person would be likely to ask on seeing his cherry trees, would be—Why don't he trim up

Fig 1.

Fig. 2.



TRAINING THE CHERRY TREE.

his trees, and make them look like something?

All who have attempted to grow cherries in California, know how prone the trees are to make an enormous upright growth, almost destitute of side limbs, and generally producing a tree of which Fig. 1 is a type. It is common to give to cherry trees in this climate a low trunk, better to shade it from the effect of the sun's heat, but still it is common to trim to a smooth trunk from two to four feet from the ground.

The method so successfully pursued by Mr. G. is quite the reverse of this, as indicated in Fig. 2. To commence with his mode of culture, we begin with his seedling trees which he procures at one year old from Eastern nurseries, from six to eight inches in height. These are set out, headed back and make a growth sufficient for hudding in July or August a few inches from the ground. These trees at one year old from the bud, and two from the seed, are then set out where they are to stand, and now comes in the first of the peculiar treatment they are to receive.

Every bud upon the entire length of the body is allowed to grow and produce a shoot, and when these shoots or limbs—all but the upper terminal one—have attained a length of six or eight inches, they are checked by pinching out the terminal bud; the effect is to convert them into fruit spurs. This practice is continued up to the point where it is desired to have the tree form its top; which in Mr. G.'s practice has been from 2½ to 3 feet from the ground, though in future he will adopt 2 feet as the rule.

At this height the side shoots may be even a foot in length, but by being frequently pinched in, are almost entirely fruit-bearing spurs. In forming the head of the tree, a similar practice is adopted, except that now as in Fig. 2. the side shoots are allowed their full length, but the one central shoot which should always be maintained in cherry trees, is checked in its upright growth when 18 inches long, by pinching the terminal bud. This has a tendency not only to cause a spreading habit in the tree, but

it also causes a thorough ripening and full maturity of the wood.

The next year and the next, the same course is pursued, at any and all times pinching in the terminal buds when they have reached a length necessary for the perfect symmetry of the tree, as in Fig. 2. The rationale of this method is this, the side shoots along the trunk of the tree to its first regular limbs, serve to shade the bark from the intense heat of the sun, so that there is never a "sunn scald" of the bark so injurious to all trees, both from direct cause and from the borer which always attacks the tree if at all, in these dried sun scalds.

Another excellent effect produced by the growth of these side limbs, is the strengthening of the trunk of the tree, giving it enlarged size and vigor, every leaf adding its quota to the direct growth of wood. As an offset to what may, by some be deemed an unsightly object because of the growth of these trunk limbs, we offer this, that as many as three pounds of asplendid cherries as the tree can grow, are produced upon these fruit spurs below the regular limbs or branches forming the head of the tree.

As regards the simple matter of form, we cannot even see that Fig. 1 with its smooth-trimmed, naked trunk, has a particle more of beauty about it than Fig. 2, although it has always been the fashionable cut and trim for orchard trees. When the top of the tree becomes large, these side shoots from being much shaded, naturally drop off, but leaving no large scars or wounds as where the knife is injudiciously used. Mr. G. never uses the knife in giving form to his young trees, but relies entirely upon his fingers and the pinching-in process.

We had intended to speak further of Mr. G.'s success in cherry culture, number of trees, best variety for general culture, home market and shipment; mode of culture pertaining to the soil, etc., but which, owing to the length of our article already, we must defer.

A Wonderful Well at Pioche.

For eleven months, says the *Pioche Record*, Mr. Frank Takats and Charles Netzel have been engaged sinking a well on the flat north of the city. They are now down 322 feet. For 300 feet the shaft went through a compact cement or conglomerate rock formed of limestone and quartzite; at that depth a stratum of wet varicolored clay was encountered, soft and pliable enough to be rolled into marbles in the palm of one's hand; this clay streak, or layer, was passed by sinking two and a half feet further, when a sand concrete was encountered, very solid and compact; and the shaft continued to be sunk through this formation a foot or two, when the workmen were surprised to hear strange gurgling noises from below, as of splashing water, accompanied by occasional rumbling sounds, such as is made by rocks colliding with each other in a turbulent, rapidly flowing torrent. Finally, a little fissure, or crack, about half an inch in width, was discovered running across the bottom of the shaft, which was characterized by an air draft of great force, all the small fragments falling near it being sucked in. From this crevice in the close sandstone formation issued the strange sounds. A lighted candle held close to it was instantaneously extinguished by the draught. The workmen continued sinking a few feet further, when the evidences were too strong of a vast chamber below coursing through by a subterranean current of great body, to be longer doubted, and work was temporarily suspended. In the meantime, the hoisting of gravel, with the means at hand, had become too slow and laborious for much progress to be made.

Messrs. Takats & Netzel, now that they have sufficiently demonstrated that an abundance of water is obtainable by sinking, solicit assistance from citizens in erecting a whim, and continue their developments until water is reached and the necessary machinery put in place to bring it to the surface in inexhaustible quantities. They will certainly receive all the assistance they need, for where water sells at from three to four cents a gallon, as it does in Pioche, an unfailing well must be considered the best of property. As the air from the draught of the fissure is fresh and pure, it is almost certain that the water below is likewise fresh and pure. Now, why should we not expect to find a subterranean river in this locality? No running streams exist within miles, and no springs, to speak of. Our water is furnished from a few fountains several hundred feet above the city level, and surrounding us are high mountains, on some of the summits of which snow lies the greater part of the year. If the hope should be realized, it is very probable that the desert to the north of us will soon be transformed into fields of fertility, for the soil is naturally rich, and water is only necessary to make it highly productive.

Useful Information.

Spoiling Mirrors.

It is a fact worth knowing, but which does not seem generally understood, that the amalgam of tin foil with mercury which is spread on glass plates to make looking-glasses, is very readily crystallized by actinic solar rays. A mirror hung where the sun can shine on it is usually spoiled; it takes a granulated appearance familiar to housekeepers, though they may not be acquainted with its cause. In such a state the article is nearly worthless; the continuity of its surface is destroyed, and it will not reflect outlines with any approach to precision. Care should therefore be exercised in hanging. If any of our readers have mirrors which appear to be spoiling, it would be well to ascertain whether the direct sunlight strikes them. If thus exposed, they can probably be saved from further injury by simply changing their position. The back as well as the front must be protected. A small glass hung in a window, where the rays strike it behind, is peculiarly exposed. The back should always be covered where the beams are likely to touch it.

The greatest danger to looking-glasses, however, is in transporting them. Very expensive ones have been seriously injured by careless handling when merely carried across a street. The men who move furniture are seldom fully aware of these possibilities, and need to be cautioned and watched. Frequently a man or boy may be seen in the street carrying a mirror in such a way that the full glare of a noon-day strikes and injures it. Owners of such articles would, as a rule, be able to keep and use them much longer if they would exercise much caution in this regard. To re-silver a pier-glass often costs as much as one-fifth of the original price of the article; while the common glass is seldom worth re-silvering.

It is also well to avoid hanging a mirror near a stove or fire-place, where the heat radiated can reach it. If this precaution is neglected, granulation is likely to occur, even in a comparatively dark room, by the influence of warmth instead of light. A lamp or gas jet, if placed too close while burning, though it may not crack the glass, will also often bring about the same injurious crystallization, and will even sometimes cause the amalgam to melt and run off.—*N. Y. Mercantile Journal.*

Pewter.

The principal constituents of pewter are lead and tin; the proportions of the two metals depending somewhat on the use to which the alloy is put. The best contains but sixteen to twenty per cent. of lead. Of this plates and dishes are made, which look like block tin, and can be brightly polished by rubbing. The addition of more lead cheapens the commodity, and gives it a dull bluish appearance. In France pewter vessels for wine and vinegar contain eighteen per cent. of lead. It has been found that a large portion of that metal in utensils for this purpose is liable to result in the formation, in the liquid, of the poisonous acetate or angar of lead.

A little copper added in making pewter hardens the compound and renders it sonorous, so that toy trumpets and other rude musical instruments can be made of it. If the copper is replaced by antimony, hardness and a silvery luster are the result. If the contents of the melting pot are stirred with a strip half of zinc and half of tin, or if a lump of zinc is allowed to float on the melted metal during the casting, the vaporized spelter seems to protect the fluid mass from oxidation, and prevents the formation of dross. Hence it is said to "cleanse" the mass.

Jewelers use polish and laps of pewter, and sheets of the article are to some extent used for cheap engraving, music notes, or other figures being stamped on it instead of being cut with a burin or graver. The ease with which it melts enables it to be employed by tinsmiths and tinkers for solder. Care must be taken not to set pewter dishes, mugs, spoons, lamps, etc., on stoves or other hot bodies, as, if left for any time, they are liable to settle into shapeless lumps.

IMITATION OF MARBLE.—Imitations of marble are in great demand for ornamentation, and many different compounds are used for the purpose. Mr. Pichler, a glider in Vienna, from his own experience, recommends the following composition as being simple and satisfactory: Into one pound of best joiners' glue, boiled rather thick, half a pound of rosin (colophonium) is to be slowly stirred. (Instead of the rosin the same quantity of Venetian turpentine may be used.) Into this plastic mass is worked a mixture of powdered chalk and of any mineral color of the desired shade, and after the addition of a little olive oil it is ready for moulding. It is sometimes convenient to have the material in the shape of thin sheets to be cut as required; and in this case the mass is rolled out upon a slightly heated plate. Mr. Pichler asserts that this composition hardens rapidly, and can be easily polished. When kept for a length of time it should be wrapped in a moist sheet, and exposed to gentle heat before using. The variegated marble-like veins can also be produced by kneading together differently colored portions of this mass.

ALCOHOL IN FOOD.—The alcohol is not destroyed, but evaporated by the heat of cooking the food. In the preparation of extracts, the heat is intentionally not raised high enough to drive all the alcohol out by evaporation, as some alcohol must be retained, in order to prevent the extract spoiling. So the alcohol in wines serves two purposes, firstly, to prevent this spoiling (wines deficient in alcohol do not keep); and secondly, as a solvent for the ethers peculiar to the different wines. The alcohol is present in pure wines in so small quantity that no moderate use at table can intoxicate.

GOOD HEALTH.

[From our New York Correspondent.]

The Fallibility of Medico-Legal Jurisprudence.

One's confidence in the testimony of "experts" is apt to be a little shaken by such absurd and contradictory evidence as we have been favored with in the Schœppe and Wharton trials. If these were exceptional cases, we could put them aside and soon recover our faith. But they are only instances of what is happening every day. Acknowledged scientific men, with remarkable uniformity, flatly deny each other's assertions from the witness-stand. "The learned gentlemen's solutions were imperfect, his filtrates impure, his precipitates ambiguous. Just listen to me for a moment and I will convince you of the dazzling whiteness of black." This sort of thing is entirely too common. With all respect to the profession, why is it, we ask, that you fail to distinguish between human and other blood corpuscles (as in the late Boston trial); or between the orange sulphide of antimony and the innocuous canned tomato? Even in so simple a matter as the detection of arsenic, errors are frequent.

A family in the vicinity of New York were all taken sick at once and manifested symptoms of arsenical poisoning, the doctors said. It was the brilliant new carpet that did it, of course. So an expert was called upon to examine the accused carpet for arsenical dyes. Needless to say, he found an amount proportionate to his fee. So a suit was brought against the seller of the carpet for damages, he, to cover himself, began another action against the wholesale dealer who sold it to him; the wholesale man passed it back upon the manufacturer; and the manufacturer upon the party who sold him the dye-stuff. There was no end of chemical evidence. Experts were more numerous than the trials. Finally it occurred to the dyer, who was in a bad way, having no one back of him to prosecute, to have a fresh analysis made of this much abused carpet by Dr. Chandler who pricked the legal bubbles by satisfactorily proving that there was not a trace of arsenic present!

It is easy enough to criticize. But how, or where, or when, can we look for a remedy? Charlatans are in the "expert" line, as well as every other. Who is to decide as to the capability of an analyst? A scientific school diploma doesn't seem to be as reliable an endorsement as that most respectable document is usually considered. Nor does previous success always guarantee future precision, as we find to our cost.

The truth is that the whole question of chemical analysis in the matter of poisons is not at all on a par with the rigidly accurate results of the bullion assay, for instance. Intelligent juries are rather slower in convicting on such testimony than of old. And the more thoroughly scientific a chemist is, the more readily will he acknowledge his weakness. It is only the quacks who will swear positively to their tests in doubtful cases. Most of our best American chemists refuse to touch the poison business. There are exceptions—as Dr. Chandler and Dr. Doremus, who are undoubtedly at the head of the profession. Such men can not suffer from contact with the ordinary run of "experts," and may venture where the average chemist would be contaminated.

A. W., JR.

THE EFFECT OF DIFFERENT COLORED LIGHT UPON RESPIRATION.—The animal to be experimented upon was placed in an airtight box into which no light could penetrate except such as passed through glass of a given color. Air freed of carbonic acid was constantly admitted into the box, and escaped by a second opening, where it was passed through a vessel which contained some absorbent of carbonic acid, so that its amount could be accurately determined. Representing the quantity of carbonic acid respired by a dog in a given time, under white glass, by 100, the amount given off under black glass was 82.7; under violet, 87.78; under red, 92; under blue, 103.77; under green, 106.03; and under yellow, 126.83. The difference was still greater when the experiment was tried on a pigeon and on a hen. The authors came to the conclusion that green and yellow rays, which are the most important to the vegetable kingdom in taking up carbonic acid, are also most favorable to the respiration of animals—that is, enable them to give off the most carbonic acid.

EATING LATE.—It is very injurious to eat just before retiring. The desire for it is simply the result of habit or of a morbid craving—and should be at once overcome.

MISCELLANEOUS.

How to Dish up Oatmeal.

OATMEAL PORRIDGE.—Take six table spoonfuls of meal and soak it over night in a pint and a half of water; in the morning stir it up well, and place the pail into a kettle of boiling water; let it boil for half an hour, as hard as possible; then stir in a cup full of milk and let it boil fifteen minutes. Season with salt, and eat with cream and sugar. Soaked over night, it requires much less cooking. A large supply can be made in cold weather, for it warms over as good as when fresh. It can also be made without the addition of milk.

UNFERMENTED OAT CAKE.—Soak one pint of meal in one pint of buttermilk, over night; next morning add one small tea-spoonful of saleratus, dissolved in water, and wheat flour enough to roll out into thin cakes; bake on flat tins in a hot oven.

OATMEAL AND COCONUT CRACKNELS.—Oatmeal mixed with grated cocoanut produces a very attractive cake to both old and young. Take three heaping table-spoonfuls of grated cocoanut, or two of this prepared "dessicated" cocoanut; add to it half a pint of the finest oatmeal, and two heaping table-spoonfuls of sugar; stir it into one gill of boiling water, and mix it thoroughly together; turn out on the rolling board, well-floured, and roll it as thin and cut out as for common cracknels put a bit of citron and half a dozen currants into each cake, sticking them into the dough. Bake in a slow oven, and watch carefully, lest they brown a shade too deep. To make them crispy let them stand a day in an uncovered dish. A very palatable pie crust can be made from the dough of oatmeal cracknels by wetting it a little thinner; or in preparing it, add just half the measure of meal in hot water. Add no butter or lard, simply a little salt; roll out thin, and make the pie of cooked fruits, as this kind of paste bakes very quickly, and if the fruit requires cooking, it would become too hard and brown. Most persons who eschew all kinds of pies can eat those made of oatmeal without fear or trembling, and they will soon learn to consider oat meal an invaluable addition to their tables.

OATMEAL BREAKFAST CAKE.—Take one pint of oatmeal, a pinch of salt, and just warm water enough to stir it up into a batter, like griddle cakes. Pour it into a shallow baking pan, and bake it for twenty minutes in a hot oven. But if on a cold morning your oven refuses to heat, turn your batter into a greased "spider," or frying pan; set it on the top of the stove and cover it closely; bake it fifteen minutes. Break open the cakespread with butter, you will find it quite toothsome. Or, if you prefer, bake it in small cakes on the griddle iron, first putting in a handful of wheat flour and a little more water. The cold porridge will also make delicious griddle cakes.

OATMEAL CRACKNELS, OR SCOTCH BANNOKS.—Take the finest quality of oatmeal stir in barley and enough water to wet it through, add a pinch of salt; let it stand ten minutes to swell; then roll it out a quarter of an inch in thickness, first flouring the board and rolling-pin with flour, cut it with a biscuit cutter, and bake in a moderate oven, as these cakes will burn quickly, and only require to be of the lightest brown. They will snap easily between the fingers, and are delicious for lunch and when prepared and baked just right, they have a pleasant nutty flavor that is very agreeable, and requires no butter to make them palatable. Put into a close jar, they will keep several months. In the Highlands they preserve their bannocks in the barrels of oatmeal, and keep them a year or so.

A COMMON ILLUSION.—There are few greater illusions, than that which attributes the results of too much eating and drinking to excessive mental labor; and it is one of those fictions the author of which invariably comes to believe himself. We have among us hosts of hypochondriacs who are always calculating the effect of work on their system, and who base their calculations on headaches, and fits of nervous prostration, and symptoms of lassitude that have no more to do with intellectual exertion than they have to do with the Gulf Stream. They are, for the most part, the natural result of too many invitations to dinner, of incautious and intemperate consumption of food and drink at unseasonable hours, and of a curtailment of sleep occasioned by getting home early in the morning.

Sewing Machines.

Few, we think, are aware of the immense number of sewing machines which is required to meet the annual demand for this now indispensable adjunct of the household. The *Hartford Times* has given the actual returns of the State of the different manufacturing companies for a single year—1872, and doubtless the number is but very little in excess of any previous year during the last decade.—We copy as follows:

	Machines
The Singer Manufacturing Co.....	312,758
Wheeler & Wilson Manufacturing Co.....	174,083
Howe Machine Co. (estimated).....	154,000
Grover & Baker Machine Co.....	52,010
Domestic Sewing Machine Co.....	49,554
Weed Sewing Machine Co.....	42,444
Wilcox & Gibbs Sewing Machine Co.....	33,639
Wilson Sewing Machine Co.....	22,663
American B. H. O. Company.....	18,930
Gold Medal Sewing Machine Co.....	18,897
Florence Sewing Machine Co.....	15,797
B. P. Howe Sewing Machine Co.....	14,907
Victor Sewing Machine Co.....	11,901
Davis Sewing Machine Co.....	11,376
Bless Sewing Machine Co.....	6,663
Remington Empire Sewing Machine Co.....	4,983
J. E. Breunsdorff & Co.....	4,262
Keystone Sewing Machine Co.....	2,665
Bartlett Reversible Sewing Machine Co.....	1,000
Bartram & Fenton Manufacturing Co.....	1,000
Secor Sewing Machine Co.....	811

Total for 1872.....851,736

These remarkable facts show how literally, how generally, the new sewing machine has become a household necessity. By far the greater number of these machines were sold at enormous profit. Owing to a combination on the part of a few leading machines, all the latter inventions have been obliged to agree to sell at the rate not less than \$60; otherwise not even the payment of the royalty demanded in every such case could avail to give them the right to use the peculiar patented "feed" movement on which the success of every sewing machine is supposed to depend, and of which three or four have a monopoly. Thus a machine of which the total cost, for making, is not more than \$15 or \$18, sells for \$50, \$70, or \$80, according to the style and finish. The larger part of these sales are to sewing women who have to work for a living, and to families of moderate means. There should be no good reason why machines as good as Singer's or Wheeler & Wilson's could not be sold for \$30 apiece.

CHAPPED HANDS.—In a healthy condition the skin is kept supple by an oily secretion, which answers the same purpose as oiling leather. During warm weather this secretion, in common with all the other secretions of the skin, is more abundant than in cold. When it is insufficient the skin becomes dry and harsh; and in those parts of the body where the skin is thick and subject to much motion, as on the hands, it readily cracks or fissures. The amount of this secretion is so much reduced in cold weather that the frequent washing of the hands with soap causes them to chap readily, and this the more certainly if the soap is not thoroughly washed off. The alkali in soap is usually in excess, and this combines with the oily secretion, and so deprives the skin of its natural lubricator. To prevent the hands from chapping, then, be careful to wash all soap from them thoroughly in clean water. This will ordinarily suffice; but if not, it will be necessary to make good the removed oil by the use of glycerine, honey, mutton tallow, etc.

BETTER THAN GOLD.—We often hear little boys telling of the wonders they will do when they grow to be men. They are looking and longing for the time when they shall be large enough to carry a cane and wear a tall hat; but let me tell you, little boys, what is a great deal better than money, and what you may be earning all the time you are waiting to grow large to earn a fortune. The Bible tells us that a "good name is rather to be chosen than riches, and loving favor rather than silver or gold." A good name does not mean a name for being the richest man in town, or for owning the largest house. A good name is a name for doing good deeds; a name for wearing a pleasant face, and carrying a cheerful heart; for always doing right, no matter what we may be.

IT IS A CURIOUS FACT.—Illustrating the necessity of cleanliness and of keeping the pores of the skin open, that if a coat of varnish or other substance impervious to moisture be applied to the exterior of the body, death will ensue in about six hours. The experiment was once tried on a child in Florence. On occasion of Pope Leo the Tenth's accession to the Papal chair, it was desired to have a living figure represent the Golden Age, and so a child was gilded all over with varnish and gold leaf. The child died in a few hours. If the fur of a rabbit or the skin of a pig be covered with a solution of india-rubber in naphtha, the animal ceases to breathe in a few hours.

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San Francisco:

Saturday Morning, April 5, 1873.

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MISCELLANEOUS.—Utah Smelting Furnaces; Discovery of Relics of an Ancient Civilization; Mineral Resources of Costa Rica; Montana Mining Prospects for 1873; Opal Deposits; Great Gypsum Discovery, 210. The Mendocino Company's Mines; Montana Ore Shipments; Pacific Coast Appropriations by Congress; Coal in India; A Wonderful Well at Pioche, 214. How to Dispose of Oatmeal; A Common Illusion; Sewing Machines; Chopped Hands; Better than Gold; It is a Curious Fact, 215. The Miner's Song; Prospecting in Australia; The Iron and Copper Mines of Ireland; Reported Strike, 218.

LAND OFFICE ORDER.—The commissioner-General of the Land Office on the 1st inst. sent instruction to the Register and Receiver to carry into effect the Act approved March 31, 1873, providing for the joint entry of agricultural land to two or more pre-emptory settlers prior to a survey of the same. A legal sub-division may elect one of their number to make an entry and contract for a private conveyance back to the company pre-empting, when the patents are received.

BULLION YIELD.—During the month of January the Comstock (eight mines) yielded \$1,242,919.82. This was from Belcher, Buckeye, Crown Point, Chollar, Hale & Norcross, Savage, Sierra Nevada and Kentuck. During the month of February seven mines (the list above given, less the Sierra Nevada) yielded \$1,684,068.88—\$441,149.55 more than in January.

NARROW GAUGE.—The Contra Costa Farmers' Club, at their last meeting, passed resolutions in favor of building a narrow-gauge railroad from Walnut Creek to tide-water at Oakland, and recommended the county of Contra Costa to give a subsidy of \$200,000, on condition that it is extended from Walnut Creek to Martinez, and from Walnut Creek to Limerick.

A MILITARY LIBRARY is being established in San Francisco by a corporation, having for its object the purpose of acquiring, preserving and conducting a public library, to consist chiefly of books, magazines and newspapers of a military character.

THOMAS L. MOORE, well-known in mining circles in this State, committed suicide at Salt Lake City on the 2d inst.

ON FILE.—Letter from "Old Block," on the Grass Valley mines.

The Emma Mine Troubles.

Both the English and Scotch shareholders in the Emma mine are terribly exercised over the turn affairs have taken in connection with that property. The report of the directors, which we published last week cannot be looked upon as encouraging, and they have come to the conclusion that the sum paid for the mine was greatly in excess of its real value. The very pertinent question is asked can an English management thousands of miles away make the property pay an adequate dividend on the £1,000,000 capital employed? The English papers said that Mr. Warren Hussey's management partook too much of an amateur character, but they hope that the ability and experience of Mr. Geo. Attwood, the new Superintendent will set matters straight. At all events they want some one here in whom they can rely for correct reports as to the condition and prospects of the mine, and the money realized from the sale of ore.

It has come to light at the last meeting that outside parties had more correct and earlier information than did the directors who were disbursing the dividends. These statements were so contradictory that the directors did not know which to believe, but on several occasions the outside reports were confirmed, while those of the Directors were untrue. The Chairman of the meeting deplored the speculative character of the stock but could suggest no remedy as the large amount, and the large number of shares spread all over the country combined to make it speculative. There seems to be no doubt but that reports were withheld from the directors which they should have had. The great falling off in the character of the ore since the cave, was stated to be "a very peculiar circumstance," for that extracted previous to the cave was rich, whereas since then the ore was low grade. Professor Silliman's predictions as to the amount and value of the ore have proved fallacious and as far as the Chairman of the meeting could understand, the altered condition and prospects of the mine arise from the fact that the ore on the foot-wall of the vein was very rich while that in other parts was poor.

The reasons given in the Directors' report for the unfavorable aspect of affairs are very simple. Thirteen monthly dividends were paid amounting to £193,532, while the balance sheet shows that only £185,657 were available for that purpose, leaving a deficiency of £7,784. This has arisen from the flooding of the issue in June and the litigation with the Illinois Tunnel. The total amount of ore accounted for and raised by the company since taking possession as set forth in the accounts, amounts to a total of 9,862 tons, yielding a gross amount of £167,532, or £17 per ton; of this 2,790 tons were sold in Europe at a gross, not net, profit of £29 10s. per ton; 6,532 tons were sold at Salt Lake, at a gross price of £11 19s. per ton; and 550 tons were sold at St. Louis at £12 6s. per ton. The expense on the ore at Salt Lake City amounted to £56,303, equal to £5 16s. per ton; that on the 2,790 tons sent to Europe, £24,823 or £8 4s. per ton; and the London management expenses were stated at £1 per ton or £12,420. Thus after deducting the expenses of £29 10s. per ton, a profit of only £14 10s. was shown. It turns out that the net profit on the 9,862 tons raised by the company and the 2,800 tons said to have been raised by the vendors only paid £11 per ton. It is stated as a "remarkable and somewhat significant fact" that the amount of ore on the dump and the first shipments of ore after the mine had been purchased, were the only parcels producing anything like a first-class price.

The majority of the shareholders seem to be angry because the glowing terms of the prospectus were not carried out. One stockholder said he had been induced by promises of realizing 72 per cent. to invest, and proposed a committee of investigation to ascertain the causes of the non-fulfillment of these promises. Who ever heard of a property of any kind which was placed on the market that realized in full all the promises of the vendors, especially one which was sold at a fancy price as the Emma has. The mine has only produced 9,802 tons in 13 months, realizing under £36,403, or after deducting London management expenses £74,000, or less than 7½ per cent. for the 13 months. Moreover they owe the Illinois tunnel and Mr. Park £50,000.

The Directors have acknowledged that they

made a mistake when they paid the 13th dividend, and as some atonement, have voluntarily passed a resolution to reduce their own fees to half the present amount, with the addition of one per cent. on the net profits, but the remuneration in no case to exceed the amount provided by the by-laws. The Glasgow shareholders have held a sort of indignation meeting, at which one of them suggested a feasible way out of future difficulties would be to have three of the eight directors residents at the mines. The Glasgow shareholders hauled the directors over the coals, but expressed faith in the mine itself, and appointed a committee to attend to the interests of the shareholders. They sent two of their number to represent their interests in London, who were, in deference to their wishes, appointed by the London meeting members of the Board of Directors.

There seems to have been a great complaint among the stockholders about the London management expenses, which have been pretty heavy. They wanted imposing names among their Board, and the imposing names must of course be paid for being there. And even with all this, many of the owners of stock became prejudiced against this Board, and even hint forcibly at a "committee of investigation." The Board acknowledged they were deceived and that the reports received by them were not always correct. They took the trouble to send out a representative privately to the mines, but he died in New York, so that measure fell through. Now they have sent Mr. George Attwood. They have now come to the conclusion to give up the weekly telegram as well as the regular monthly dividend, the shareholders preferring a quarterly dividend. One member of the company wanted to appoint, in lieu of a committee of investigation, a committee of conference, to advise with the Directors in any practical measures in relation to the mine, but his motion was not carried.

The whole meeting passed off much more quietly than it was supposed it would, the majority of the shareholders professing their confidence in the mine if it was properly managed. This is also the case among outsiders, and the London Mining Journal states that respectable parties in London offer to lease the mine for 12 months at £10,000 pounds per month (equal to 12 per cent. per annum). The great difficulty has been to get correct information from the mine, but the general impression prevails that the difficulty has been overcome in the appointment of Mr. Attwood as Superintendent. It is to be hoped that the affairs of the Emma will be straightened out properly, as it is unquestionably the representative American mine abroad, and if failure ensues we will have great difficulty in again procuring the assistance of English capital in our mines. It is with sincere regret that we note the tone of many shareholders in this and other mines in England, which evinces a distrust of all Americans on general principles. But they should recollect that they seldom buy a mine without the advice of English engineers, and there are dishonest men on one side of the ocean as well as the other. We all regret the fact that unprincipled men have occasionally taken advantage of circumstances to appropriate money not their own, and have run mines in their own interest and not that of stockholders, and have sold worthless property, which they represented as valuable.

No doubt these things have been done in England as well as here, but it is unfair and unjust to condemn wholesale a class of people for actions committed by one of their number.

RAYMOND & ELY SUIT.—The Raymond & Ely vs. Hermes mining suit, is still going on in Pioche. The court is engaged as yet in taking testimony, which seems to be voluminous. The last accounts from there were to the effect that the jury—orsome of them—had been down the mine examining it. The suit has depressed the Raymond & Ely stock to some extent.

FREIGHT OVERLAND.—According to the report of J. C. Stubbs, Assistant Freight Agent of the Central Pacific Railroad 2,200,812 pounds of freight were sent East in February, making a total for January and February of 5,950,112. Among the items for February was 50,940 pounds of quicksilver.

THE HOMESTEAD LAW.—The new homestead law passed by the 1st session of the last Congress in the Senate, and on the last day of the 2d session in the House, was lost by being on the bottom of the pile and not being acted upon by the President in the time allowed.

IRON ORE of excellent quality has been found on Vancouver Island.

Railroad Management.

Importance of Mechanical Science.

One of the great difficulties encountered in the management of railroads is found in the efforts to keep the track free from broken or dangerous rails; and no engineering problem is more important to the railroad interests than that involving the production of a good quality of iron or steel for railroad purposes generally. Notwithstanding all that the Bessemer process has accomplished, this question is far from being satisfactorily solved. This is a matter, also, in which all who travel by rail have a vital interest. The dangers of such travel are diminished in about the same ratio as progress is made in the solution of this question. We have just read, in an Eastern Railroad journal, that the master of a section on the Boston and Albany Railroad, reports to the Company that he finds seven or eight broken rails on his section nearly every day; and that is certainly not considered a badly managed road. It makes one shudder to read such a statement, or to think of the possibilities of the accidents which are liable to occur from the least neglect of duty on the part of the section master.

A more reliable quality of iron is also as much needed for axles and wheels as for rails; and notwithstanding experiments have covered a wide range of conditions and brands, of both English and American make, still no definite, practical conclusions have been arrived at in which all can concur as to the most reliable brands.

There is also a manifest indifference or lack of even reasonable caution shown on the part of the many railroad managers, which, if it was more generally known, would no doubt exert a depressing influence on railroad travel. Too little attention is also given to the qualifications of employees for responsible positions; and there is also much difficulty experienced in finding suitable persons to fill such positions. There are too few young men who are especially educated for the business. Probably the technical schools, which are now being so rapidly multiplied, and becoming so deservedly popular, may make an improvement in this particular in the course of a few years.

Another trouble arises from the fact that really good men are not paid enough to compensate them for the years of study necessary to properly fit them for such a responsible profession—for profession it should be called. A young man engaged on one of our Western railroads, and who is evidently wide-awake to every practical application of science and knowledge to the operation of railroad machinery, writes to the Chicago Railroad Journal, as follows: "Good men are not paid enough, and for this reason they are driven to seek more lucrative positions. I must say that I feel that way myself, and I am now giving my leisure time to the study of higher branches of railroading. I must either have more money for the service I am now performing or I shall seek another position. I like the machinery department best; it is my forte; but I am poor and must look for a business that will pay me better."

It is very well known, to every observing man, that there are many young men, in all parts of the country, occupying similar positions, not only in railroading but in all other mechanical employments, who feel much as does the one above alluded to, whose ambition is surely worthy of high commendation.

It should be the ambition of every mechanic to be able himself, to solve all the problems involved in his especial art. If not all, he should certainly have a sufficient knowledge of them, to be able to appeal confidently to scientific men, and point out to them the application, improvement or information he desires.

For example, the railroad superintendent, or officer should be able to go back to the ore and understand, at least theoretically, every process and manipulation to which that ore, has been subjected until it arrives in his yard or shop, a finished rail, axle, or plate of steel or iron for his locomotive boiler. He should be able to analyze—or intelligently secure that service from another—any bar or plate, and determine correctly its character and fitness for the service desired.

There is a most reprehensible remissness in such particulars. At a late meeting in Boston, of master mechanics, gathered from widely different districts, it transpired that no one present could give a complete history, from the ore to the end of the career of a single plate, rail or bar of either steel or iron, which they had used; no analysis of any plate was reported; no con-

ception could be formed of the percentage of carbon, or sulphur, or phosphorus, that was present in any plate that had been used for boiler purposes; no analysis of any fuel was given, or of the water used in any single instance.

When we have master mechanics of scientific attainments and proclivities, who will fully investigate matters of such importance, in a systematic and connected manner, reliable and complete data may be attained which will be of practical importance; but so long as we depend upon uncertain and disjointed experiences and observations merely, and that information gained under diverse circumstances, we can never hope to make much progress even in such vital matters as pertain to the lives and safety of the thousands of our citizens who are compelled to spend much of their time in traveling by steamboat and rail car.

The time has fully come when science is not to be confined to professional men—especially so-called. The inspiration of science should reach every individual in the great army of skilled labor. This fact is acknowledged in our own State, by making the State University at Oakland a part of our common school system.

What industry is there that does not need the help of an engineer; and why should any laborer, skilled or otherwise, rest content with the mere ordinary manipulation of what is placed in his hands? But if any one desires to become progressive, his inspiration must be enlightened by study, either before or after he enters upon his calling. It should be the object of employers and the press everywhere, to stir up the intellect of men; for surely an educated, reading, thinking man is worth more to his employer than a careless, listless one, who has no care or thought beyond the present; and such a one should receive more for his services. There is neither sense nor justice in the idea that every man of a trade should receive the same rate of wages. Every employer knows that some men are worth from fifty to a hundred per cent. more than others. Then why not make merit—intelligence and skill—the standard of the value of labor?

The true mission of the laboring man will be fulfilled only when every individual shall employ his intellect and leisure in so improving his mind, that he may thoroughly understand the principles which regulate the processes and practice of his especial handicraft.

Germany has taken the lead in carrying out this idea. Her mechanics are more thoroughly educated than those of any other nation. This is the result of her technical schools, which have been established all over the land—free to all. It was this training—this combination of science with practice—that made it possible for the armies of Germany to make their late triumphant "march to Paris." Almost every man in the ranks was competent to fill the position of an officer. The German host was an army of engineers. Their patriotism and courage was enlightened by study, which gave their weapons an efficiency and power not possessed by their equally well armed enemy.

OUR EXPORTS.—The *Alta* has compiled some financial and commercial statistics for the first quarter of the year 1873 showing the amount and destination of domestic produce exported. By reference to the tables we find that 2,040 flasks of quicksilver were sent away, valued at \$141,325 against 2,737 flasks in the same time in 1872, valued at \$196,800. Of this 201 flasks went to Central America; 632 flasks to Mexico; 1,000 flasks to Australia; 100 flasks to China; and 2 flasks to British Columbia. We sent away during the quarter 554 tons of copper ore valued at \$33,208; 248 tons of silver ore valued \$37,461 and 501 tons of various other kinds of ore valued \$38,427. These ore shipments have fallen off from 1872 which is rather encouraging, than otherwise, since we now work most of our ore here instead of sending them away.

The *Celavene Chronicle* cannot recollect a time for several years when business in that section was so lively as it is at present. The revival of quartz and gravel mining has a beneficial effect on all industries.

A new quartz mill is being built at the mouth of Cañon Creek, Nevada county, by Messrs. Sann and Bleikie, of this city.

Emerson's Diamond Stone Saw.

We have made frequent mention in our columns of the efficacy of Emerson's diamond stone saw, and now have an opportunity of placing before our readers an engraving of this novel and peculiar instrument. The use of diamonds or carbons for drilling and dressing stone, suggested their employment for sawing the same material, and to those acquainted with the use of black diamonds or carbon, it is scarcely necessary to explain what can be accomplished in carving stone. The great object to be attained was to hold the diamond so firmly, maintaining the grip so that at least $\frac{1}{4}$ or $\frac{1}{2}$ the size of the diamond could be forced through the stone. This gripping device had to be so constructed as not to change or "buckle" the saw blade, in order to be effective. The diamonds, which are all of an irregular form, as nature left them, present sharp, rugged corners and jagged forms, but they had to be set uniformly, so as to give a small clearance for the saw, but not half that required in sawing wood, there being no fibre to stone. Their corners must project exactly alike, so that they will follow each other in their course, in order to leave a perfectly smooth surface. Sufficient has already been done to demonstrate that sawing stone with diamonds excels other processes.

Our engravings afford a clear idea of the device which accomplishes these effects, rendering a very detailed explanation unnecessary. Fig. 1, gives an edge view of a saw in its full size.

field holders of sandstone have repeatedly been crowded through the saw by hand, the saw cutting four inches deep at the rate of one inch per second, and that with only six diamonds cutting; and it is asserted that not a diamond has ever come loose, or any part of the fastening given away. The use of these black diamonds is varied and effective, for they have been applied to glass cutting, for turning of solid emery wheels (and the solid emery wheel cuts every other substance known in the mineral or metal kingdom); for dressing burrstones, and for rock drilling and dressing, including the hardest flint, quartz and granite, and lastly in sawing stone.

The patent adjustable holders are manufactured by Emerson, Ford & Co. of Beaver Falls, Pa., who offer State, county or city rights for sale.

University of California.

At the last meeting of the Board of Regents of the State University on the 1st inst., the contract was let for building the College of Letters.

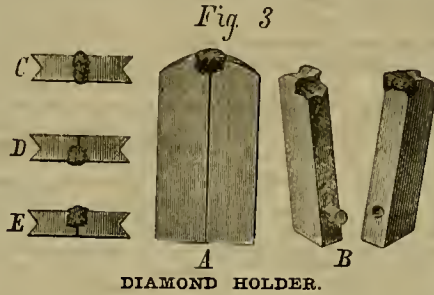
The lowest bid was \$83,750, the building to be completed Sept. 20th 1873. A peculiar circumstance connected with this is that the successful contractors have assumed the Committee that whatever profits they

derive above the cost of the structure they will donate to the University.

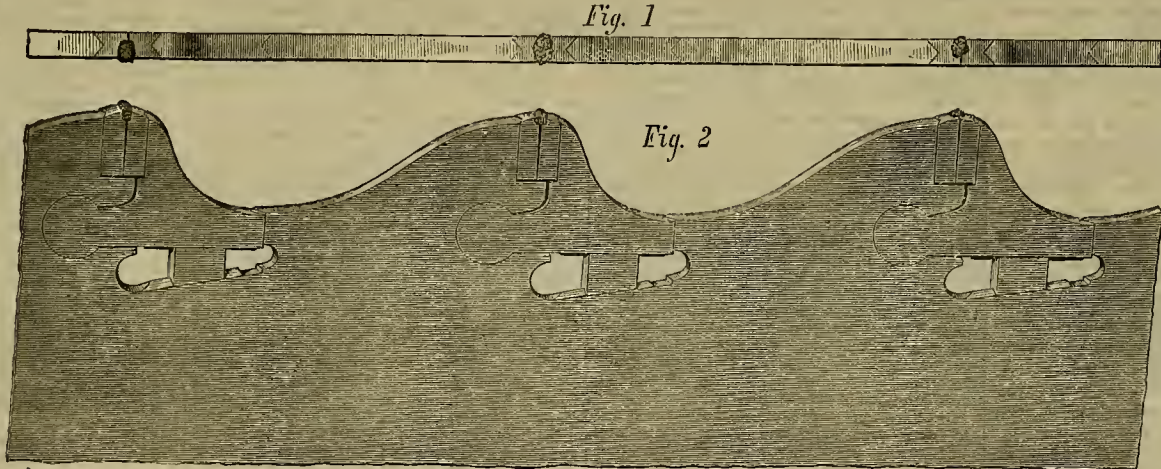
President Gilman announced the following valuable donations to the University:

From George M. Blake, ten acres of land adjoining the Berkeley site. The land is valued at about \$1,000 an acre.

From D. O. Mills, a rare cabinet of mineral ores, fossils, stones, etc., being a collection of



DIAMOND HOLDER.



EMERSON'S PATENT STONE SAW.

Fig. 2, is a section in perspective. Fig. 3, represents the diamond holder, of which A, exhibits the appearance of a side; B, a perspective view; and C, D, and E, the different shapes of diamonds used. The solid steel holders are made adjustable and interchangeable in the saw. It is claimed that in gripping the diamond they hold its jagged sides imbedded with such firmness that the cast-steel will be torn asunder before the carbon will work loose. The mode of confining the holders, it is also asserted, does not in any way tend to change or buckle the blade. The device is equally applicable to circular and reciprocating saws; it was patented by Mr. J. E. Emerson, the inventor of inserted-tooth saws for lumber.

A test of the operation of this system was made with a 12-inch circular saw, carrying six diamonds, and running on an average of 2,500 revolutions per minute. A piece of Italian marble three inches thick and four feet long was sawed through in one minute; and of Berea grindstone, three inches thick and five feet long, in one minute. The same saw has been on eight exhibitions, sawing various kinds of stone, including Quincy granite, and it is said that not a diamond has even moved, nor did they show under the magnifying glass, any perceptible wear. It is, of course, designed to use a small stream of water either on the saw or in the kerf while it is cutting. In marble cutting it is said that the diamonds cost less than the iron blades and sand. The marble dust is saved pure, while in sand sawing it is lost. This invention is also applicable to turning round on irregular forms. The tests that have been made were far more severe than would be required of a saw in practical use. Irregular

many years by C. D. Voy, and showing especially the geology and mineralogy of the Pacific Coast; number of specimens, 7,927; cost, \$5,000.

From Michael Reese, the library of the late Dr. F. Lieber, consisting of 3,000 volumes; cost, \$2,000. It is also stated that Mr. Reese will purchase a large and select library for the University when he is in Europe, where he intends making a visit shortly.

Donation of \$1,500 from Captain W. H. Reynolds, \$500 from C. W. Howard and \$500 from Henry D. Bacon for the purchase of educational apparatus, diagrams, maps, books, etc.

From the Mechanics' Institute a collection of Japanese minerals and metals of industrial arts.

From Louis Janin, a contribution of mineral ores.

From S. F. Butterworth, bound volumes of the New York Times from its first number to the close of the war.

From H. J. Booth & Co., of the Union Iron Foundry, a five-stamp battery and mill, with all the latest improvements. We hope this last gift will form a nucleus of a fine and varied set of mining machinery for the use of the School of Mines.

The committee appointed on the Medical Department Subject presented a report recommending the establishment of a series of chairs in the department to be filled by the Board. They recommend that in perpetual recognition of the munificence of Dr. H. H. Toland, one of the chairs in the Medical Department, to be designated by him, shall be known as the Toland Professorship; and further, that a suitable inscription be placed upon the Medical Hall which he has given, designating it as the Toland Medical Hall.

PATENTS & INVENTIONS.

Telegraphic List of U. S. Patents Issued to Pacific Coast Inventors.

(REPORTED OFFICIALLY FOR THE MINING AND SCIENTIFIC PRESS, DEWEY & CO., PUBLISHERS AND U. S. AND FOREIGN PATENT AGENTS.)

By Special Dispatch, Dated Washington, D. C. April 1st, 1873.

FOR WEEK ENDING MARCH 18th, 1873.

CAR COUPLING.—George Withington, of Ione City, Cal., and Frank F. Taylor, S. F., Cal. CANNELSTICK.—Amos E. Rogers, La Grande, Oregon.

REISSUE.

LUBRICATOR.—William T. Garratt, S. F., Cal.

"The patents are not ready for delivery by the Patent Office until some 14 days after the date of issue. Note.—Copies of U. S. and Foreign Patents furnished by DEWEY & CO., in the shortest time possible (by telegraph or otherwise) at the lowest rates. All patent business for Pacific coast inventors transacted with greater security and in much less time than by any other agency.

The Vienna Exposition.

The following gentlemen have been appointed by the President to attend the Vienna exhibition, under the joint resolution of Congress, approved February 14, 1873:

Practical Artisans—N. M. Lowe, Mass.; Chas. Davis, Pa.; Jos. V. Meigs, Mass.; R. B. Lines, D. C.; John R. Nurse, Md.; Louis J. Hinton, N. Y.; Lyman Bridges, Ill.; George A. Stanberry, Ohio.

Scientific Men—E. N. Horsford, Mass.; J. Lawrence Smith, Ky.; Lewis M. Rutherford, N. Y.; Peter Collier, Vt.; R. H. Thurston, N. J.; L. J. Boeck, Va.; John A. Warder, Ohio.

Honorary Commissioners—J. Dawson Coleman, of Penn.; Thomas Nast, New Jersey; Dr. J. W. Hoyt, Wisconsin; J. H. Speed, Alabama; Frank Drexler, Alabama; A. McDonald, Arkansas; J. Newman, California; George W. Parker, J. K. Kilbourn, Joseph Plant, E. S. Wheeler, Connecticut; W. C. Bibb, Edwin D. Newton, Georgia; J. M. Gregory, Allen W. Stolp, Illinois; Jesse S. Brown, A. Ballweg, Indiana; James A. Williamson, A. F. Hofer, G. T. Carpenter, Samuel F. Cooper, Iowa; Henry Tarstedt, Kansas; C. F. Carpenter, Kentucky; Frank Morey, Henry Vignand, Louisiana; J. Edwin Therwan, Maine; W. T. Walters, Maryland; J. D. Philbrick, Nelson L. Darley, L. F. Melten, Henry Marian Howe, D. A. Goddard, Louis Weisbein, Massachusetts; James Pirney, Henry C. Louis, Michigan; Col. Edward P. Jones, Augustus Senige, Mississippi; H. C. Creveling, G. H. Koch, Charles A. Smith, Missouri; H. J. Wisner, John A. Van Winkle, John Duncan, G. Dewitt, N. J.; Prof. Davies, G. Saner, I. W. Rogers, Wm. C. Ginnell, J. H. Sherwood, Francis A. Stont, George W. Silcox, R. W. Raymond, Jackson S.

Schultz, Douglas Taylor, George Thnrer, New York; W. C. Kerr, North Carolina; Montgomery Phister, O. G. Leopold, Freeman Thorpe, G. Mandenhall, Ohio; Charles E. Smith, Oregon; Howard Painter, Thomas Beauer, John Shion, Henry D. Moore, David Brooke, Joseph Wharton, J. Milliken, Charles M. Nes, Pennsylvania; Elisha Dyer, Rhode Island; Samuel Tate, L. G. Dupre, Tennessee; C. S. Morrill, Levi K. Fuller, Vermont; Moses P. Handy, Virginia; J. H. D. Debar, West Virginia; Geo. W. Smalley, J. Russell Young, Benj. R. Winthrop, Charles K. Tuckerman, Dr. Thomas Binkler, at large; E. M. Hamilton, Colorado; Richard K. Evans, Richard D. Cntis, David Edes, Joseph Enthoffer, Arthur H. Brown, District of Columbia; James M. Cavaoagh, Montana; Adolph Guttman, New Mexico.

BOILER INSPECTOR.—James Hillman has been appointed Boiler Inspector for this District. Mr. H. was for some time Superintendent of the shops at Mare Island, but latterly has been overseer of machinery for the Pacific Mail Steamship Company.

GILROY is the seat of the latest quicksilver discoveries, three "chimneys" having been found recently.

THE JURY on the Raymond & Ely suit has visited the mine for the purpose of examining it.

It is proposed to establish an artificial ice manufactory in this city shortly.

MAPLE SUON is now being made in Sierra County Cal.

The Miner's Song.

BY J. O. SEVERANCE.

I toll in "vein"—the life I "lead"
Up here in Deadwood Canon,
Will never pay unless with speed,
I "pan out" a com—"pan" ion.
I "struck" a "specimen" that cuttle—
Her "lead" I've been "a-trying"
Since first the beauty of the "hutes"
Came down my "race" s-racing.

The "color showed" upon her cheeks,
Her eyes "cropped out" with frolic;
Her hair sprayed out in golden streaks
On high, like my "by"—dreadful.
To test her worth I made "sassy";
Found her o're stubborn, rather;
And under par. I went away—
Not far—to see her father.

I sought him with a bitter green;
His love for gold was mighty.
The only "Cupid" he had known
Was winged with s-t-y-t-y.
"What 'prospects' have you got, young man?"
Said he with scornful titter;
And when I said, to every "pan"
A bit, he was less bitter.

I "staked my claim" so very bold,
It warmed his heart of "houlder";
He said, let wedding bells be tolled!
And then I went and told her.
We "made the rifle" quick, you bet!
For I believed it better
To have the "record" made, while yet
The "parent vein" would let her.

Now she is won—we both are one;
Of love and gold the hoarders;
We swim in happiness and fun,
Content, like Swinney's hoarders.
And in the "cut" she "kisses"
She places—"just to please pa!"
I may as well "own up the cheese"—
A little nine pound "chips"—

—Call.

An Important Invention.

A short time since we made mention of an invention by Mr. D. Morey, of Watsonville, of an attachment to threshing machines, by which the straw may be used as fuel for running the engine.

We recently, in company with a number of scientific gentlemen, had the pleasure of witnessing a test of this invention, on the premises of Mr. H. W. Rice, a well known machinist at Haywood, which gave the utmost satisfaction, and promises to be the most economical machine that can be used on a farm. The object of this invention is to utilize straw as fuel for the purpose of generating steam, instead of wood or coal. The attachment is exceedingly simple in its construction, made of heavy sheet iron, and weighs when completed only 75 pounds. All that is necessary to put the machine in working order is to open the furnace door, attach the machine by a hasp to the door catch, and two small rods of iron to the hinges of the door, when it is ready for operation. This may be removed whenever desired in a few minutes time. About three hundred pounds of dry wheat straw having been brought to the machine and a feed fork full thrust into the furnace which was cold, (not having been in use for some time), the fire was started and in precisely thirty minutes, steam was raised, in forty minutes from starting the fire, the steam gauge indicated forty pounds pressure, and in forty seven minutes, seventy pounds.

At the expiration of one hour but 150 pounds of straw had been consumed; in the meantime the power had been used running two engine lathes, an iron planer, drill press, and grindstone; the pump being put on the boiler was quickly filled with water to its utmost capacity without diminishing the pressure. The machine having been tested to the satisfaction of all present, Mr. Rice, desiring to operate his engine lathes, planer, drill press, etc., kept up steam for six hours, consuming in that time only 200 pounds of straw, proving that one ton of straw per day would be amply sufficient to run the thrasher. Even were five tons of straw per day necessary it will be a vast saving to the farmer, who invariably burns the bulk of his straw to get it out of the way.

Straw has been proved to be a superior fuel for the threshing engine, when properly used; it makes a very hot fire, the whole interior of the furnace being filled with a roaring flame which sweeps through the flues and heating the water in a remarkably short time. To run a threshing machine it requires only one-twentieth of the straw from a separator, and a boy twelve years of age can attend to the straw feeder with ease, or for that matter the engineer will have no difficulty in attending to the feeder himself.

There are also many advantages from using straw; there are no sparks, and of course there is no need of a "spark arrester"—no danger of setting stacks or stubble on fire; furthermore, the fire from straw does not burn the iron as does that from redwood; there being no cinders it is very little trouble to clean the flues.

Mr. Morey has expended considerable time

and money in experimenting, and is now rewarded by the invention of an appliance, that will revolutionize the threshing of grain, and save a vast amount of money yearly to the farmer in the way of wood, especially in localities where wood is scarce. Mr. Morey procured his patent through the agency of Dewey and Co., and is now prepared to receive orders for his attachment.

Prospecting in Australia.

The Rev. W. B. Clarke has delivered an address to the Royal Society of New South Wales, at their late anniversary meeting, on their diamond-fields. It seems there are now twelve localities in Australia known to be diamondiferous. Of these five are in New South Wales, five in Victoria, and two in South Australia. The latest discovered sites are those of the Hoxton river, those of the Macquarie, a little below Bathurst, and those at the head of the Fish river, which is, in fact, the Macquarie. Thus the last named stream bears diamonds, at intervals, for the space of many miles. The idea that diamonds will lose their commercial value, if found in such abundance as at the Cape, is no longer prevalent. Castellan, indeed, predicts "that at the end of the present century the diamond will be worth only 20 per cent. of its value in 1800." The diamond, however, is not intended for a mere ornament—for a simple article of luxury. It has other and far higher functions to perform. By the method of cutting rocks by means of the diamond drill—which was first used on the Bologna railway, in Italy, and afterwards in the excavation of the Mont Cenis tunnel—means have been found for utilizing and disposing of the small stones, which constitute by far the greater product of all diggings. It is probable, therefore, that when new fields have been discovered, when every fresh return shows an increase in the value of exported diamonds, that they will come into far more active and general use. Mr. Daintree, Agent-General for Queensland, who was wrecked on the Southern Coast of Africa, on his voyage to Britain, noticed the prevalence of an agate conglomerate from the drift of the Vaal, which reminded him strongly of a like conglomerate on the Gilbert river, where he had been engaged in exploring. Since that time the Government has offered a reward for the discovery of a diamond field in Queensland. It is satisfactory to know that the production of gold in Australia is also on the increase. As regards the ill-starred expedition to New Guinea—while deprecating the rashness and precipitancy of the undertaking—Mr. Clarke recommends prospecting nearer home. Even in the neighborhood of the gold fields there are many "reefs" as yet untouched, and there is every reason to believe that some will be productive. It must be born in mind, too, that wherever there are certain rocks of igneous origin, such as diorite, felspathic veins, or felstones, in company with pyritic minerals, it is certain that the precious metal is not far off. At the same time miners have begun to realize the truth that many theoretical views relating to the nature of gold-bearing rocks are only partially reliable. For example, as a rich reef has recently been struck at a depth of 800 feet, those who hold the theory of shallow reefs will have to give up their views.

Of tin and copper there are sources now considerably drawn upon, and likely before long to affect the English market. It seems that these metals are as abundant in Australia as in Cornwall. Respecting the development of copper, its appearance in great abundance in the far western interior has been made known during the past year. Captain Sturt, when pursuing his explorations beyond the Darling, found an inhospitable desert, where there was nothing but low ridges, level plains, and scanty vegetation. The commissioner of Crown lands in the Albert District, has since notified to Mr. Clarke the presence of copper and magnetic iron ore in large quantities throughout this desert waste. It is hoped that both the Government and the community will give their utmost attention to the practical management of these treasures. Errors will only lead to great difficulties and corresponding inconvenience. We may now look forward with confidence to the time when the Courtandie, Malia, and Coonharaba Ranges of the Barrier will swell the mineral riches of Australia. A very rich conglomerate of gold, silver and copper seems to have been discovered in Gympie. Copper has also been found in Maneero, alloyed with antimony. Mr. Clarke has a specimen from Bathurst with eighteen ores and minerals combined. But he adds, "in general such combinations are not promising." Among other specimens forwarded from Australia to England there is a beautiful sample of the precious opal, taken from a hill in Secondary Rock near the head of Bulla Creek. Whether or no this mineral will ever come to be profitable is still doubtful; but it is worthy of notice for its lustre. The result of Mr. Clarke's investigation is noble in the extreme. He has often stated Eastern Australia to be one vast field of mineral wealth; we have now evidence to the truth of his statements. From north to south, and from the coast to the 141st meridian, the western boundary of New South Wales, we know that besides the more valuable metals—gold, copper, tin and lead—there is in many places an abundance of coal, and other minerals of less local importance.—Iron.

The Iron and Copper Mines of Ireland.

The iron and copper mines of Ireland are nearly all found in the South. The mineral wealth of County Cork exceeds that of any other county of Ireland, as will be seen from the following facts which we have compiled from the most authentic sources. The Cooshen mine was worked so extensively thirty years ago, that solid copper ore to the value of £20,000 was raised and sold. There are six parallel lodes in this mine, within a distance of 150 or 200 fathoms, and they are a continuation of the great belt or zone of copper lodes traversing the district from Aughdown to Brow Head. Cargoes of ore from this mine have been sold at Swansea at £38 per ton. To the east of Cooshen is Ordentenant mine. An adit level was commenced many years ago in this mine, and driven north in mineralized ground, with a view of intersecting the lodes of Cooshen, but it was stopped short when within a few fathoms of the principal lodes. To the east is Ballycummish mine, which has been worked for a number of years, and has been sunk to a depth of 210 fathoms. Upwards of £50,000 worth of copper ore have been raised and sold from this mine. A prospectus has recently been issued for the formation of a company for working Ballycummish and Cooshen mines, in which it is stated that such an undertaking is practically beyond the reach of private enterprise, and that there are now in the former mine about 2,000 tons of ore in stopes ready to be raised. About a mile to the east of Ballycummish is the celebrated Old Andley or Cappagh mine. It is furnished with powerful machinery, and is within half-a-mile of a shipping place. The main shaft has been sunk to a depth of 115 fathoms, and has produced £60,000 worth of copper ore. Samples of the ore recently assayed by Messrs. Johnson and Son, assayers to the Mint, yielded 87 ounces of silver to the ton of ore, and the aniferous copper ores yielded 20oz. 5dwts. 17grs.; 12dwts. and 12½dwts. respectively per ton of ore. The East Cappagh mine is not the same run of lodes as that of Cappagh, and yields a rich percentage of silver and copper. The east shaft has been sunk about 50 fathoms perpendicular, and the west shaft 30 fathoms; there is, therefore, a block of the lode standing between the two shafts, 40 fathoms high and 36 fathoms long; also a block of ore ground 35 fathoms high to the west of the west shaft.

The great chain of mountains beginning at the Mizen and Three Castle Heads, and facing the Atlantic Ocean, forms a copper zone, or belt of lodes, for a distance of between twenty and thirty miles; and in every place between the extreme points, where trials have been made, rich copper ore has been discovered. The Mizen Head lodes strike through Collins's Mine, near Goleen, in which an adit level has been driven a considerable distance on the course of the lode, and a main shaft sunk under the adit thirty fathoms. The copper lodes at Three Castle Head crop out in the cliffs, and contain fine specimens of yellow copper ore, quartz, etc. Dhorode copper mine, to the east of Three Castle Head, was opened in 1843, and several cargoes of yellow copper ore were raised and sold. On the eastern slope of the mountain range a valuable deposit of the sulphate of barytes has been discovered. The next are the Baudon Barytes Mines. The barytes in this mine is pure sulphate of baryta, thousands of tons of which have been shipped to England. At a short distance south of the engine-shaft the barytes lode is intersected by an east and west copper lode; and indications of copper ore have recently been observed in contact with the barytes lode, near the engine shaft. The foregoing are a few facts connected with the mineral resources of Ireland. From this, and similar testimony, which has from time to time been disclosed, it is evident that Ireland abounds with mineral wealth; and we venture to hope that at a time not far distant the people of Ireland will exert themselves, and utilize their own natural resources, instead of being dependent upon other countries for those things which they themselves possess.—Iron.

REPORTED STRIKE.—The Territorial Enterprise, of the 29th, says: A report is current that a fine body of ore has been developed on the 1,600-foot level of the Savage mine. The width of the deposit found is variously given. Some say it is four feet in width, while others will have it no less than twelve feet wide. Be the width what it may, it is pretty generally conceded that a really valuable deposit of ore has been found. A gentleman yesterday informed us that three assays were shown him, that were said to have been made from ore taken from the new body at random, the lowest of which was \$260 per ton. If they have plenty of ore that will assay \$60 per ton, we will say nothing about the little \$200 extra. We hope that all that is said and surmised about the development may prove true, but these things must be taken with a few grains of allowance; particularly at a time like the present, when men's wishes are not only the fathers of their thoughts, but also of most of their reports.

CROWN POINT.—The Crown Point Mining Company shipped on the 27th, to London, England, through Wells, Fargo & Co., thirty-two bars of bullion, valued at \$96,397.90.

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Remittances of money, made by individual inventors to the Government, sometimes miscarry, and it has repeatedly happened that applicants have not only lost their money, but their inventions also, from this cause and consequent delay. We hold ourselves responsible for all fees entrusted to our agency. The principal portion of the patent business of this coast has been done, and is still being done, through our agency. We are familiar with, and have full records, of all former cases, and can more directly judge of the value and patentability of inventions discovered here than any other agents.

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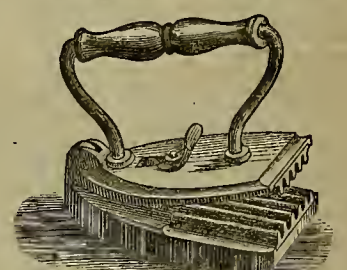


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[Continued from Page 213.]

Though large bodies of good ore have been in sight for some time in the deepest works, it is only within the last day or two that the very high grade metal has come in.

WASHOE.
HALE & NONOCOS.—Gold Hill News, March 29: About the usual amount of good ore is being extracted from the ore-breasts on the 800-ft. level, also the 1,400-ft. and 1,600-ft. levels, which continue to look and yield finely. A new section has been opened in the north or engine winze at the 1,600-ft. level, where the ore body has opened out 12 ft. in width of fine quality. The raise on the ore vein struck at the opening of the 1,700-ft. station is making good headway, the ore gradually widening out from 3 ft. where it was found until it is now 11 ft. in width and of excellent quality.

SAVAGE.—The main shaft drift on the 1,600-ft. level is still driven energetically ahead, the drift progressing at the rate of 5 ft. per day. The first cross-cut west from this drift, 150 ft. south of the incline, during the week cut through what appears to be the southern terminus of a body of \$30 milling ore, 7 ft. thick.

CON. VINOIMA.—Work in the prospecting cross-cut on this level is nearly suspended for the present on account of the intense heat encountered as soon as the shaft gets to a few feet away from the main drift. The shaft is now down 284 ft. below the 500-ft. level.

GOLD & CURRY.—The north drift from the main east drift on the 1,500-ft. level is still driven ahead, the face in fine favorable looking quartz, but no ore of any consequence. The main south drift on the 1,600-ft. level to connect with the north drift on the same level from the Savage, is in excellent progress, the rock in the face working finely.

CHOLAR-PORT.—Daily yield 150 tons of ore, the assay value of which is \$35 per ton. Work has been resumed in the different ore-breasts of the old works which are both looking and yielding well.

BROCKEY.—The Hope mill was again started up last Monday, and has been steadily running on ore from the mine since that time. The new ore-breasts in the south drift at the first station are opening out finely, and promise a goodly yield of ore for the future.

JULIA.—The cross-cut south from the main west drift is in 69 ft., the face in good ore, the ore vein having gradually opened out from 18 inches, where it was first struck, to 18 ft. in width, and giving promise of a fine development.

CHOLAR-PORT.—The new cross-cut from the main tunnel to connect with the old upper works is up 100 ft., cutting through, during the week, a body of excellent ore.

SURRO TUNNEL.—Total length, 3,745 ft. Good progress is made with the heading. The face is in hard, dry rock, which works well.

BECKER.—The main incline is down 90 ft. below the 1,200-ft. level. The main drift south, at this level, is in 318 ft. from the Crown Point line, and the drift north to meet it, from the incline, is in 184 ft. The main south drift, at the 1,400-ft. level, is again being pushed ahead. The cross-cut east from it is in 59 ft. with about 25 ft. of good ore. About 60 tons per day comes from this level through the Yellow Jacket shaft.

CAWON POINT.—The yield of the week was less than usual, by reason of repairs to the holding arrangements. All the ore-breasts are looking as well as usual. The main east cross-cut at the 1,300-ft. level is discontinued, having reached the east wall, with a good showing of ore all the way. The floors at this level are looking splendidly. The south drift at the 1,400-ft. level is being timbered. The main incline is now down 117 ft. below the 1,400-ft. level, in dry, hard rock.

YELLOW JACKET.—Work at the 1,500-ft. level, east drift, is still delayed by reason of too much water. Drift north at the 1,400-ft. level going ahead with very favorable indications.

ALAMO.—The shaft is down 42 ft. the full size still in good ore, fair progress being made, although the ore requires continual blasting.

WHITE PINE.

WARD BECKER.—White Pine News, March, 29: For a long time many miners have argued, that the pitch of the ore body on Treasure Hill was easterly, but until the work done on the Edgar shaft, one of the locations embraced in the Ward Becker Con., the majority steadily adhered to the theory that the lead pitched west. Their conclusion was founded entirely on surface work, which showed a broken mass of limestone evidently laying in a horizontal position, that plainly was the result of some great upheaval which at some remote period has broken up the immense mountain, leaving a mass of debris or broken rock on its outer or western slope. The fallacy of this theory has been fully and fairly demonstrated by the workings of the present mine. Entering at a drift below Main street, one west from the Edgar shaft, we pass through first the broken masses of limestone, mentioned above, which lay flat, and thence in through this formation a distance of 20 or 30 feet, we came to rock a little more solidified, where we notice the layers or seams pitch to the west; further on the rock begins to assume a permanent and solid character, when we commence to discover patches of ore here and there, with the ledge pitching due east, inclining downward at an angle of from 20 to 30 degrees.

Following down an incline we strike the first level, a distance of 121 feet from the surface, which leads us into the Edgar chamber. This famous chamber is some 40 feet in height, and a vein of ore has been found to the width of 40 or 60 feet. The Big Smoky mill was run on the ore taken from this chamber during last summer, and the amount is not yet exhausted. Going down from this level in the Edgar shaft, which commenced at the surface, 141 ft. above and has been sunk to the depth of 151 ft., cutting in its downward course one of the most permanent appearing veins of ore ever found in Treasure Hill. Work is still being prosecuted in this shaft to a lower depth. Proceeding due east, we arrive at the first winze, sunk now a depth of 20 ft., and ascending a body of ore of the same width, 40 ft., as found in the Edgar chamber.

There is now a large dump of first-class ore, averaging \$60 and \$70 per ton, which is only awaiting good roads to be transported to the mills for crushing. Work on the Hidden Treasure and other mines belonging to this company is being pushed forward with energy and good results.

Idaho.

SOUTH CHARIOT.—Owyhee Avalanche, March 22: No rich body of ore has yet been reached in either of the drifts, but we expect that something good will be struck in the 8th level before our next issue. The 6th level drift has just crossed a large slip, and a heavy volume of water is coming out of the vein, plainly indicating a large vein ahead.

MAHOGANY.—The slopes above the 6th level, in this mine are now yielding a fine quality of ore. The 7th level is opened for a distance of 114 ft. south of the shaft, timbered ready for stoping and carrying splendid looking ore in the face of the drift. The Cosmes mill is running on Mahogany ore.

RED JACKET.—This mine is at present one of the most promising in camp, and continues to open up well. The winze from the 1st to the 2d level is being put down rapidly, and shows big grade ore. The slopes are looking well and show a large vein. The adit level is being pushed ahead as fast as possible.

MINNESOTA.—The 1st, 2d and 3d levels are being pushed north with the utmost activity. The first is in 165 ft., showing good ore for the last 30 ft.; the 2d is in 300 ft., displaying fine looking ore in the face of the drift; the 3d is in 165 ft., the ore looking about the same as in the 2d. The 3d level is now down 68 ft. The ore is being hauled to the Owyhee mill.

INA ELMORE.—This mine shows much improvement in the lower levels, and considerable ore is being raised daily. There is every encouragement to expect

that an extensive body of rich ore will be opened out in the next level of this mine. The ore in the lowest workings shows more free gold than has any of the upper levels, since the famous rich deposit near the surface.

GOLDEN CHARIOT.—We believe that no work, except by contract is being done in this mine at present.

ILLINOIS CENTRAL.—This mine continues to yield a rich quality of ore.

Montana.

NEW DISCOVERY.—Rocky Mountain News, March 19: We learn that a very gravel bed, running north and south for some 20 miles, bearing every evidence of having been the old channel of the Missouri river, was recently discovered, 10 miles east of Diamond city, known as Gravelly Range, and that several men have been at work sinking shafts and prospecting with every evidence of a rich placer mine. Shafts to the depth of 70 ft. have been sunk through the gravel without yet finding bed rock, owing to water rising and driving the workmen out of the diggings. A good working prospect has been obtained, and the discoverers and owners propose to open up the claims and turn a ditch in from Deep Creek this season.

KEARAGE.—Montanian, March 20: The new Co. have been hitting ore from this lode, at Summit, nearly all winter, and at no time have been dependent on proving the lead a good one but a few days since their hopes were considerably brightened on washing a panful of crevice dirt, to find \$192 of fine gold as a result of the wash.

Philipsburg Correspondence New North West, March 22: There are two tunnels being driven vigorously. One is located near town by McLeod, Duffey, Kussell and others. They are running on the 8-hour system. The tunnel is in nearly 300 ft., and the prospects fair. The Flint Creek Tunnel on Frost Creek, running through Trout Hill, is in over 80 ft., and has entered a large vein over 70 ft., and only one wall is found yet, so the width of it is not known.

Vienna World's Exposition.

[From Our Correspondent at Vienna.—G. K. VEREL.]

On my arrival in New York I called at the office of the agency of the Vienna World's Exposition, for the purpose of securing space for a mineral collection from the mining districts of Utah Territory. There I was informed that quite a number of applications for space for American articles had been made, but California did not take a prominent part in it. It seems that neither General Van Buren, nor the Governors, nor the press were much engaged in encouraging the representation of our industry in the World's Fair. The first that we heard of Van Buren's circular was through the MINING AND SCIENTIFIC PRESS, taken from a London paper. It is interesting to see to what extent

American Products

Find their way even to Hungary. The *Pester Lloyd* of February, 1873, says: "America seems to make herself more and more indispensable to us. After being provided with cotton, furs, meat and meat extract, bacon, lard, hides, barley, preserved fruit, she sends us now also cheese. The latter has the form of a mill stone, each weighing 60 pounds, similar in taste to our old, in former times known as Elbinger, cheese." Doubtless there are many other things yet exported from the United States not mentioned by the *Lloyd*, as coal oil, tools, etc., but certainly more would be imported, if the German and Austrian people were more acquainted with the different articles manufactured in the United States; and no better opportunity for this purpose will be offered than with the Vienna Exposition.

Crossing the sea from Hull, England, to Hamburg, the steamer "Sprite" was crowded with large agricultural machines, (from Lincoln, England,) destined to Austria. English steam-plows are used in Austria and Hungary and of late the progress in these countries in manufacturing and agricultural industry and commerce is quite striking. All this proves that there is a field for trading extending every year further east.

By the way, for the benefit of

Travelers to Vienna,

I would mention that, going from New York by way of England, the steamers of the Inman Line are not the most comfortable ones. Being used to the neatness and strict order on our Pacific steamers, one is quite surprised to find a marked difference in this respect on the "City of Antwerp" of the Inman Line to Liverpool. The first cabins are partly dark, the very annoying ship smell, strong. The cabins are not examined by the Captain at all during the whole trip; and table poor enough, if compared with the luxuries of the German steamers between

New York and Hamburg.

These steamers are built in England and run as fast as the best of the "White Star" Line. The cabins are very elegant, and accommodations cannot be better. Even the second-class cabins are preferable to the first of the Inman Line. With the passenger train from Hamburg, it takes about 30 hours to Vienna, (\$12.50) by way of Berlin; but it takes less time with the fast train (*Currier Zug*). The expenses in Vienna during the exhibition will not be so extravagant as generally represented. A person, being compelled to economize takes a private room, can manage with three dollars (coin) a day; in a hotel, with five dollars, but it is unnecessary to say that ten times more can be spent in less than 24 hours.

It is said that among the prominent personages who will be present at the exhibition are the Emperors of Russia and Germany, Queen Victoria, the Kings of Italy, of Belgium, of Denmark, Sweden, Greece, Wur-

temberg, Bavaria, Saxony, the Sultan, the Shah of Persia, Grand Duke of Baden, President Grant, Thiers and the Prince of Wales. The Shah will be accompanied by four princes and suite, probably the Mikado of Japan will be also present. Of inferior beings, but of noble race, from Tunis, Africa, 20 most exquisite selected Arabian horses will be shipped to the Exposition. It is also announced by telegraph that the steamer "Phase" sailed from Japan with Japanese articles.

It may be of interest to your readers to see a

Comparison of Space

Occupied by different countries in the World's Expositions of London, Paris and Vienna. Italy had in London 1,800, in Paris, 2,200, in Vienna, 4,788 square meters; Russia had in London, 1,400, in Paris, 2,232, in Vienna, 5,090; Germany had in London, 3,500, in Paris, 8,790, in Vienna, 21,136; the East had in London, 1,450, in Paris 2,547, in Vienna, 5,672. France occupied, in 1867, in Paris, 48,837 square meters; Austria-Hungary, occupied, in Vienna, in 1873, 65,212 square meters.

The finishing up of the Palace is progressing very rapidly. Seeing the plans and pictures of the building, one is surprised, nevertheless, with the grandeur of structure and space on entering. In my next I will send you some interesting views.

Vienna, February 28, 1873.

The Coinage Act.

The new Coinage Act went into operation April 1st. The Mint of the United States is established as a Bureau of the Treasury Department, embracing in its organization and having under its control all mints for the manufacture of coin and all assay offices for the stamping of bars. The chief officer of the Bureau is denominated the Director of the Mint, and is under the general direction of the Secretary of the Treasury. He is to hold his office for five years, unless removed by the President, upon reasons to be communicated by him to the Senate. Dr. Linderman will be appointed to this office, having been connected with the Mint, in responsible positions, for the last twenty years to the entire satisfaction of the Government.

The term Branch Mint is abolished, and the Mints at Philadelphia, San Francisco, Carson and Denver will be known as separate establishments. Those who are now Directors of Mints will hereafter bear the names of Superintendents. The offices of Treasurer of the Mints in Philadelphia, San Francisco and New Orleans are to be vacated, and the Assistant Treasurer at New York will cease to perform the duties of Treasurer at the Assay Office. The duties of Treasurers will devolve upon Superintendents, and Treasurers are to act only as Assistant Treasurers of the United States. The salary of the Assistant Treasurer at New York is not to be diminished by the vacation of his office as Treasurer of the Assay Office. The other Assay Offices are at Charlotte, North Carolina and Boise City, Idaho.

There is no change in the gold coinage, but in the silver coinage there is to be a new trade dollar. The two-cent piece is to be abolished, the minor coins being five, three, and one cent pieces. So much of the Sundry Civil Expenses Act of 1870, as provides that until after the completion and occupation of the Branch Mint building, in San Francisco, it shall be lawful to exchange at any Mint, or Branch Mint of the United States, unrefined or upstamped bullion, whenever, in the opinion of the Secretary of the Treasury, it can be done with advantage to the Government, is repealed.

COIN AND BULLION.—The receipts of coin and bullion at San Francisco for the quarter ending March 31st, through Wells, Fargo & Co's Express, were as follows:

	Silver Bullion.	Gold Bullion.	Coin.
January.....	\$295,261	\$892,477	\$917,137
February.....	323,375	535,325	621,152
March.....	332,677	653,915	865,979
Totals.....	\$951,313	\$2,081,717	\$2,404,328

Making a total of \$5,437,358. The sources whence this treasure was received are indicated as follows:

From northern and southern mines.....	\$4,041,663
From northern coast route.....	475,809
From southern coast route.....	190,158
From Mexico.....	729,728
Total.....	\$5,437,358

These figures show an apparent decreased production, as last year the receipts for the same time were \$9,053,202 and in 1871 were \$10,081,974.

ASBESTOS.—There are very extensive deposits of this important mineral within the limits of the United States, that found on the eastern slope of the Green Mountains and of the Adirondacks being of the best quality for fineness and tensile strength. The fiber of New York and Vermont asbestos varies in length from two to forty inches and resembles unbleached flax, when found near the surface, but when taken at a greater depth, it is pure white, and very strong and flexible. It is found also, in considerable quantities in the Tyrol, in Hungary, Corsica and Wales.

The Eureka Mill, Carson river, is running steadily and up to its full capacity. It is the largest mill in the country, and it takes a vast amount of ore to keep it running. As yet the cars on the narrow-gauge road that connects the mill with the Virginia and Truckee railroad are drawn by horses, but a small locomotive will probably be put on this summer.—*Enterprise*.

Leather Market Report.

[Reported for the Press by Dolliver & Bro.]

SAN FRANCISCO, Wednesday, April 2, 1873. The price of sole leather continues the same. French Calf Skins still have an upward tendency, with prospects of a further advance. Owing to the low price of currency East, tanners cannot ship. Leather is therefore low; but there have been some heavy shipments made to Japan, which in a measure help to compensate this.

City Tanned Leather, # D.....	25 00	25 00
Santa Oraz Leather, # D.....	25 00	25 00
Country Leather, # D.....	25 00	25 00
Stockton Leather, # D.....	25 00	25 00
Jodot, 8 Kil, per doz.....	85 00	85 00
Jodot, 11 to 15 Kil, per doz.....	85 00	85 00
Jodot, second choice, 11 to 15 Kil, # doz.....	85 00	85 00
Lemore, 16 to 18 Kil, # doz.....	85 00	85 00
Lewia, 12 and 13 Kil, per doz.....	85 00	85 00
Cornellian, 12 to 16 Kil.....	85 00	85 00
Cornellian Females, 12 to 13.....	85 00	85 00
Cornellian Females, 14 to 16 Kil.....	85 00	85 00
Ogeran Calf, # doz.....	85 00	85 00
Simon, 18 Kil, # doz.....	85 00	85 00
Simon, 20 Kil, # doz.....	85 00	85 00
Simon, 24 Kil, # doz.....	85 00	85 00
Robert Calf, 7 and 9 Kil.....	85 00	85 00
French Kips, # D.....	85 00	85 00
California Calf, # doz.....	85 00	85 00
Eastern Calf for Backs, # D.....	85 00	85 00
Sheep Roams for Topping, all colors, # doz.....	85 00	85 00
Sheep Roams for Lining, all colors, # doz.....	85 00	85 00
California Kneest Sheep Lining.....	85 00	85 00
Best Jodot Calf Boot Legs, # pair.....	85 00	85 00
French Calf Boot Legs, # pair.....	85 00	85 00
Harace Leather, # D.....	85 00	85 00
Fair Bridle Leather, # doz.....	85 00	85 00
Shedding Iron, # D.....	85 00	85 00
Welt Leather, # doz.....	85 00	85 00
Shedding, # doz.....	85 00	85 00
Half Leather, # foot.....	85 00	85 00
Wax Side Leather, # foot.....	85 00	85 00
Eastern Wax Leather.....	85 00	85 00

San Francisco Metal Market.

PRICES FOR INVOICE.

Shipping prices rule, ten to fifteen per cent. higher than the following quotations.

WEDNESDAY, April 2, 1873.	
IRON.—	
White Pig, # ton.....	\$60 00
Refined Bar, bad assortment, # D.....	— 00
Refined Bar, good assortment, # D.....	— 00
Refined Iron, # 4.....	— 00
Plate, No. 5 to 9.....	— 00
Sheet, No. 10 to 13.....	— 00
Sheet, No. 14 to 20.....	— 00
Sheet, No. 21 to 27.....	— 00
Horse Shoes, per keg.....	9 00
Nail Rod.....	10 00
Norway Iron.....	— 00
Roller Iron.....	— 00
Other Irons for Blacksmiths, Miners, etc.....	6 50
COPPER.—	
Brazier.....	— 35
Copper Tin, # D.....	— 35
O'Brien's Pat.....	— 55
Sheathing, # D.....	— 25
Sheathing, Yellow.....	— 25
Sheathing, Old Yellow.....	— 25
Composition Nails.....	— 25
Composition Bolts.....	— 25
THE PLATES.—	
Plates, Charcoal, IX # box.....	14 50
Plates, I O Charcoal.....	13 50
Roofing Plates.....	13 00
Bacon Tin Slabs, # D.....	— 40
Steel.—English Cast, # D.....	— 20
Drill.....	— 20
Flat Bar.....	— 22
Flour Plates.....	— 16
Russia (for mould boards).....	— 17
Zinc.....	— 10
Zinc Sheet.....	— 9
NAILS.—Assorted sizes.....	— 5 00

PLACER MINES.—The *Silver State* says surface diggings are all the rage around Unionville now. Miners have been prospecting Cottonwood Cañon, and struck "two bits to the pan and the bed-rock pitching." George Simons and Joe Groves have quit four dollars a day in the silver mines and gone to Cottonwood, expecting to make better wages working gold mines on their own hook.

The Virginia and Truckee Railroad has put up the rates of freights on lumber as follows: From Carson to Gold Hill and Virginia, \$7 per 1,000 feet; from Reno to Gold Hill and Virginia, \$10 per 1,000 feet, or \$75, car-load rates.

ON TIME.—The *Register* states that the Idaho stages, which were hauled off for a week or two because of the epizootic, are now making regular time.

THE SMITHSONIAN INSTITUTION has received from the publishers, San Francisco, MINING AND SCIENTIFIC PRESS, VOL. XXIV, a gift for which it returns a grateful acknowledgment. JOSEPH HENRY, Sec'y T. S. I. Smithsonian Institution, W. C., Feb. 4, 1873.

NO LIFE INSURANCE COMPANY has a better record or more enhanced popular reputation than the CORNELL MUTUAL LIFE INSURANCE CO., of B. Roberts, 315 California Street, San Francisco, is general agent for this Coast. Send to him for circulars and information of this reliable, first-class company.

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OUT OF THE FOO AT LAST.—Dr. Ery has discovered the only sure cure for Catarrh and Glands. One bottle gives immediate relief, and a few bottles effects a cure. All we ask is a trial. If your druggist don't have it, send to Dr. A. F. Ery & Co., 9 Post street, S. F. It only costs 50 cts. 14 1/2-3m

Spring Mountain Tunnel Company.—Principal place of business, No. 37 New Merchants' Exchange, Cal. office street, San Francisco, Cal. Location of works, Ely Mining District, Lincoln County, Nevada. Notice is hereby given, that at a meeting of the Board of Directors, held on the 15th day of March, 1873, an assessment of \$25 of twenty cents per share was levied upon the capital stock of the corporation, payable immediately, in United States gold and silver coin, to the Secretary, at the office of the Company, 37 New Merchants' Exchange, California street, San Francisco, Cal. Any stock upon which said assessment shall remain unpaid on the 15th day of April, 1873, will be subject and advertised for sale at public auction, and unless payment is made before, will be sold on the 5th day of May, 1873, at the delinquent assessment, together with costs of advertising and expenses of sale. By order of the Directors, J. M. BUEFFINGTON, Secretary. Office, 37 New Merchants' Exchange, California street, San Francisco, California. m15

Mining and Other Companies.

On the 1st day of the month necessary to mail the present large edition of the M. & S. Press, we are obliged to go to press on Thursday evening—which is the very latest hour we can receive advertisements.

Angels Quartz Mining Company—Principal place of business, 408 California street, San Francisco. Location of works: Angels Mining District, Calaveras County, California.

Notice.—There are delinquent upon the following described stock, on account of assessment No. 1, levied March 4th, 1873, the several amounts set opposite the names of the respective shareholders as follows:

The names of the respective shareholders as follows:			
Names.	No. Certificate.	No. Shares.	Amount.
T D Mathewson.....	3	300	\$150 00
T D Mathewson.....	4	314	471 00
T D Mathewson.....	5	600	750 00
T D Mathewson.....	17	26	39 00
T D Mathewson (not issued)		325 5-7	484 57
J H Fish..... (not issued)		342 6-7	574 29
J H Fish, Trustee.....	20	50	75 00
J H Fish, Trustee.....	21	40	75 00
J H Fish, Trustee.....	22	50	75 00
J H Fish, Trustee.....	23	60	75 00
Mrs E B Fish.....	9	1000	1500 00
R M Anthony.....	18	100	150 00
R M Anthony..... (not issued)		45 5-7	68 57
R M Anthony.....	19	60	90 00
E H Sawyer.....	11	800	1200 00
E H Sawyer..... (not issued)		228 4-7	342 86
Geo. Osgood.....	11	400	600 00
Geo. Osgood..... (not issued)		114 2-7	171 43

In accordance with law and an order made by the Board of Directors, on the 4th day of March, 1873, so many shares of each parcel of such stock as may be necessary, will be sold at public auction, at the office of Maurice Dore & Co., 327 Montgomery street, San Francisco, Cal., on Monday, April 21st, 1873, at 2 o'clock P. M., of such day, to pay said delinquent assessment thereon, together with costs of advertising and expenses of sale.

Office, Room No. 1, 408 California Street, San Francisco, California (np stairs). a5-3t

Columbia Smelting and Mining Co.—

Stockholders Meeting. Notice.—The meeting of the stockholders of the Columbia Smelting and Mining Co., for the election of a Board of Trustees for the ensuing year, and for the transaction of such other business as may come before it, will be held at the office of the company, Room 14, No. 428 California street, on the 30th day of April, 1873, at 1 o'clock P. M.

Office, Room No. 1, 428 California Street, San Francisco, California (np stairs). J. W. THOMPSON, Secretary.

Dauphin Mining Company.—Location of

Works, Wyandott District, Butte County, California. Notice.—There are delinquent upon the following described stock, on account of assessment No. 1, levied on the eighth (8th) day of January, 1873, the several amounts set opposite the names of the respective shareholders as follows:

Names.	No. Certificate.	No. Shares.	Amount.
Balcom, C. F., Trustee.....	1	100	\$40 00
Balcom, C. F., Trustee.....	2	100	40 00
Balcom, C. F., Trustee.....	7	100	40 00
Balcom, C. F., Trustee.....	8	100	40 00
Balcom, C. F., Trustee.....	9	100	40 00
Balcom, C. F., Trustee.....	10	100	40 00
Balcom, C. F., Trustee.....	11	50	20 00
Balcom, C. F., Trustee.....	12	100	40 00
Balcom, C. F., Trustee.....	13	100	40 00
Balcom, C. F., Trustee.....	14	100	40 00
Balcom, C. F., Trustee.....	15	50	20 00
Balcom, C. F., Trustee.....	18	25	10 00
Balcom, C. F., Trustee.....	17	25	10 00
Balcom, C. F., Trustee.....	19	25	10 00
Balcom, C. F., Trustee.....	20	100	40 00
Balcom, C. F., Trustee.....	21	100	40 00
Singer, K. C.....	69	100	40 00
Kreider, S. D., Trustee.....	85	500	200 00
Kreider, S. D., Trustee.....	87	400	160 00
Kreider, S. D., Trustee.....	88	1000	400 00
Balcom, C. F., Trustee.....	89	1250	500 00
Balcom, C. F., Trustee.....	90	1250	500 00
Balcom, C. F., Trustee.....	91	1250	500 00
Balcom, C. F., Trustee.....	92	1250	500 00
Balcom, C. F., Trustee.....	93	1250	500 00
Balcom, C. F., Trustee.....	94	1250	500 00
Balcom, C. F., Trustee.....	95	1250	500 00
Balcom, C. F., Trustee.....	96	1250	500 00
Balcom, C. F., Trustee.....	97	1250	500 00
Balcom, C. F., Trustee.....	98	1250	500 00
Balcom, C. F., Trustee.....	99	1250	500 00
Balcom, C. F., Trustee.....	100	1250	500 00

And in accordance with law, and an order of the Board of Directors, made on the eighth day of January, 1873, so many shares of each parcel of such stock as may be necessary, will be sold at public auction, at the salesroom of Maurice Dore & Co., No. 327 Montgomery street, San Francisco, California, on the eighth day of March, 1873, at the hour of 12 o'clock, M., of such day, to pay delinquent assessments thereon, together with costs of advertising and expense of the sale.

CHAS. F. BALCOM, Secretary.
Office, 426 Montgomery street, San Francisco, California. 1522

Eagle Quicksilver Mining Company.—Location of works, Santa Barbara County, California.

Notice is hereby given, that at a meeting of the Board of Directors of said company, held on the 18th day of January, 1873, an assessment of fifty dollars (\$50) per share was levied upon the capital stock of said company, payable immediately in gold coin of the United States, to the Secretary at his office, Room 5, No. 327 Montgomery street, San Francisco, California. Any shares upon which said assessment shall remain unpaid on Wednesday, March 19th, 1873, shall be deemed delinquent, and he who advertised on Saturday, March 22nd, 1873, for sale at public auction, and unless payment shall be made before, will be sold on Monday, the 24th day of March, 1873, to pay the delinquent assessment, together with costs of advertising and expense of the sale.

WM. H. WATSON, Secretary.
Office, Room 5 and 6, No. 327 Montgomery street, San Francisco, Cal. 1525

Frear Stone Company of California.—Location of principal place of business and works, City and County of San Francisco, State of California.

Notice is hereby given, that at a meeting of the Directors, held on the first day of April, 1873, an assessment (No. 5) of two dollars per share was levied upon the capital stock of the corporation, payable immediately in gold coin of the United States, to the Secretary, at the office of the company, No. 414 California street, San Francisco, California. Any stock upon which this assessment shall remain unpaid on the 30th day of May, 1873, will be delinquent, and for sale at public auction, and unless payment is made before, will be sold on Monday, the 26th day of May, 1873, to pay the delinquent assessment, together with costs of advertising and expenses of sale.

R. WEGENER, Secretary.
Office, 414 California street, San Francisco, Cal.

Gold Run Mining Company.—Principal place of business, San Francisco, California. Location of

works, Nevada County, California. Notice is hereby given, that at a meeting of the Board of Directors, held on the 15th day of March, 1873, an assessment of ten cents per share was levied upon the capital stock of the corporation, payable immediately in gold coin of the United States, to the Secretary, at the office of the company, No. 414 California street, San Francisco, California. Any stock upon which this assessment shall remain unpaid on the 30th day of May, 1873, will be delinquent, and for sale at public auction, and unless payment is made before, will be sold on Monday, the 26th day of May, 1873, to pay the delinquent assessment, together with costs of advertising and expenses of sale.

O. C. PALMER, Secretary.
Office, Cor. Market and Spear Streets, San Francisco, California. m22

Hardy Coal Mining Company—Principal

place of business, San Francisco, California. Notice is hereby given, that at a meeting of the Board of Directors, held on the 26th day of March, 1873, an assessment of one dollar per share was levied upon the capital stock of the corporation, payable immediately in United States gold and silver coin, to the Secretary, Room 5, No. 335 Montgomery street, San Francisco, California. Any stock upon which this assessment shall remain unpaid on the first day of May, 1873, will be delinquent, and advertised for sale at public auction, and unless payment is made before, will be sold on Saturday, the 24th day of May, 1873, to pay the delinquent assessment, together with costs of advertising and expenses of sale.

J. A. O. HARDY, Secretary pro tem.
Office, Room 5, No. 335 Montgomery street, San Francisco, Cal. 1m23-4t.

Keystone No. One and Two Gold and Silver Mining Company.

Principal place of business, San Francisco, California. Location of works, Wailapa Mining District, Mohave County, Territory of Arizona. Notice is hereby given, that at a meeting of the Board of Directors, held on the 10th day of March, 1873, an assessment of twenty-five (25) cents per share was levied upon the capital stock of the corporation, payable immediately in gold coin of the United States, to the Secretary, at the office of the company, No. 507 Montgomery street, San Francisco, Cal. Any stock upon which this assessment shall remain unpaid on the 15th day of April, 1873, will be delinquent, and for sale at public auction, and unless payment is made before, will be sold on the 15th (5th) day of May, 1873, to pay the delinquent assessment, together with costs of advertising and expenses of sale. By order of the Board of Directors.

T. E. JEWELL, Secretary.
Office, No. 507 Montgomery street, San Francisco, Cal.

Lady Franklin Gold and Silver Mining

Company.—Location of works, Silver Mountain Mining District, Alpine County, State of California. Principal place of business, San Francisco, Cal.

Notice.—There are delinquent upon the following described stock, on account of assessment No. 1, levied on the eighth day of February, 1873, the several amounts set opposite the names of the respective shareholders as follows:

Names.	No. Certificate.	No. Shares.	Amount.
Andrew Willett.....	42	5	\$2 50
Andrew Willett.....	43	4	2 00
B. L. Osterson.....	72	5	2 50
Thomas Peters.....	100	5	2 50
Thomas Peters.....	103	5	2 50
John Champion.....	116	20	10 00
Ferdinand Bach.....	141	10	5 00
Anna Wright.....	194	5	2 50
W. H. Sawyer.....	246	10	5 00
James Wilson.....	250	5	2 50
James Wilson.....	259	5	2 50

And in accordance with law and an order of the Board of Directors, made on the 18th day of February, 1873, so many shares of each parcel of said stock as may be necessary, will be sold at public auction, at the office of the Secretary, 507 Montgomery street, San Francisco, California, on the 21st day of April, 1873, at the hour of 1 o'clock P. M., of said day, to pay said delinquent assessment thereon, together with costs of advertising and expenses of sale.

J. S. LUTY, Secretary.
Office, 507 Montgomery street, San Francisco, Cal. a5-3t

Lemon Mill and Mining Company.—Principal

place of business, City and County of San Francisco, State of California. Location of works, Eureka Mining District, Lander County, State of Nevada.

Notice.—There are delinquent upon the following described stock, on account of assessment No. 1, levied on the 15th day of February, 1873, the several amounts set opposite the names of the respective shareholders, as follows:

Names.	No. Certificate.	No. Shares.	Amount.
E. Van Santen, Trustee.....	2	100	\$100 00
E. Van Santen, Trustee.....	4	100	100 00
E. Van Santen, Trustee.....	5	100	100 00
E. Van Santen, Trustee.....	6	100	100 00
E. Van Santen, Trustee.....	7	100	100 00
E. Van Santen, Trustee.....	8	100	100 00
E. Van Santen, Trustee.....	9	100	100 00
E. Van Santen, Trustee.....	10	100	100 00
E. Van Santen, Trustee.....	11	100	100 00
E. Van Santen, Trustee.....	12	100	100 00
E. Van Santen, Trustee.....	13	100	100 00
E. Van Santen, Trustee.....	14	100	100 00
E. Van Santen, Trustee.....	15	100	100 00
E. Van Santen, Trustee.....	16	100	100 00
E. Van Santen, Trustee.....	17	100	100 00
E. Van Santen, Trustee.....	18	100	100 00
E. Van Santen, Trustee.....	19	100	100 00
E. Van Santen, Trustee.....	20	100	100 00
E. Van Santen, Trustee.....	21	100	100 00
E. Van Santen, Trustee.....	22	100	100 00
E. Van Santen, Trustee.....	23	100	100 00
E. Van Santen, Trustee.....	24	100	100 00
E. Van Santen, Trustee.....	25	100	100 00
E. Van Santen, Trustee.....	26	100	100 00
E. Van Santen, Trustee.....	27	100	100 00
E. Van Santen, Trustee.....	28	100	100 00
E. Van Santen, Trustee.....	29	100	100 00
E. Van Santen, Trustee.....	30	100	100 00
E. Van Santen, Trustee.....	31	100	100 00
E. Van Santen, Trustee.....	32	100	100 00
E. Van Santen, Trustee.....	33	100	100 00
E. Van Santen, Trustee.....	34	100	100 00
E. Van Santen, Trustee.....	35	100	100 00
E. Van Santen, Trustee.....	36	100	100 00
E. Van Santen, Trustee.....	37	100	100 00
E. Van Santen, Trustee.....	38	100	100 00
E. Van Santen, Trustee.....	39	100	100 00
E. Van Santen, Trustee.....	40	100	100 00
E. Van Santen, Trustee.....	41	100	100 00
E. Van Santen, Trustee.....	42	100	100 00
E. Van Santen, Trustee.....	43	100	100 00
E. Van Santen, Trustee.....	44	100	100 00
E. Van Santen, Trustee.....	45	100	100 00
E. Van Santen, Trustee.....	46	100	100 00
E. Van Santen, Trustee.....	47	100	100 00
E. Van Santen, Trustee.....	48	100	100 00
E. Van Santen, Trustee.....	49	100	100 00
E. Van Santen, Trustee.....	50	100	100 00
E. Van Santen, Trustee.....	51	100	100 00
E. Van Santen, Trustee.....	52	100	100 00
E. Van Santen, Trustee.....	53	100	100 00
E. Van Santen, Trustee.....	54	100	100 00
E. Van Santen, Trustee.....	55	100	100 00
E. Van Santen, Trustee.....	56	100	100 00
E. Van Santen, Trustee.....	57	100	100 00
E. Van Santen, Trustee.....	58	100	100 00
E. Van Santen, Trustee.....	59	100	100 00
E. Van Santen, Trustee.....	60	100	100 00
E. Van Santen, Trustee.....	61	100	100 00
E. Van Santen, Trustee.....	62	100	100 00
E. Van Santen, Trustee.....	63	100	100 00
E. Van Santen, Trustee.....	64	100	100 00
E. Van Santen, Trustee.....	65	100	100 00
E. Van Santen, Trustee.....	66	100	100 00
E. Van Santen, Trustee.....	67	100	100 00
E. Van Santen, Trustee.....	68	100	100 00
E. Van Santen, Trustee.....	69	100	100 00
E. Van Santen, Trustee.....	70	100	100 00
E. Van Santen, Trustee.....	71	100	100 00
E. Van Santen, Trustee.....	72	100	100 00
E. Van Santen, Trustee.....	73	100	100 00
E. Van Santen, Trustee.....	74	100	100 00
E. Van Santen, Trustee.....	75	100	100 00
E. Van Santen, Trustee.....	76	100	100 00
E. Van Santen, Trustee.....	77	100	100 00
E. Van Santen, Trustee.....	78	100	100 00
E. Van Santen, Trustee.....	79	100	100 00
E. Van Santen, Trustee.....	80	100	100 00
E. Van Santen, Trustee.....	81	100	100 00
E. Van Santen, Trustee.....	82	100	100 00
E. Van Santen, Trustee.....	83	100	100 00
E. Van Santen, Trustee.....	84	100	100 00
E. Van Santen, Trustee.....	85	100	100 00
E. Van Santen, Trustee.....	86	100	100 00
E. Van Santen, Trustee.....	87	100	100 00
E. Van Santen, Trustee.....	88	100	100 00
E. Van Santen, Trustee.....	89	100	100 00
E. Van Santen, Trustee.....	90	100	100 00
E. Van Santen, Trustee.....	91	100	100 00
E. Van Santen, Trustee.....	92	100	100 00
E. Van Santen, Trustee.....	93	100	100 00
E. Van Santen, Trustee.....	94	100	100 00
E. Van Santen, Trustee.....	95	100	100 00
E. Van Santen, Trustee.....	96	100	100 00
E. Van Santen, Trustee.....	97	100	100 00
E. Van Santen, Trustee.....	98	100	100 00
E. Van Santen, Trustee.....	99	100	100 00
E. Van Santen, Trustee.....	100	100	100 00

And in accordance with law, and an order of the Board of Directors, made on the 15th day of February, 1873, so many shares of each parcel of said stock as may be necessary, will be sold at public auction, at the salesroom of Maurice Dore & Co., No. 327 Montgomery street, San Francisco, California, on the 15th day of April, 1873, at the hour of 1 o'clock P. M., of said day, to pay said delinquent assessment thereon, together with costs of advertising and expenses of sale.

WM. H. WATSON, Secretary.
Office, Room 5 and 6, No. 327 Montgomery street, San Francisco, Cal. 1525

Frear Stone Company of California.—Location of principal place of business and works, City and County of San Francisco, State of California.

Notice is hereby given, that at a meeting of the Directors, held on the first day of April, 1873, an assessment (No. 5) of two dollars per share was levied upon the capital stock of the corporation, payable immediately in gold coin of the United States, to the Secretary, at the office of the company, No. 414 California street, San Francisco, California. Any stock upon which this assessment shall remain unpaid on the 30th day of May, 1873, will be delinquent, and for sale at public auction, and unless payment is made before, will be sold on Monday, the 26th day of May, 1873, to pay the delinquent assessment, together with costs of advertising and expenses of sale.

R. WEGENER, Secretary.
Office, 414 California street, San Francisco, Cal.

Gold Run Mining Company.—Principal place of business, San Francisco, California. Location of

works, Nevada County, California. Notice is hereby given, that at a meeting of the Board of Directors, held on the 15th day of March, 1873, an assessment of ten cents per share was levied upon the capital stock of the corporation, payable immediately in gold coin of the United States, to the Secretary, at the office of the company, No. 414 California street, San Francisco, California. Any stock upon which this assessment shall remain unpaid on the 30th day of May, 1873, will be delinquent, and for sale at public auction, and unless payment is made before, will be sold on Monday, the 26th day of May, 1873, to pay the delinquent assessment, together with costs of advertising and expenses of sale.

O. C. PALMER, Secretary.
Office, Cor. Market and Spear Streets, San Francisco, California. m22

Lady Esten Tunnel and Mining Company.

Location of principal place of business, No. 35 New Merchants' Exchange, California Street, San Francisco, California. Location of works, Little Cottonwood District, Utah Territory. Notice is hereby given, that at a meeting of the Directors, held on the 17th day of March, 1873, an assessment (No. 1) of five cents per share was levied upon the capital stock of the corporation, payable immediately in United States gold coin, to the Secretary, at the office of the company, No. 35 New Merchants' Exchange, California Street, San Francisco, California. Any stock upon which this assessment shall remain unpaid on the 17th day of April, 1873, will be delinquent, and advertised for sale at public auction, and unless payment is made before, will be sold on Tuesday, the sixth day of May, 1873, to pay the delinquent assessment, together with costs of advertising and expenses of sale.

CHAS. S. HEALY, Secretary.
Office, No. 35 New Merchants' Exchange, California Street, San Francisco, California. m22

Mansfield Gold Mining Company.—Location

of principal place of business, San Francisco. Notice.—There are delinquent upon the following described stock, on account of assessment No. 1, levied on the 15th day of February, 1873, the several amounts set opposite the names of the respective shareholders as follows:

Names.	No. Certificate.	No. Shares.	Am't
Busher, J. L.....	not issued.	375	\$ 9 38
Dennie, J. O.....	not issued.	650	16 25
Higgins, W. E.....	not issued.	3200	52 50
Richards, W. K.....	not issued.	450	11 33
Tackery, Mrs E A.....	not issued.	2250	56 25

And in accordance with law, and an order of the Board of Directors, made on the 17th day of February, 1873, so many shares of each parcel of said stock as may be necessary, will be sold at public auction, at the office of the Company, No. 331 Kearny Street, San Francisco, California, on the fourteenth day of April, 1873, at the hour of one o'clock p. m., of said day, to pay said delinquent assessment thereon, together with costs of advertising and expense of sale.

Machine Builders.

ESTABLISHED 1851.

PACIFIC IRON WORKS,

First and Fremont streets,

SAN FRANCISCO

IRA P. RANKIN, A. P. BRAYTON,
GEO. W. FOGG, Superintendent.

Steam Engines and Boilers,

MARINE AND STATIONARY,

IRON AND BRASS CASTINGS

Mining Machinery of Every Description,

And all other classes of work generally done at first-class establishments, manufactured by us at the lowest prices, and of the best quality.

Particular attention paid to Jobbing Work and Repairs.

N. E. Sole Agents for sale of HUNTOON'S CELEBRATED PATENT GOVERNOR.

15v20-3m GODDARD & CO.

FULTON

Foundry and Iron Works.

HINKLEY & CO.,

MANUFACTURERS OF

TEAM ENGINES,

Quartz, Flour and Saw Mills,

also Improved Steam Pumps, Brodie's Improved Crusher, Mining Pumps, Amalgamators, and all kinds of Machinery.

N. E. corner of Tehama and Fremont streets, above Howard street, San Francisco. 3-47



GEORGE T. PRACY, MACHINE WORKS,

109 and 111 Mission Street,
SAN FRANCISCO.

These Works have lately been increased, by additional tools, and we are now able to turn out any kind of work, equal to and cheaper than any establishment in the State; that is to say:—

STEAM ENGINES,

Flour and Saw Mills,

QUARTZ MACHINERY

Printing Presses,

AND MACHINERY MADE OF EVERY DESCRIPTION.

Improved Safety Store Hoists,

Fitted with Onting's Patent Cams, unequalled for safety, convenience and cheapness. This Hoist can be built for about half the price of any other in use. To be seen at HAWLEY & CO.'S.

ALSO, MANUFACTURER AND SOLE AGENT FOR
Pracy's Celebrated Governor.
TURNING LATHES, Etc., constantly on hand.
4v23tf

UNION IRON WORKS, Sacramento.

ROOT, NEILSON & CO.,

MANUFACTURERS OF

STEAM ENGINES, BOILERS,

CROSS' PATENT BOILER FEEDER AND SEDIMENT COLLECTOR

Dunbar's Patent Self-Adjusting Steam Piston
PACKING, for new and old Cylinders.

And all kinds of Mining Machinery.

Front Street, between N and O streets,
SACRAMENTO CITY.

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Rolling Mill Company,

SAN FRANCISCO, CAL.

Established for the Manufacture of
RAILROAD AND OTHER IRON
—AND—
Every Variety of Shafting,Embracing ALL SIZES of
Steamboat Shafts, Cranks, Piston and Connecting Rods, Car and Locomotive Axles and Frames

HAMMERED IRON

Of every description and size.

Orders addressed to PACIFIC ROLLING MILL COMPANY P. O. box 2032, San Francisco, Cal., will receive prompt attention.

The highest price paid for Scrap Iron. 9v143

THE RISDON

Iron and Locomotive Works.

INCORPORATED.....APRIL 30, 1868.
CAPITAL.....\$1,000,000.LOCATION OF WORKS:
Corner of Beale and Howard Streets,
SAN FRANCISCO.

Manufacturers of Steam Engines, Quartz and Flour Mill Machinery, Steam Boilers (Marine, Locomotive and Stationary), Marine Engines (High and Low Pressure). All kinds of light and heavy Castings at lowest prices. Cams and Tappets, with chilled faces, guaranteed 40 per cent. more durable than ordinary iron.

Directors:
Joseph Moore, O. J. Brennan, O. E. McLane,
Wm. Norris, Wm. H. Taylor, Lloyd Tevis,
James D. Walker.WM. H. TAYLOR.....President
JOSEPH MOORE.....Vice-President and Superintendent
LEWIS R. MEAD.....Secretary
24v10-5

GEO. W. PRESCOTT. O. W. SCHEIDEL. W. R. BOKART

PRESCOTT, SCHEIDEL & CO.,

MARYSVILLE FOUNDRY.

Corner of B and Fourth streets, Marysville, Cal.

MANUFACTURERS OF

STEAM ENGINES,

STATIONARY AND PORTABLE

SAW AND GRIST MILLS,

Hydraulic Machinery,

Quartz Crushing and Amalgamating Machinery

Of every description, constantly on hand.

Plans and estimates furnished upon application. Repairs upon all kinds of Machinery promptly made, and at moderate charges.

Having unrivaled facilities, we are prepared to make to order, at short notice, anything required in our line. Specimens of our work may be seen in all the mining regions on this coast.

OCCIDENTAL FOUNDRY,

137 and 139 First st., near the Gas Works, San Francisco.

STEIGER & BOLAND,

IRON FOUNDERS.

IRON CASTINGS of all descriptions at short notice. All orders punctually executed in time agreed on. Particular attention paid to making superior Shoes and Dies. Among the special castings of this Foundry are the well known CALLAHAN GRATE BAR, of superior merit for burning screenings—all size Bars. STRATTON'S JACK SCREWS, all sizes. Superior, compact and effective Horse Powers, Pumps, Agricultural Castings, Lugot Moulds, Assaying and Refining Retorts and Kettles, and a great variety of other and special castings.

STEIGER & BOLAND PROPRIETORS.

Steiger & Boland are the sole Manufacturers of the Improved Hepburn Roller Pan. The patterns having all the improvements to those Pans, are at the Occidental Foundry, enabling the Establishment to deliver all pans and parts thereof with uniformity, finished in the best style, and at the lowest possible price. Pan Castings furnished the trade, with liberal facilities for erection, &c. All persons are cautioned against making, selling or using these Pans, except through the authorized agents and manufacturers, viz., Steiger & Boland, of the Occidental Foundry, S. F.

22v25-3m

WM. H. HEPBURN.

A. HANKE'S

IRON FOUNDRY,

CORNER MAIN AND HARRISON STREETS,

Entrance on Main Street.....San Francisco.

Every Description of Ornamental Work, Stove and French Range Work, grate and fender work, small machines of all descriptions, house work, etc., promptly attended to.
25v25-3m

CALIFORNIA BRASS FOUNDRY,

No. 125 First street, opposite Minna,
SAN FRANCISCO.ALL KINDS of Brass, Composition, Zinc, and Babbitt Metal Castings, Brass Ship Work of all kinds, Spikes, Sheathing Nails, Radder Braces, Hinges, Ship and Steamboat Belts and Gongs of superior tone. All kinds of Cocks and Valves, Hydraulic Pipes and Nozzles, and Hose Couplings and Connections of all sizes and patterns, furnished with dispatch.
PRICES MODERATE.
J. H. WEED. V. KINGWELL.

THOMPSON BROTHERS,

EUREKA FOUNDRY,

129 and 131 Beale street, between Mission and Howard,
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LIGHT AND HEAVY CASTINGS,

of every description, manufactured. 24v16qr

Miners' Foundry and Machine Works,

CO-OPERATIVE,

First Street, bet. Howard and Folsom, SAN FRANCISCO

Machinery and Castings of all kinds.

NATIONAL LOCOMOTIVE WORKS.

N. Seibert's Eureka Lubricators.

DAWSON & BAILY,

Connellsville, Penn.,

Manufacture LOCOMOTIVES adapted to Every Kind of Railway Service.

NARROW GAUGE AND MINE LOCOMOTIVES A SPECIALTY.

All work accurately fitted to gauges, and thoroughly interchangeable.

H. A. GORLEY, Agent,

At T. G. Cockrill & Co.'s, No. 521 Front Street, S. F.

Photographs of Locomotives can be seen at the above Number. 12v26tf

Machinery.

IMPORTANT TO

Quartz Mining Companies.

IMPROVED PATENTED

Hardened Cast Steel Shoes & Dies.

The undersigned are prepared, at short notice, to furnish IMPROVED PATENTED HARDENED CAST STEEL SHOES AND DIES, for Quartz Mills of every pattern. This improvement supplies a want long needed by persons engaged in Mining enterprises. They are more economical and cheaper than cast iron shoes, as they wear from four to six times as long, and crush a greater quantity, as they retain their full diameter, never chipping from the edges. This, with the time saved in replacing worn and broken iron shoes and Dies, and the great saving of freight to remote mills and mines, makes a vast difference in the cost of reduction of ores.

WE ALSO FURNISH

Cast Steel Tappets, Cams, Picks and Hammers,

Which possess the same advantage of Economy and Durability, and deserve the special attention of Miners and others engaged in quartz crushing.

The Superior Strength of these steel castings—the fact that they can be forged and welded as easily as bar steel—their cheapness and great accuracy, as compared with forged iron—cannot fail to make them desirable for many purposes, where forged iron and steel have heretofore been used. Among such articles we mention:

ROLLING MILL CASTINGS.

Bevel and Spur Wheels, Guides, Spindles, Dies, etc. AGRICULTURAL CASTINGS. Reaper Guards, Plow Shares, Mold Boards, Plow Jointers, etc.

Anvils, Sledges, Vices, Masons' Hammers, Blacksmith Hammers, Mattocks, R. R. Frogs, etc. And other articles requiring solidity and great strength.

DONKEY ENGINES FOR HOISTING,

Mining Machinery, Etc.

Persons giving orders will send diagrams and measurements of Shoes and Dies, etc., as above.

J. G. KITTREDGE & CO.,

No. 515 California street, San Francisco.
12v23-1f

Scaling and Foaming Prevented and Fuel Saved.

Enquirers are respectfully informed that

WARSON'S AERO STEAM SYSTEM

Has been well tested, during three years, in England. Besides the above advantages, it greatly prolongs the life of Boilers, Tubes and Fire-boxes.

It is a cheap contrivance, and easily applied to any engine.

Illustrated Circulars, showing the appliance and describing its advantages, are sent to all applicants.

All who are troubled with Scale and Foaming may rely on this system of prevention—also on saving at least 20 per cent. of fuel.

RICHARDS for States and for individuals will be sold on liberal terms.

J. L. SANFORD,

General Agent for United States,

420 Montgomery street, San Francisco,
And Box 369, P. O.

Information Required to Give an Estimate of Warson's Apparatus:

- 1.—Diameter of Cylinder.
- 2.—Length of Stroke.
- 3.—Number and Length of Boilers—Tubes or Flues.
- 4.—Distance of Boilers from Engine.
- 5.—Can Pump Piston be attached to Cross-head of Engine?

It can, however, be driven by any of the usual appliances that work the Water-feed Pump.

These items will enable me to give a near estimate of the cost.

J. L. SANFORD, General Agent.

Notice is hereby given, that the copartnership heretofore existing between A. J. Severance, Charles W. Randall and J. Gus. Burt, under the firm name of "Severance, Holt & Co.," is this day dissolved by mutual consent. A. J. Severance, having purchased all the interest of his late partners, will continue the business of manufacturing and selling Diamond Drills as before, under the style of A. J. Severance & Co.

Dated San Francisco, Nov. 24, 1871.
Office, 315 California street. A. J. SEVERANCE,
CHAS. W. RANDALL,
J. GUS. BURT.

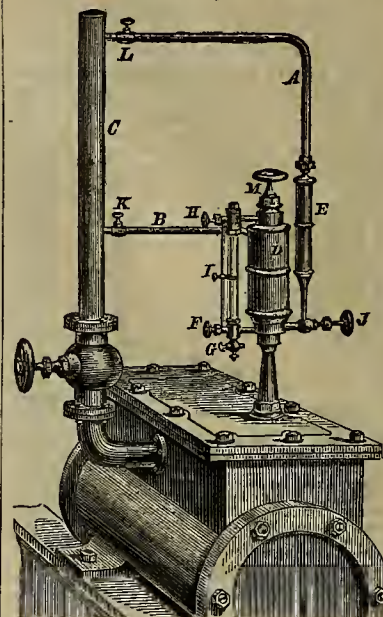
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THEODORE KALLENBERG,

MACHINIST,

and Maker of Models for Inventors. All kinds of Dies Stamps and Punches made. Also, all kinds of Small Gear Cut.

Repairing done on very Reasonable Terms and in the best manner. No. 32 Fremont street, S. F. 19v22-3m



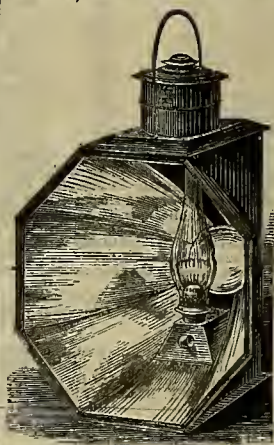
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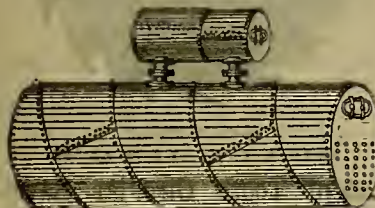
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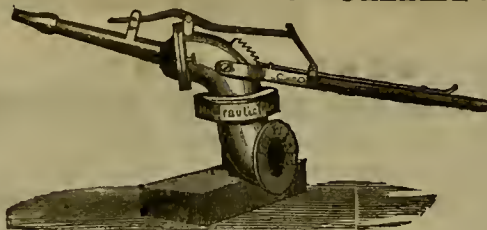
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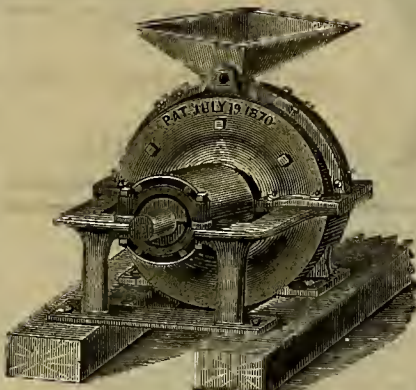
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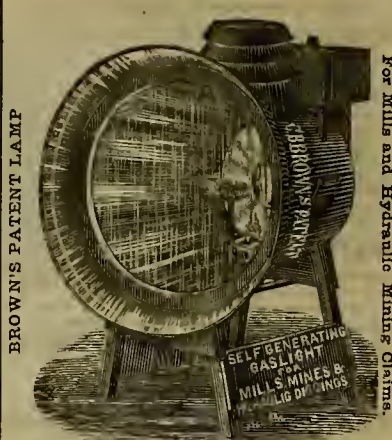
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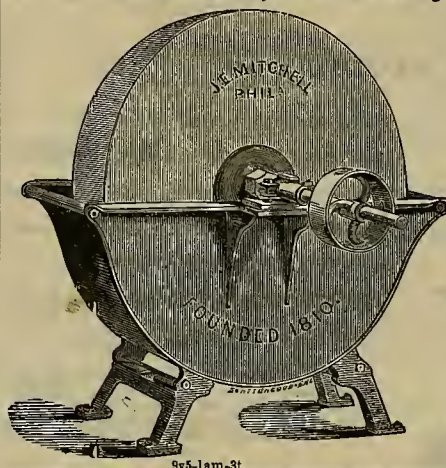
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Superintendent's Office, Sept. 28, 1872.
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The Vallejo Tunnel Company's Tramway in Little Cottonwood, built on the HALLIDIE PATENTED PLAN, is a complete success. It is between 2,300 and 2,400 feet in length, and is supported by thirteen stations. The fall to this distance is about 600 feet, and the wire rope, which is three-fourths of an inch in diameter, will easily and easily deliver one hundred tons in six hours. The machinery is automatic, loading and unloading the sacks or buckets. About one ton and a half can be sent down at one time. The stations are about two hundred feet apart, and the entire apparatus is strong and safe. As the wire rope is elevated about forty feet above the surface of the hill, the Tramway can be worked all winter long, without the slightest trouble.—Utah Mining Journal, Salt Lake, Sept. 22, 1872.
Mining Companies and others desiring to negotiate for the erection of this system of Ropeway, can communicate with me personally, or through Postoffice Box 904.

A. S. HALLIDIE, Patentee,
112 and 114 California Street, SAN FRANCISCO.

WIRE ROPE
For hoisting from mines, transmitting power, ship rigging, etc., of all kinds and sizes, on hand and made to order.
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Fisk's Self-Acting Wagon Brake.

We should consider an invention praiseworthy at least which has for its object the simple amelioration of the labors which we impose upon our beasts of burden and of draught, but when that invention also possesses advantages of importance and utility outside of a mere saving of animal strength it then acquires an additional value, which should recommend it to public favor. In all hilly and mountainous countries the most exhausting task of beasts of draught is to hold back upon the wagon while descending hills; this is especially fatiguing and laborious for the reason that our common road vehicles are not constructed with a view to down hill work, but are made to accommodate a direct pull. Farm wagons in the mountainous portions of the country do not last as long as those employed on level roads, for the reason that a loaded wagon is subjected to such severe strains by the unsteady hold back of the team, when no competent brake is used. The ordinary hand brake serves to hold the wagon when properly applied, but it is quite inconvenient and it requires a very nice adjustment in order to properly gauge the breaking force to the load in the wagon and steepness of the declivity.

Mr. Oliver Fisk, of Centerville, Mariposa county, in this State, has invented and secured letters patent, through the SCIENTIFIC PRESS Patent Agency, both in the United States and Canada, for a self-acting wagon brake, an illustration of which is herewith given. By his arrangement the combined action of the gravity of the loaded wagon and the first hold back of the horses upon commencing the descent of a declivity applies the brake automatically, according to the requirements in each case, and looks the brake in position against the wheels, so that they will apply the necessary friction during the entire descent without requiring any further holding back from the team. When the wagon reaches the bottom of the hill the first pull of the team upon the double-trees frees the brakes and the wagon again moves freely.

This is accomplished by means of a pawl and ratchet, situated just behind the double-trees. The pawl is so connected that when the wagon begins to move forward by the impulse of gravity, the pawl will be pressed back, and through the levers, c and d, and their connecting arms, the brake bars are forced against the wheels. The pawl falls into the teeth of the rack and thus holds the brakes against the wheels until the bottom of the hill is reached, or until the first pull of the horses takes place. By means of a bell crank lever this pull upon the double-trees throws the pawl up out of the rack, and the action upon the levers and brake-bars is such as to again move the brakes away from the wheels.

For further information address Mr. Oliver Fisk, Centerville, Mariposa, county, Cal.

LARGE FISH BREEDING ENTERPRISE.—Claus Spreckle proposes to drain the chain of lakelets and ponds on his ranch, to the west of the Watsonville road, Santa Cruz county, and excavate all the mud and sediment, and then run a feeder or ditch to the small stream heading up near Buzzard Lagoon, so as to form artificial fish-ponds, for the raising of choice fish for table use. The ponds, when ready, will be stocked with eastern trout, black bass, pike and pickerel.

Mining vs. Speculation.

In one of our late issues, allusion was made to the manner in which some few of our prominent mining speculators manipulated the stock market, so as to put up or down the price of shares at will, totally irrespective of the value of the particular property in question, and how every such fluctuation in price involved pecuniary loss to all outside speculators.

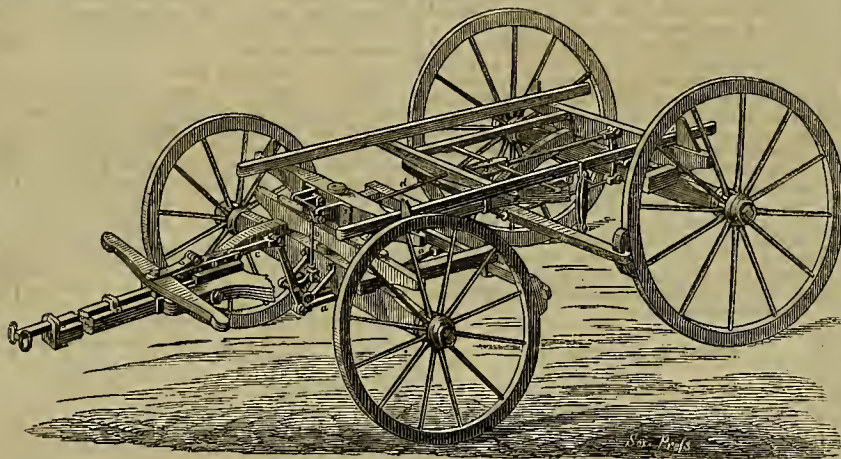
During the past fortnight a few of the old crowd of operators have been strenuously endeavoring, by resorting to their usual trick, to inflate the price of certain Comstock mines. "Reliable information" regarding imaginary strikes, was being telegraphed by superintendents and others about the mines to their friends(?) in this city; the contrivances

ing as in every other business, or else such moles as the Emma, Richmond, or Geddes and Bertraud, would prove no more remunerative to their owners than the Overman or Hale & Norcross; which latter, by the bye, although supposed to be one of the best managed mines on the Comstock, has not returned to the stockholders more than one quarter of the gross yield in dividends—only three-fourths of the total yield for expenses.

However, it is highly probable that, on the decline of stock gambling, legitimate mining will resume the way; and when this happy consummation shall have been attained, the yield of precious metals from the Pacific States, will be such as to astonish the world.

Academy of Sciences.

The regular meeting of the Academy of Sciences was held on Monday evening, and Samuel O. Gray, H. H. Haight and Samuel F. Reynolds



FISK'S SELF-ACTING WAGON BRAKE.

of a few of those seedy looking individuals who hang around the corners, and are known as curbstone brokers, brightened up at the prospect of the little commissions that would fall to their share for helping, in their small way, some of the big fish in their dirty work. But these stale old games have been played once too often, and the mining sharps find to their great disgust, that no one who has any money to lose puts the slightest confidence in their plausible stories, and that no one with any character to lose will countenance any of their swindles.

This is just as it should be. The business men of this city who have always been ready and willing to advance money for any legitimate mining enterprise, appear to have formed a pretty correct estimate of the character of the men composing the mining rings of California street, and now carefully shun them and the mines they control. Let the Hale & Norcross, Savage and Virginia Consolidated crowd work their claims at a profit or a loss; let them declare dividends or levy assessments just as it suits them; let the Jones-Hayward and bank parties do the same with their mines, for the future it will make but little difference to the community at large, who are no longer willing to be duped.

Capitalists who feel disposed to invest some of their surplus in mines will know that there is an inexhaustible field for the investment of their money in the many well known rich quartz veins of California, and in the silver lodes of Central Nevada, Utah and Arizona. In such districts as Tintic, Belmont, Columbus, Hualapai and others, there are many mines now unworked, which, if managed with prudence and economy, as some of the English companies on this coast are, would prove most remunerative to the owners. But wanton extravagance must be avoided in min-

were duly elected members. Among the donations to the cabinets were they following:

Crustaceans, presented by Professor Davidson; were caught at night near Cape St. Lucas; water was perfectly white from phosphorescence. Two of them will light up a bucketful of water.

Dr. Gibbons presented on the part of Dr. Cleveland, a portion of a deer's head, showing an arrested development of the antlers in consequence of injury to the testes.

Skull of lagenorhynchus albirostratus, caught by Capt. Martin, on a voyage from Tahiti to San Francisco. Presented by proprietors of the *Alta*.

Barnacles from green turtle, Mazatlan; small ones from Cape St. Lucas; larger ones from stomach of a bonita (fish), caught off Lower California.

Large snake from San José de Cabo. Presented by Professor Davidson.

Large specimens of scorpions, lizards, etc., from Mr. Gillespie, United States Consular Agent at San José de Cabo.

Nine large and handsomely illustrated volumes of Kingsborough's Mexican Antiquities and Dupaix' Monuments were presented by a new member, Mr. Geo. C. Hickox; total cost of the set \$1,500.

Death of Prof. Torrey.

Mr. Dall read a paper on the life and services of John Torrey, Professor of Botany and Chemistry, who died on the 10th of March, aged 77 years. Dr. Gibbons followed in a brief address, in which he alluded to the two visits made by Prof. Torrey to the Pacific Coast.

Miscellaneous.

Prof. Davidson read a paper containing the result of his inquiries as to the exact geographical position of the observations taken of the transit of Venus at San José del Cabo, in Southern California, in 1868 to which full reference is made in another column.

F. Gutzkow described a new process for the

extraction of boracic acid, which will be found in another column. A letter was read, written by Harry Edwards, stating that Lewis Frazer, an old man who has performed great service in the fields of science, is now destitute and suffering in British Columbia, and suggesting that a contribution be taken in aid of his family.

After the adjournment a number of members added their names to that of Mr. Edwards on the paper. Mr. Fraser is one of the survivors of the Nile expedition, and is the author of several scientific works.

The Transit of Venus in 1769.

In the year 1769, the French Government sent an astronomical party, under charge of M. Chappe, to a point known as San José del Cabo, in the southern extremity of Lower California, to observe the transit of Venus which occurred that year. The observations of this party are considered of great value, but unfortunately the geographical position of the station was not well determined, on account of the sudden death of the principal of the expedition, which occurred soon after the transit and before any proper detailed plan of the locality had been made. Efforts have since been made to discover the precise location but without avail, until quite recently, when that part of the Coast was visited by Professor Davidson of the Coast Survey, under the especial authority of the Superintendent of the Coast Survey.

While there, Professor D., succeeded in finding the spot, and in determining its latitude and longitude.

The foundations upon which the instruments were placed had been covered up many years ago; but Professor D. thinks he has located them within an area of 20 feet square, or a possible error of 10 feet of latitude and longitude—a pretty close approximation, truly.

The latitude was carefully determined by the usual observations, made by Mr. Eimbeck, and also the longitude by means of twenty-four chronometers taken from San Diego and back—the longitude of San Diego being well determined by telegraphic connection with Greenwich, via San Francisco and Cambridge. These results will make available the excellent observations made by M. Chappe of the transit of Venus of 1769, although 104 years have elapsed since they were made.

These facts have a special interest in view of the coming transits of Venus, in 1874 and 1882, to observe which, astronomers all over the world are making preparations of unusual completeness.

The chief importance connected with the transits of Venus is the determination of the sun's parallax—or in other terms the distance of the earth from the sun. From the observations of the transit in 1769, there was at first discovered a parallax of 8.576 seconds of arc—corresponding to a distance of 95,311,000 miles. Subsequent discussions of these observations have increased the parallax to about 8.9 seconds—corresponding to a distance of about 91,800,000 miles; a very important margin of possible error. It is hoped that the transit of 1874 will enable astronomers to arrive at more definite and reliable data.

We have condensed the above from a paper read by Prof. Davidson before the Academy of Sciences, at their meeting on Monday evening last.

PATENT OFFICE RECEIPTS FOR MARCH.—The total amount of cash received by the Patent Office, for patents and otherwise, during March, was \$69,790. The amount exceeds that of any one month since the creation of the Office,

CORRESPONDENCE.

Nevada County—Letter From "Old Block."

(Written for the MINING AND SCIENTIFIC PRESS.)

Our town still lives. Amid the revulsion of the mining stock market we move calmly along, untouched by the blighting storm of stock gouging, depending upon the merits of our mine and not upon assessments to keep our mines in operation. There is not a single developed quartz mine in the township but what is paying more than expenses, and some of them are paying very large dividends.

The Idaho, for instance, yields monthly about \$60,000; the Eureka from \$40,000 to \$50,000; the Empire and North Star from \$10,000 to \$15,000, and \$20,000, while some of the smaller and undeveloped mines are paying equally as well in proportion to the capital invested and the size of the machinery used.

The Green Mountain, one of the Osborne Hill mines, with only five stamps, and a small vein, has taken out in eighteen days over \$6,000. The Dairy Hill in a crushing of about ten days yielded over \$6,000. The State ledge (Pinsou & Brown), is yielding like the others. The Dartmouth, under the supervision of Capt. John Miller, is beginning to reward his perseverance, paying something over expenses. This last is a gravel mine situated at the base of Alta Hill. Capt. Miller was singularly unfortunate in the commencement. He built a fine mill for his company and had just got it completed when some malignant fiend set it on fire, and it was totally consumed. Within sixty days a new mill was built and ready for operation, an evidence of his activity, perseverance and grit, and is now doing fine work on the rich gravel, supposed to have been the bed of an ancient river. There is every indication that he will ere long get his money back with miner's interest.

Grass Valley is decidedly in a prosperous condition. We are shipping about \$250,000 in bullion monthly, and we have a capacity, if it were improved, of taking out over a million per month. I am sincere in the belief that Nevada county is one of the richest gold districts in the world. A residence of twenty years here has given me opportunities of gaining information with regard to the character of the golden belt, and from statistics which I have been trying to gather I am satisfied that the total amount of gold taken from the county since its settlement will not fall short of one hundred and fifty millions of dollars; and we are only upon the threshold of the golden deposit. There are many valuable mines which have been abundantly proved good, that are laying idle, simply for want of capital to reopen and work them with the new and improved appliances of mining. Even Grass Valley, within a radius of about four miles by seven, has added to the circulating medium of the world over forty-five millions of dollars.

We have been a little amused with Professor Carr's lecture, given some time since in Oakland, in which he endeavors to depreciate the mining interests in California. He is evidently not fully posted on the subject when he says that there are 50,000 miners at work in our mines, and that every dollar extracted costs a dollar and a half. I guess he has been bit by investing in a poor or badly-managed mine. Let him take a trip through Nevada County and see what has been done within twenty years; the towns built up; the thousands of good homes made; the taxable property instituted; the thrifty mercantile stores opened and various branches of business; the expensive water ditches bringing water from mountain snows; the public buildings erected and fine farms opened—all from the produce of these very mines which he holds in such low estimation, and be must see the "error of his ways" and "repent before it is too late." While we would uphold the mining interest for exactly what it is—one of the greatest industries of the State—we would not depreciate the other great industry—agriculture. It is indeed great, and deserves encouragement, and we hope to see it prosperous and remunerative; but we will believe that the mining interest is really one of the greatest, and deserving encouragement. More anon. Old Block.

Grass Valley, March 31, 1873.

The Whelpley & Storer Pulverizer.

A correspondent of the *Lessen Advocate* writes to that paper as follows concerning the pulverizer of the Whelpley & Storer pattern which has just been put in operation at Hayden Hill:

A few days since, in company with several ladies and gentlemen of this place we went, at the invitation of J. C. Layton of San Francisco, to see the starting of one of the above mills, which has been put up for the Old Providence Mill and Mining Co. at Hayden Hill, under the supervision of the above named gentleman; said mills being used for the crushing and sampling of ores, pulverizing foundry facings, salt, paints, cements, or any other material, to any degree of fineness.

The building in which it is erected is 20 by 60 feet. In the rear at an elevation of 22 feet the crusher or breaker is fixed. This is an iron cylinder or tub, the sides of which are thick, wrought iron plates, perforated with holes three-fourths of an inch in diameter. The

cover of the cylinder is made of two plates of cast-iron, in one of which is an opening through which the rock passes to be crushed. The bottom of the cylinder is a strong cast iron plate on which are placed several blocks of iron faced with steel, and is attached to an upright shaft which revolves at the rate of 1,400 revolutions per minute. This whole machine is surrounded by a close chamber for the collection of the crushed material, and is calculated to break 10 tons of hard rock per hour, one-half of which will pass through a No. 40 sieve, and the remaining portion to be about the size of a bean.

The pulverizer acts directly under the chamber or hop of the crusher and is constructed solely for the pulverization to dust of the rock coming from the crusher; this machine has the appearance of a large Saratoga trunk, and on lifting the iron cover, is a series of paddle wheels revolving on the inside, and which reduce the gravel to dust—the paddles, when in motion, producing whirling or vortices of air, which put the particles of rock in rapid revolution and is supposed to move at the rate of two miles a minute, and it is by the friction of the particles, one against the other, that the dust is produced, and the quality of this work determined by the velocity of the paddles. Connected with this machine is a fan-blower, through which the dust is drawn by exhaustion as fast as produced, and collected into a close chamber; pressure of air upon the interior of the dust room, and consequent back pressure upon the column issuing from the pulverizer, is prevented by a pipe leading from the extremity of the room back to an opening in the pulverizer, close to its feed hopper, thereby inducing a constant circulation of air.

Under the dust chamber of the pulverizer is an iron barrel into which is placed 800 pounds of dry dust and 65 pounds of quicksilver, and is run at the rate of 25 revolutions per minute. This is allowed to remain in the barrel for the purpose of amalgamating three-fourths of an hour; it is then drawn off into an iron bucket and diluted with water, where it still further remains (one hour); after which it is run over silver plates to the tail-race. The rock is first dried and run through each of the machines and barrel run; this being found to be the best process for ore in which so much fine, light gold is contained. The advantages claimed over the common stamp are better work and a much larger amount at the same time, less wear and tear, less cost in price of machine, freight, and erection, and above all, better satisfaction in results. Mr. Layton informed us he had recently put up one of these machines at Angel's Camp, and which the agent had since visited and reported it as doing well and given much better satisfaction to the company for whom it was erected, than the mill formerly used. The starting up of the Providence Company's mill was a success; it moved with the greatest ease, without a hitch, and as quietly as if it had been at work for months. It was admired by the lookers-on, and Mr. Layton was heartily congratulated on the success with which the start went off.

Letter from Dutch Flat.

Grey's Hill.

Grey's Hill, on the southwestern slope of which the business portion of "the Flat" is built, comprises the most noted gravel bed in this mining district. It has been the theater of active hydraulic operations since the hydraulic era began, but has declined in importance until but four small claims, located near the western end, are now running. As you ramble over it, a constant view of desolate hydraulic fields is unrolled before you, and, if the day is a sunny one, you are almost blinded by the white glare of the rocks, cuts and junctions that, with decaying trestle works, crushing flumes, sinking engines and blacksmith shops, make up the deserted scene. In mining parlance, the hill is "scalped," worked out on the old level, the lower strata and bed-rock remaining to be developed. The hill contains three hundred and fifty acres, rim included; but a fair estimate of the remaining channel deposit would be two hundred and twenty acres, averaging in depth one hundred and twenty-five feet. This is a blue gravel deposit, and supposed to be a continuation of the great blue lead of the State. It has been imperfectly tested at various points by claim owners, through shafts and bed-rock tunnels, generally showing colors, and in a few instances rare prospects; but no attempt has ever been made to hydraulic it on a bed-rock level. The reader can tell as well, or nearly as well, what the lower strata would pay under hydraulic treatment as the claim owners of Dutch Flat. It is one of the thousand local mysteries of the mines that capital and skill must unravel.

Dutch Flat Blue Gravel Mining Company.

Near the center of the hill is a mine of note styled "The Dutch Flat Blue Gravel Mine," containing forty-five acres, owned by a San Francisco company. The mine was purchased by a company in 1871, and in November of the same year, preparations for hydraulic mining a second stage was commenced. A hundred men were sometimes employed, \$18,000 worth of pipe laid down, 1,000 feet of flume constructed, 1,000 kgs of powder exploded, 2,000 inches of water (afterward reduced to 1,200 inches) turned on, a run of fifty days accomplished, and the mine closed down—a mining miscarriage, re-

sulting, according to popular verdict, from the level on which the enterprise embarked. The officers of the company are, or were, L. A. Booth, President; George D. Roberts, Vice-President; T. D. Bagley, Secretary; E. B. Dorsey, Superintendent.

The Dutch Flat Claims.

Adjoining the Blue Gravel mine on the east lies the Dutch Flat claim, containing forty acres, owned by shareholders scattered from White Pine to San Francisco. In their hydraulic days, these were the most celebrated claims in this part of the county, furnishing employment to a large body of workmen, and paying handsome dividends to stockholders for the period of eight years. They are now noteworthy as having been very recently handed to the Dutch Flat Blue Gravel Company. It is currently reported that, having secured these adjoining acres, the Dutch Flat Blue Gravel Company purpose speedily reopening on a level that will practically demonstrate what its mines are worth.

Freighting a Ship.

It is the opinion of several prominent Dutch Flat mine owners that the Blue Gravel and Dutch Flat mines combined contain money enough to "freight a ship." The estimate is perhaps a liberal one, but undoubtedly they contain an immense amount of the precious metal; though it is easy to comprehend that the success attendant upon hydraulic mining must depend on the manner in which the mines shall be opened and handled; for a ship may be sunk, as well as freighted, by the management of a mine.

The balance of the hill is made up by small groups of claims, containing three to ten acres to the group, owned mostly by workmen, and is of small practical importance in its multiplicity of ownership, but presents a fine chance for capital to create an extensive mine.

Price of Mines.

The Blue Gravel and Dutch Flat mines are reputed to have been purchased and loaded for the sum of one hundred thousand dollars each. The public ear is greatly saluted with round sums in regard to mining transactions, and the cautious listener becomes accustomed to throw off at least twenty to thirty per cent. of the floating statement. The smaller mines claim relative value with the larger, but fluctuate in price as new enterprises and fresh capital are sent in the field.

Hydraulic Claims.

Approaching the lower end of the hill you arrive at the "Deep Shaft" claims, delivering six hundred and fifty inches of water through one of Hoskies' 6-inch nozzles, under a pressure of two hundred and fifty feet, supplied by pipe fourteen inches in diameter. They belong to the Cedar Creek group, and are locally distinguished as having been E. L. Bradley's pet claims before his transfer of property to the London company. They were always obstinate claims to work, made up of adamantine banks, and therefore seemed to possess a peculiar charm for their former patron—a man who never turned aside for obstacles, but who persistently battered down every obstruction on his pathway, from a life of daily labor in the mines to the realization of a splendid fortune and a valley home. The new management has been fighting these banks a few rounds, and has concluded to throw up the sponge. The claims are closing down, their slight top stone is being washed away, their huge nozzle now scorching piping toward the skies, as if calling on Newton to witness its heroic closing struggle. Under the direction of the London company, the Blue Lead has lately been pretty well prospected in these claims, through a shaft with radiating tunnels. The work extended through a period of six months, and was recently closed down. A thousand of the *Union's* readers are working in the Blue Lead in this State, and keeping them in view, the writer will not assume to tell what the lead "averages to the pan for the last four feet." In the late work at this point prospects were obtained that, in some instances, almost warranted drift mining.

The Enterpriss Claims.

These claims adjoin the Deep Shaft on the north, and are Cedar Creek property. They are running day and night, employing five hundred inches of water through one of Hoskies' six-inch nozzles, supplied by main pipe fourteen and eleven inches in diameter, under a pressure of one hundred and fifty feet. These claims were opened this season, and bid fair to be exhausted by this season's close. They are located on the rim, and are washing to the bed rock. The banks are low, and high spurs of bed-rock impede the progress of their flumes. They are completing their second run of the season.

Badger Claims.

To the southwest of the Enterpriss, lie the Badger claims, owned by Grey & Co. They run day and night employ three hundred and fifty inches of water through one of Hoskies' four-inch nozzles, fed by twelve-inch pipe, under uncertain pressure. The bank is made up by a low front wall of gravel plastered on to a high back wall of clay—the clay from this point in northeasterly and southwesterly directions appearing to usurp the slope or level occupied by the hydraulic gravel at the upper end of the hill. The gravel yields slowly before the pipe; the claims have many difficulties to contend with, and have not made a thorough clean up this season.

The Sailor Claims.

Last claims of all, to the northwest of the Badger and owned by Simons. They consist

of a small island of gravel sitting in a sea of clay, and contain four to five runs. They work day and night, using 250 inches of water through two small pipes, and sluice their tailings through a flume 2½ feet in width.

The Flag of St. George.

Our English consuls seem determined to post themselves in regard to the profits of hydraulic mining in California, apparently having adopted the plan of buying up and mining a few thousand acres of our gravel rangers, by way of ascertaining what the whole may be worth, "you know." Last week the Little York Ditch and Mining Company's interests, consisting of 60 miles of ditches, 100 acres of mining ground, saw-mill, teams, etc., were transferred to a London company. The style of the company is: Little York Gold Washing and Water Co., Ltd; headquarters, London. Ball, President; Henry May, Secretary. Thus the Cross of St. George has been successively planted (at Bunker Hill prices) in the three contiguous towns of Dutch Flat, Little York and You Bet.—*Cor. Sac. Union.*

What the State Geological Survey has Accomplished in Indiana.

Prof. E. T. Cox, State Geologist of Indiana, in his annual report of the Geological Survey of that State, just published, says:

At the present rate of progress of mining in Indiana, a few more years will develop an endless chain of mines over the entire area of the coal field of Warren county on the north, to the Ohio on the south, with a belt of blast furnaces girdling the zone of the block of iron smelting coal.

The old furnaces are all in blast and making good yields of iron. Arrangements are being made to build a new furnace, to be placed beside the Brazier furnace, which is to be blown by the machinery originally designed to run two stacks. Another to be built at Terra Haute by the Virgo Iron Company, and one has already been built at Shoals, in Martin county, which will use principally native ore, referred to in my report of 1870. This ore occurs in great abundance in Martin county, and the semi-black coal found in Sampson Hill, a short distance south of Shoals, will supply it with fuel.

It is also highly satisfactory to know that by making known the extent and economical value of the minerals, the survey has had the effect to stimulate mining and manufacturing interests wherever it has been carried. I might further illustrate this by citing the increased activity in mining operations which it has brought about in Davies county. At Washington, in this county, mines have been in operation since the opening of the Ohio and Mississippi Railroad in 1856, and the business has grown to fair proportions, but I think it may be said, without fear of exaggeration, that coal mining has received an impetus, and operations in that time have increased with a rapidity heretofore unknown. Lands which were rated at fifty and one hundred dollars per acre have advanced to two and three hundred dollars per acre, and capital from various parts of the country has been turned to this county for profitable investment. Instead of having their mining operations restricted to one seam—the Washington coal—the survey has pointed out the existence of no less than eight distinct seams, five of which are of a workable thickness.

AGRICULTURE AND MINING COMBINED.—The vineyard now being planted by the Natoma Water and Mining Company, at Alder Creek, near Folsom, Sacramento county, is to contain 150 acres, and will contain over 70,000 vines—all foreign varieties, principally White Muscat and Flame Tokay. The vines were all rooted at Taylor's Nursery, last season. They are being planted at the rate of 7,000 per day, eight feet apart. Between every twenty rows a roadway is left. The vineyard is alongside the Sacramento Valley Railroad, and extends about a mile in length, and is so situated that it can all be irrigated from a large reservoir at the upper end. The company have also planted out 1,600 pear trees of choice varieties, and next season intend to plant 16,000 plum trees, on a tract of land now being prepared near Willow creek.

KLAMATH COUNTY MINES.—Mr. James Beith, who is just in from Sawyer's Bar, Klamath county, reports that Robert Burns, of that place, has discovered a very rich gold-bearing quartz ledge in Eddy's gulch, about two miles from Sawyer's Bar. A company has been formed, and the owners of the ledge now consists of R. Burns and his brothers Wm. and D. Burns, D. Casey and James Gould, all old residents of Sawyer's and Wm. A. Farris, the present Superintendent of the Black Bear mine. The newly-discovered ledge prospects exceedingly rich, far exceeding the famous Black Bear.—*Humboldt Times.*

FREIGHT TO BE RAISED.—The Virginia and Truckee Railroad Company are about giving the "crank another turn." Mr. Herington, General Superintendent, has issued notices to the effect that on and after the 1st of next month the rates of freight on lumber will be as follows: From Carson to Gold Hill and Virginia, \$7 per 1,000 feet; from Reno to Gold Hill and Virginia, \$10 per 1,000 feet, or \$75, car load rates. There will now be a chance for teamsters to again make wages.—*Virginia Enterprise.*

SCIENTIFIC PROGRESS.

Interesting Researches--Effect of Electricity on Oxygen.

In a paper, lately addressed to the French Academy of Sciences, M. Chabrier describes certain researches of his, which promise to be fruitful of most important discoveries. Reasoning upon the well-known fact that ozone is simply oxygen so modified as to render it a much more active agent than when in its natural state, the idea struck him that, if oxygen can undergo a change through the influence of electricity, other elementary gaseous substances might also be endowed with a similar property. He accordingly selected hydrogen, and subjected it to the same ordeal, by which ozone is generated. In his very first trials he remarked that, after undergoing electrification, hydrogen presented all the reaction characteristic of ammonia, and that the nearer the wires of the induction apparatus were brought to the orifice of the tube during the operation, the more perceptible became this "activity" of the gas.

This led him to bring the latter in its electrified state into contact with oxide of silver. His first attempt was unsuccessful, he having taken some oxide which had been prepared more than a month before and had assumed a green olive tint. But on repeating it with some prepared on the spot and deposited in a still moist state on a small porcelain disk, the oxide soon became black, and its surface appeared sprinkled with brilliant particles having the appearance of metallic silver. Observing this transformation carefully through the microscope, the shining particles seemed to multiply and then grow larger, assuming the appearance of globules of mercury. This action gradually became weaker, and after a certain time ceased entirely. The experiments being repeated in several ways, it became evident that oxide of silver might be reduced to a metallic state by electrified hydrogen.

Examined under the microscope, after several hours exposure to this new agent, M. Chabrier remarked that the globules ultimately lost their shape, leaving behind a small crystalline skeleton. On exposing them again to the action of electrified hydrogen, he perceived that the globules seemed to have emitted an argentine fluid, which had become solid, and appeared even to have been projected to the same distance. Hence he concludes that the new agent had not only the power of reducing the oxide of silver, but also of forming with the metal thus obtained a fluid of an unstable nature, capable of "spouting" like certain melted substances in a crucible.

SINGULAR CAUSE OF FIRE.—The works of the Rubber Cloth Company, at Nantucket, Conn., were destroyed by fire several weeks ago under the following singular circumstances: The building an old one of wood, was 100 feet or more in length. The cloth is prepared by treatment with alcohol and linseed oil, and, during the operation, is passed over wooden rollers and extended along, for fifty feet or more, into a smaller vulcanizing chamber some thirty feet in length, where it is hung in folds from the ceiling to be dried and heated. The heating is done by steam pipes. Electrical sparks had been noticed in passing the cloth along over the rollers. On the morning in question, which was exceedingly cold, the sparks had been observed to crack louder than usual. A snow storm was in progress at the time. The workman, who was engaged in hanging the folds of cloth in the vulcanizing chamber states that suddenly there seemed to come from his hands a sheet of electric fire, there was an explosion, the place was instantly in flames, and himself and others had to run for their lives. The building and contents were soon destroyed. The theory is that the fumes of alcohol and oil formed an explosive gas in the apartment, which the electrical sparks ignited, just as gas ordinarily is fired by electricity.—*Scientific American.*

LIGHT.—According to the theory generally received at present, the whole universe is an immeasurable sea of highly attenuated matter, imperceptible to the senses, in which the heavenly bodies move with scarcely any impediment. The fluid, which is called ether, fills the whole space—fills the intervals between the heavenly bodies, as well as the pores or interstices between the atoms of a substance. The smallest particles of this subtle matter are in constant vibratory motion; when this motion is communicated in the retina of the eye, it produces, if the impression on the nerves be sufficiently strong, a sensation which we call light. Every substance, therefore, which sets the ether in powerful vibration, is luminous; strong vibrations are perceived as intense light, and weak vibrations as faint light, both of them proceed from the luminous object at the extraordinary speed of 186,000 miles in a second, and they necessarily diminish in strength in proportion as they spread themselves over a greater space. Light is not, therefore, a separate substance, but only the vibration of a substance, which, according to its various forms of motion, generates light, heat, or electricity.

A SINGULAR INVESTIGATION.—Most of our readers are acquainted with those singular little pieces of glass called "Prince Rupert's Drops" or "Dutch Tears," elongated drops of glass, with a slender stem at one end, which, when broken while the other end is held firmly between the thumb and forefinger, the whole mass instantly crumbles into fine grains, producing by the concussion, a stinging sensation in the hand holding it. Dr. De Lanyne has recently communicated to the French Academy of Sciences that, on investigation, instead of finding the glass when broken in irregular particles, like ordinary glass, he found that each particle was in the form of a small cone.

By enclosing the drops in plaster of Paris, he succeeded in breaking them without allowing any of the fragments to change their position. He then found that each particle is a little cone, with its apex always turned towards the point where the force causing the rupture had been applied. The little cones are partly enclosed one within the other, and are remarkably regular in their arrangement, and a similar regularity of rupture is observed in glass rods which break spontaneously in consequence of their not being sufficiently annealed. The rupture may be accompanied by an elevation of temperature of about 70 deg Fahrenheit, and often by a flash of light. Small things frequently furnish a clue to the explanation of great phenomena, and M. Elie de Beaumont thinks that something analogous to what takes place in the little Rupert's drops is constantly going on in the interior of our earth.

MEASURING THE LIGHT OF THE STARS.—IMPORTANT INVENTION.—The photometer has recently been quite successfully applied to astronomy in measuring the light of the heavenly bodies. Of course the instrument so used is quite different from that employed to compare the relative intensity of flames here on earth. The astronomical photometer, invented by Tolner, is based on the polarization of light. By attracting such a polarizing photometer to a telescope, he has been enabled to determine the comparative luminosity of divers heavenly bodies with greater accuracy than had previously been possible.

The special importance of this discovery or invention arises from the fact that the observations on the comparative luminosities of different stars will now be so accurate as to furnish reliable data on which future astronomers will be able to determine what changes have taken place in course of time; changes which are sometimes very great and of the utmost importance to the extension of our knowledge of the nature of the heavenly bodies. As a standard of comparison, he uses the light of a lamp shining through a pin-hole; and in order to be independent of the perhaps variable light of this lamp which may differ on different nights, he compares two stars with the lamp, and only notices the difference between the stars.

SUPERHEATED WATER.—Professor Tyndall makes a very pretty lecture-room experiment, showing the explosive nature of superheated water, or water heated above the boiling point, after all the air has been expelled from it. The Professor takes two test-glasses covered with a bell-jar; in one he puts a small piece of ice, which he covers with a layer of oil; in the other undistilled water, also covered with oil. Both are brought to the boiling point; as soon as the one free of air reaches the degree of vaporization it explodes, dashing the oil over the bell-jar. The water in the second test tube boils away quietly in the usual manner. This experiment has a peculiar significance in connection with the steam boiler explosions are often attributed to the fact that after water has been boiled for some time, it loses the air which was dissolved in it, and when this point is reached it suffers a peculiar modification. Being deprived of air it does not vaporize slowly, but explosively throughout its whole mass.

HEAT OF THE SUN.—There are few things in which physicists so much differ as in their estimation of the temperature of the sun. Some hold that it is not greater than that of the electric arc, (whatever that may be), others double that heat. Father Secchi estimates it at 2,000,000 Fahr., and Ericsson at 6,000,000. Herschel gives the following curious idea with regard to the heat of that luminary. Suppose a rod of ice of sufficient length, but 45 miles in diameter, was projected toward the sun at the inconceivable velocity of ten millions of miles per minute, and under such circumstances as could concentrate the entire heating power of the sun upon the end of that rod, (representing a disk of 45 miles diameter), the advancing rod of ice would never reach the sun, because its approaching point would be melted away as fast as it came!

TO PRESERVE CHEMICALS.—Earthen vessels are constructed with a groove near the top. The groove is filled with castor oil, with which the cover is brought in contact in closing. The connection with the outer air is thereby interrupted. Chloride of lime, for instance, was preserved in this manner for two years, without deteriorating in the least by the absorption of moisture.

PICRATE OF LEAD.—It has been found that alk goods containing picrate of lead frequently take fire in railway transit. Investigation has shown that the fire is due to the picrate of lead, which, under such conditions, ignites with very little friction.

MATCHES WITHOUT SULPHUR, OR CHLORATE OF POTASH.—It has long been a desideratum to secure a match which could be readily ignited without the production of the unpleasant fumes of sulphur, or the dangerous explosive spark due to the nitrate of potash. And it is now reported that a Frenchman, named Eschach, has patented such a match, which can be ignited by rubbing on any rough surface, and which does not become damp when exposed to the air for a long time. The splints are first soaked in a hot solution of some fatty body, and then dipped in a paste of which the following are the constituents: phosphorus, 7 parts; gum, 7; do.; nitrate of lead, 40; powdered glass, 5; water, 10.

EFFECTS OF SULPHUR ON PLASTERING.—We find in the *Builder*, a note on the effect of sulphurous gases emitted from the coal upon plastering, in which it is claimed that the hair in the ordinary plaster becomes the means of disintegrating if unprotected by a covering of a character to resist the gas emitted by the coal, which contains more or less sulphur.

IN AID OF SCIENCE.—Cyrus W. Field has notified Prof. Henry of the Smithsonian Institute, that all announcements of important astronomical observations or discoveries will be received or transmitted by the Atlantic cable free of charge.

MECHANICAL PROGRESS.

Welding Steel.

The property of weldability, as well known, is possessed by wrought iron—not, however, by pig iron; hence it is evident that steel must exhibit a very different deportment in this respect, according as it approaches in its composition the one or the other. Many kinds of steel of a low percentage of carbon weld almost as easily as wrought iron; others with a higher percentage weld with more difficulty; while, finally, pig iron, which is rich in carbon and for which the degree of softening and that of melting are near each other, can either not be welded at all, or only by particular means. Not only does the absolute amount of carbon in the steel determine weldability, but also the manner in which it is distributed through it.

Steel requires a lower welding heat than wrought iron, but if exposed to too high a temperature, it burns, and, in consequence, becomes so friable that it breaks to pieces when hammered. This circumstance is to be taken into consideration in welding steel and wrought iron, which is so often done with tools, rails, etc. This operation is partly in order to produce the articles cheaper, partly to give to the parts most exposed to wear the hardness of steel, and to others the tenacity and inflexibility of wrought iron. In this case the wrought iron is first placed into the fire or both are heated separately; besides, particular fluxes are applied for the purpose of protecting the steel from burning, and to facilitate the unification of various materials.

The most essential conditions to be fulfilled in welding are, that the pieces to be welded possess a pure metallic surface, and that they be properly formed in the first instance, so that they may be united without delay. Where it can be done they are put together as well as possible before they are placed in the fire. The steel must be heated as rapidly as possible and excluded from the air; best with charcoal and good coke, since coals, on account of the fact that they contain sulphur, produce a thin layer of sulphate of iron, which prevents proper welding.

In order that the parts to be welded may remain pure in the fire, they are covered with a proper material, which forms a liquid, protective layer, and at the same time dissolves the oxide. For this purpose sand or clay is used, by spreading them upon the parts in form of a paste; the operation succeeds much surer and easier with less fusible coverings. For cast steel, ground glass, heavy spar, or anhydrous molten borax serve well. For English cast steel, common builders' mortar may be used, or, in lieu thereof, a mixture of clay and sand.

Aside from these more simple means, special welding agents are employed, the composition of which permits the formation of an easily fusible slag. Among the mixtures recommended we mention the following: 64 parts borax, 20 parts sal-ammoniac, 10 parts yellow prussiate of potash, 5 colophony. These ingredients are heated with $\frac{1}{2}$ litre water and some alcohol, until dry. Another preparation is composed of 41.5 parts boracic acid, 3.5 salt, 15.5 prussiate of potash, 8 calcined soda.

Habich prescribes 7 anhydrous prussiate of potash, 2 calcined soda, and more or less burned borax, according to the nature of the steel. Ermer recommends, to dissolve in water, 8 borax, 1 sal-ammoniac, 1 yellow prussiate of potash, and to evaporate the solution at a low heat to dryness. When strongly heated, violent explosions may occur by the formation of chloride of nitrogen.

In welding, at first light, then heavy blows are given, so that the slag may escape from the joints, whereupon the outer surfaces are united.

THE BESSEMER PROCESS FOR STEEL-MAKING.—It is rapidly gaining ground, not only in England but also on the Continent of Europe.

Cannon Casting in Sweden.

Special attention is paid in Sweden to the production of what is called "cannon iron," or cast iron, made especially for the manufacture of heavy artillery. The ore from which this iron is smelted is taken from three different mines, and from those only. From one of these mines, Foerola, 80 per cent of ore is taken and mixed with 10 per cent each of ore from Nartorps and Stenoholm, from which proportions experience has shown the best results can be obtained.

The iron so obtained, exhibits an amount of elasticity extraordinary for cast iron—a quality of great importance in cannon.

The natural superiority of the iron is largely improved by a peculiar mechanical device employed in the casting. In this process instead of pouring the metal directly into the mold it is poured into a receiver from which it rises in the mold, from the bottom, with a rotating motion around the core, which is hollow and kept cool first by a stream of water passing through it, which is followed by a current of cold air, during the process of cooling. With every large cannon, a small one, from 4 to 6 lbs calibre is cast, whereby the calibre of the large piece can be comparatively ascertained.

INCOMBUSTIBLE AND INDESTRUCTIBLE WOOD.—Quite too little attention is paid to the preparation of woods for construction purposes so that it may be rendered comparatively combustible and indestructible to ordinary sources of attack by rot, insects, etc. By employing some of the many preparations, already known, wooden dwellings may be made almost as safe from fire as those constructed of brick or stone, and as little liable to decay as though they were made of iron. The time will soon come when these desirable qualities will be added to ordinary lumber, for such a small addition to its first cost as to place such prepared wood within the means of any person who can build a house or wharf.

In connection herewith we refer to still another invention in this direction, by one Macomber, of London, who is said to have devised a plan for rendering wood both combustible and indestructible by insects or decay, by a single operation. He takes lumber in its green state, and having first, by hydraulic or steam pressure, or otherwise, expelled the sap, replaces it by a chemical composition of his own invention which he keeps secret, and which is to destroy the inflammability of the material. Not only this, but the liquid is to act as a preservative in other ways, preventing the wood so treated, rotting from the attacks of worms or insects.

COAL CUTTING MACHINERY.—The improvements in coal cutting machinery are such as to bid fair to work a most important revolution in coal mining. It is claimed that they have a new machine at the Helton colliery, in Durham, worked by compressed air, by which, it is said, 60,000 colliers will be enabled to produce the same amount of coal as the 300,000 now employed. Of course we should allow something for the distance which that report has traveled to reach the Pacific Coast; but the general testimony is that machinery will soon be made to do all the "colling" in coal mines, which form a large portion of the labor, and in very narrow seams, we may say, the principal portion. The saving thereby made in the waste of the coal is also a very important item.

CAST IRON PRODUCT OF THE WORLD.—The annual consumption of iron has reached an enormous figure and is still rapidly increasing. A careful estimate of the product of cast iron for 1871 is given in tons as follows:

Great Britain.....	6,570,000
United States.....	1,912,000
France.....	1,350,000
Germany.....	1,230,000
Belgium.....	895,000
Austria.....	450,000
Russia.....	330,000
Sweden and Norway.....	280,000
All other countries.....	347,000
Total.....	13,315,000

From the above it will be seen that the annual product of Great Britain reaches within a fraction of the total product of all the rest of the world.

FORCE OF THE WIND.—A singular occurrence took place at a point on the Jersey shore, nearly opposite New York, a few days since, strongly illustrative of the force exerted by the wind. While a large number of men were at work upon a ship on the stocks a gust of wind suddenly lifted the open house which was employed to roof over the work and carried it entirely away. It was 250 feet long, 80 wide and 80 feet high. Singularly enough no one was injured by the sudden removal.

BRONZE.—The doom of bronze, as a material for rifled guns, says the *London Daily News*, has been sealed. The manufacture of seven-pounders in that metal for mountain and boat service has now been given up, and orders have been issued for the construction of steel 7-pounders instead. The failure of bronze has been a great disappointment to its advocates, who only a few years ago were full of confidence in the perfection of their favorite material.

HEAVY ARTILLERY.—As an evidence of the possibilities in the way of the construction of heavy artillery, it is stated that Mr. Bessemer says he is prepared to supply guns that shall fire balls of five tons at the rate of one a minute, and to construct a gun to fire a ten ton ball.

Julia.
Letter of the 5th says the progress on the different drifts during the past week was 9 feet, making the total length from the shaft 196 feet. The rock continues very hard, all blasting rock; drift north from main drift, starting 98 feet from the shaft, made 4 feet during the week, making 90 feet from main drift north. Are crosscutting both east and west, all in ledge matter, looking very well; will develop something soon probably.

Ophir.
Letter of the 8th says the ledge of quartz found a day or two since in east drift of the 1665-foot level lies 345 feet east of the shaft, and well placed between clay and walls. The drift is all in ledge matter which, although assaying but little as yet, promises well. Drift east from the bottom of the winze from this level will cut the same ledge in about 20 feet. The body of quartz found in second station looks well, but has not been reached yet by the drift from the bottom of winze. No change elsewhere.

Pioche.
Letter of the 2d says they have shipped about 100 tons of ore to the Meadow Valley mill. They were to start on our ore yesterday. Have found another cross-cone in the bottom in driving to the east. Car samples for the 31st were \$297.04.

Pioche-Phenix.
Letter of the 31st says the new shaft is now down a depth of 60 feet. The contractors came on the ledge yesterday. It is now 2 1/2 feet wide, and assays \$116.23.

Page & Panaca.
Letter of the 31st reports a change, at last, in the mine. They struck in the drift, 601 feet from the shaft, a small ledge or seam of ore, assaying \$6.93 per ton, and it may possibly be the main ledge, but small at that point. The water has been as some, causing us to timber a portion of the drift.

Raymond & Elv.
Letter of the 1st says the eighth-level drift southeast is 55 feet in, and through large crosscut; 7th level drift east, 116 feet; drift west 86 feet—good ore coming in; east winze down 29 feet. On 6th level, west from shaft, we are sinking a winze which is now 21 feet deep, with two feet of good ore in the bottom. The various stops are looking and yielding well. Traces to old Panaca shaft are nearly completed and are entirely satisfactory. The mills are running well, with good supplies of ore on hand. Will run both of the mills through this month on third-class ore.

Dispatch from the Superintendent under date of April 4th says: "I shipped yesterday \$11,000." This makes the total for the month of March, \$24,391.

Rye Patch.
Superintendent writes under date of April 7th: "I forward this day one bar halion, weighing 614 ounces, and will make another shipment to-morrow. I am putting in another pan to-night, and as soon as I receive the tabs ordered at Miners' Foundry for two additional pans you may rely on daily halion shipments. The mine is promising better every day. The new incline is connected with north drift; hoisting gear and tracks are in splendid order, and ore is accumulating in great quantities on the dump."

Silver Peak.
Letter of the 2d says there is no change in the mine. The drift both ways continue in good ore. Can probably make arrangements with the five-stamp mill at Bullionville to start on our ore. The average assays for the 31st were \$115.63, and for the 1st inst., \$167.63. Are confident that the mill will pay, and are sure that we have a good mine.

Sierra Nevada.
Letter of the 5th says that everything is running in good shape. The mine prospects and looks as well as at any time for the past three months. The northwest body of ore is holding out very well; the average width is about five feet; opened about 50 feet in length, and about 40 feet high. This ore will pay from \$6 to \$10 per ton. Mill runs splendidly. They worked last month 1,357 tons of ore.

Savage.
The weekly report, for the week ending April 6th, gives the following summary of operations: Ore extracted from the mine, 213 tons 1000 pounds; average assay value of the ore extracted, \$24.30 per ton. The ore was taken from the following sections of the mine: north mine, 2d station, 139 tons 1000 pounds; south mine, 13th station, 54 tons.

Woodville.
Letter of the 3rd says the mine is looking well throughout; plenty of high-grade ore in sight; south drift is now in 225 feet on the ledge. Ore is 4 feet wide; north drift is in 80 feet; the ore is improving as we get north. The other levels are all looking well.

New Incorporations.

BETTS' SPRING MINING CO.—April 8. Object: To manufacture and vend carriage and other springs. Capital stock, \$50,000, in shares of \$100 each. Trustees—Louis Lierson, Frank Locan, Alexander Austin, Gustave Holland, Henry Marshall.
EDDY G. AND S. M. CO.—April 8. Location: Mud Springs, El Dorado county. Capital stock, \$250,000, in shares of \$100 each. Trustees—Louis Lierson, Frank Locan, Alexander Austin, Gustave Holland, Henry Marshall.
PRAIRIE STEAM PUMP CO. OF CALIFORNIA.—Object: To manufacture and vend pumps of the Prairie patent, described in the last issue of the PRESS. Capital stock, \$150,000, the whole of which has been actually subscribed. The Directors are, L. F. Rankin, A. G. Stiles, R. T. Knox, Eugene N. Riatte and A. V. Brayton.

CENSUS OF MANUFACTURES.—The last census furnishes some instructive and suggestive figures on the manufacturing interests of the United States. New York and Pennsylvania lead the van. New York and Philadelphia are the leading cities, each producing about three-fifths of the manufactures credited to its respective State. Thus New York City, with 129,577 operatives, produced in 1870 \$333,951,520 of goods, whilst Philadelphia, with 95,421 operatives, produced \$322,004,527. These two cities in 1870 manufactured more than one-seventh of the entire product of the country. The third in the list is St. Louis, with a product of \$158,761,018; the fourth, Middlesex County, Massachusetts, which includes Lowell, and returns \$113,147,270; the fifth, Suffolk County, including Boston, \$111,380,840; the sixth, Essex County, which includes Lawrence, \$96,990,868. Following them in regular succession are the respective counties in which are located Chicago, Pittsburgh, Providence, Cincinnati, Worcester, Brooklyn, Baltimore, Newark, New Haven, San Francisco, Hartford, Manchester (New Hampshire) and Louisville, the latter having \$20,364,360 annual product.

MINING SUMMARY.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned:

AMADOR COUNTY.

KENNEDY.—Amador Ledger, April 5: It has been some time since we have mentioned this mine, but it has been running smoothly and crushes out its regular \$20,000 per month. The new shaft is progressing finely, and is now about 280 ft. down. The ledge in the old shafts are improving and the rock is richer and of better quality than formerly taken out.

CALAVERAS COUNTY.

GRAVEL MINES.—DURIEA HYDRAULIC.—Calaveras Chronicle, April 5: Work is being steadily pressed forward with satisfactory results. Three hundred inches of water, with a pressure of 250 ft., are conducted to the claim in a 12-inch iron pipe and precipitated against the rock through a 3-inch nozzle. It is knocking a hole in Stockton ridge large enough to contain the pyramid Cheops.

BROWN & CO.—The mine was worked a number of years ago and found to contain a large amount of pay gravel; but the tunnel run at that time was too low necessitating work through a chute, which increased the expense so inordinately that the ground was finally abandoned. Messrs. Brown & Co., are now engaged in running an incline to reach the diggings, and have their work so nearly completed that they will be taking out gravel in a week or two.

BRACKETT & CO.—These gentlemen are busily engaged running a new tunnel to tap the channel higher up the ridge. It is already in a distance of 250 ft., leaving but 30 to run. They expect to strike gravel in about 3 weeks. A vast amount of money has been taken from this mine within the past five years, and when the new tunnel is completed the yield will be greater than ever. A ten stamp mill is to be put on the claim.

SIMPSON & CO.—Their mine is the handsomest and most substantial piece of workmanship of that character we ever saw. It has a grade of about 1 ft. in 12, and is supplied with the best known appliances for saving gold. A 12-inch iron pipe is used to convey water to the mill, and 300 inches are to be used—having a fall of over 200 ft. There are two strings of sluices connected with the mine, leading to different faces on the bank. The ground was worked at several years since, and paid tolerable wages with water 50 cts. an inch and the piddling manner in which operations were conducted.

MORSE & CO.—At the head of the gulch the tailings have been washed away down to the bedrock, and the work of shoveling the rock into sluices will be commenced shortly. There is undoubtedly a large amount of gold accumulated in the bottom of the gulch, as enough cleaning up has been already done to prove that the tailings are rich.

WALTERS PERCIVAL & CO.—At present they are engaged in digging a new headcut out, which, when completed, will enable them to work to much better advantage than heretofore. Water will be turned on again shortly, when we think the mine will give a good account of itself.

MOSQUITO DISTRICT.—The levels of the Dolly Varden are in good milling ore. Some 300 tons of ore on dump. The Woodcock and Lefranchi (on the same ledge), are expected to start up as soon as possible. These two mines are located on a strong vein of low grade ore, say, \$250 per ton. The Woodcock has been worked but little although the mine shows well. The Lefranchi has paid as high as \$47 per ton and has been worked to water level.

WEST POINT DISTRICT.—Ohio Con. down 130 ft. Ground easy but some difficulty is experienced from the pump choking with sand. Free gold can be seen in the ore. A drainage tunnel has been run from Deer Creek to the mine paid \$37 per ton. The Carlton mill will run on Lone Star ore. The mine looks well. The drain tunnel of J. Griggs is within 50 ft. of the nearest vein. Pascoe & Co. piping for float from the French lead, with good results. Wickham & Smith are building an overshot wheel, 34 ft. diameter, 3 ft. breast. The wheel will furnish the motive power for a sawmill—machinery will be added, to crush ore.

GWIN.—The contractors for sinking the main shaft in the Gwin 100 ft. deeper have commenced work. The ledge develops splendidly as labor progresses. There is no diminution in the yield of the mine.

HUNDON.—The work of sinking the shaft is progressing favorably, although the progress made is not so rapid as during the first 50 ft. of the count.

WEST POINT DISTRICT.—Calaveras Chronicle, March 29: The Ohio Con. is in full blast again. The new pump works well, and the ore in the bottom of shaft looks fine. Henry & Co., who have been driving a tunnel to tap two large veins at considerable depth are now extending on one of the veins. S. Haskins is working a fine vein at Summit Flat. Another rich strike has been made on Lone Star. A winze, in the middle tunnel, develops a seam of ore 1 ft. thick, and worth at least \$100 per ton. The strong chimney in the upper tunnel turns out some ore worth \$150 per ton. The average of the ore, say 8 ft. wide, will realize \$40 per ton. Roads are being cut from both tunnels to haul ore to the custom mills. The Harris at El Dorado, is improving in quality of ore, and developments are promising. The Anglo, Calaveras & Co. owners, shows very fine specimen ore. The owners estimate the ore on dump at \$75 per ton.

GOON HOPE.—We learn that hoisting works are to be put upon the Good Hope at Mosquito as soon as possible.

SYME.—We are pleased to learn that a company of English capitalists have purchased or leased the Syme near Campo Seco, and will commence work immediately. The mine has been prospected considerably, and so far as work has been done shows well.

MOSEN & CO.—Are steadily at work in their claim in Spring Gulch and we understand are doing first-rate. They are washing the tailings that have accumulated in the gulch from the hydraulic in the ridges on either side. We learn that the claim is paying handsomely—a merited reward for the perseverance and energy of the proprietors.

CONTRA COSTA.

STROCK COAL.—Contra Costa Gazette, April 5: The Muir brothers, who have been at work for some months with night and day shifts of hands running a tunnel for the Black Diamond vein, on their property near Kirker Pass, have got in something more than 160 ft., and on Friday or Saturday last, struck a ten inch vein of excellent coal. The calculation started on, as we understand, will carry tunnel something more than 100 ft. further in to strike the Black Diamond vein. Before running further, however, air stops or other provisions for ventilating the tunnel will be necessary. The tunnel will bring the coal out on this slope towards water, for shipment; and we hear that work is soon to be resumed in the San Francisco mine.

EL DORADO.

CRAM AND BERRY.—Placerville Democrat, April 5: This mine exhibits some very rich rock, and has so far paid all expenses of sinking a shaft 100 ft., which was done last summer. During the past winter operations were suspended for want of proper machinery for keeping out the water. As soon as the weather is satisfactory, the work of sinking will be recommenced. **GRACE QUARTZ.**—This mine is owned by H. A. Randall & Co., who after a month's rest and settlement of weather, have again resumed operations on their shaft, 120 ft. deep, and are sinking between two nice walls, 7 ft. apart, on a 2-ft. ledge, widening as they go down. The quartz is of bluish cast, and gold can be seen with the naked eye all through it, in thin layers. The rock assays from \$12 to \$100 per ton.

KLAMATH.

DISCOVERY.—Humboldt Times, March 29: Mr. James Bell, who is just in from Sawyer's Bar, reports that Robert Burns, at that place, has discovered a very rich gold-bearing quartz ledge in Eddy's gulch, about two miles from Sawyer's Bar. The newly discovered ledge prospects exceedingly rich, far exceeding the famous Black Bear.

KERN COUNTY.

PAPPOOSE MINES.—Havilah Miner, April 5: This mine, discovered last summer, near the celebrated Bright Star, has interested Boston capitalists, who propose to erect a ten-stamp mill near the site of the mine. A fine grade of quartz is being extracted, and a run will be made of the old mill soon.

PLACER DIORINES.—Schubert has been in town this week, and informs us that the Danascus placer diggings are producing about \$1 to \$2 per day. Water will last about 2 months yet. Voegel is doing well and working like a Trojan for a home-stake.

SAN DIEGO COUNTY.

ANOTHER RICH STRIKE AT JULIAN.—San Diego Union, April 3: A report comes from Julian City that the Swain brothers, who are located on the north bank of Deer Creek, opposite the Providence, have discovered a rich ledge of quartz is said to be streaked with free gold, and to make as fine a showing as that from the celebrated Chairot mine. They call the new discovery the "Tom Scott." The ledge is two ft. wide where opened, and looks well. The lucky finders have commenced sinking a shaft, which is now down to a depth of 20 ft.; and they announce their intention of putting in an engine to drive the mine for about 24 hours. The shaft is down 75 ft. It is being sunk perpendicularly, to cut the level at the depth of 150 ft. from the surface.

NEVADA COUNTY.

NEVADA.—Nevada Transcript, April 5: The Nevada Quartz mine is what was in early times known as the "Agassiz mine," and is located on the north bank of Deer Creek, opposite the Providence, and opened into the tunnel of the latter. The rock is rich and filled with sulphurets, and the mill is now at work upon this rock. The mill was thoroughly overhauled and repaired. The battery has a simple self-feeding arrangement, which saves considerable work, the feeding being regulated by the drop of the stamps. They have a rock-breaker, rubber rollers, and a sulphurets sifter, and other arrangements for saving gold.

MR. MITCHELL. of this city, has one of his pans in this mill. He catches what sulphurets escape the mill by a simple box and double trough. The sulphurets are worked in his pan, which consists of a cast iron pan with an oval rim, hollow underneath, and in the bottom of which shoes run for grinding. The pan is depressed in the center, the light sand is carried by the water over the rim of the pan, and the sulphurets settle in the bottom. The quicksilver is not subjected to the grinding process, and is all saved. This pan is pronounced by those who have seen it the best in use.

Now that the mine has been opened below the bed of the creek, the prospects are better than ever before.

GOLD TUNNEL.—This mine was worked many years ago. Some rich rock was taken out at a time when quartz mining was in its heyday, and afterwards it was given up and laid idle for some time.

Eighteen months ago, J. H. Helm took charge of this mine, and erected hoisting works of a substantial character, with a 25 or 30-horse power engine to run them, and making other improvements.

The incline has been sunk 450 ft. through rock about as hard as cast iron, and a tunnel run north 160 ft. A drainage tunnel has also been run from Deer Creek to the incline, so that the water has to be raised 250 ft. For the last 150 ft. in the north tunnel they have been running upon a splendid ledge of quartz, rich in sulphurets, and which will pay first rate. They have on the dump now 100 tons of rock, and few mines in the county can show a better pile of quartz.

We understand they contemplate building a mill upon Deer Creek below the mine, to be run by water power.

The prospects of the mine are most excellent, and there is now in sight enough ore to last two years.

THE MURCHIE MINES.—The mining claims of the Murchies, father and sons, are located on the east bank of Little Deer creek, a short distance above this city. Recent developments have demonstrated this to be one of the best properties in the State. They own and work three quartz mines and a gravel claim, all paying well.

LONE STAR.—The Lone Star was discovered about a year ago in running a tunnel in their gravel claims. They ran last season about 900 ft. and found 155 tons of rock, which averaged over \$21 per ton. This tunnel was on the Little Deer creek side. They commenced a new tunnel from the Big Deer creek side last winter, and ran 400 ft. at right angles, not expecting to strike the ledge, but intending to open a tunnel for their gravel claims. But they struck the ledge in this tunnel 300 ft. ahead of the old works, and found it 12 ft. thick, and as rich as when they left it in the old tunnel. The ledge and face of the ledge show free gold all through, and they can pick rock which will yield \$500 per ton. They crush all between the walls, and get from \$20 to \$30 per ton. They use no machinery, and the expense of extracting and working the ore does not exceed \$5 per ton.

INDEPENDENT AND BIG BLUE.—These two ledges, on the east of Big Deer Creek, are worked by one incline. They are taking out first grade ore, and the mines look well.

GRAVEL.—The Murchie gravel mines are located on the hill above the Lone Star, and the ledge runs into the gravel. The gravel is rich, and in washing this season they have struck quartz boulders which yield large amounts of money. The gravel also pays well.

The mill is located on Big Deer Creek, and is run by water power. The eight stamps are kept in operation day and night, and do not begin to keep up with the work. The owners propose to build a new 30-stamp mill soon, which will also be run by waterpower. The creek furnishes power enough to keep both mills in operation nine months in the year.

The prospect in these mines is most flattering. They now employ from 20 to 40 men, and in a few months will probably require many more to do the work. They have already rock enough in sight to last several years, and yet the mine can hardly be said to be fairly opened.

HOME.—This mine is located on Deer Creek, at the mouth of Wood's ravine. It is owned by Thomas Findley & Co. Last week they struck a magnificent ledge, which showed very rich in free gold. Unfortunately, shortly after they struck this rich strike, the pump broke, and while getting it repaired the mine filled with water. They are now engaged in pumping out.

ROCKY RAVINE.—Nevada Transcript, April 5: Some excellent prospects in quartz have been discovered on Rocky Ravine, north of Rush Creek, and in the vicinity of Green's ranch, about 2 miles from this city.

YELLOW DIAMOND.—This ledge was located a year or two ago, and two tunnels were run upon the ledge. Excellent ore was obtained and the indications were splendid, but for some reason the owners stopped work. We are informed by a gentleman who recently visited the mine that there are at least 300 or 400 tons of excellent rock in sight in this ledge. The ledge has been tapped in 4 different places and in each of these places it shows rich sulphuret rock.

SOUTH EAST EXTENSION.—Dr. Hughson & Co. have lo-

ated the south east extension of the ledge. On this claim they have now a tunnel in progress and are running upon a 3 ft. ledge. We have seen some rock from the croppings which is rich with free gold. The ledge is near the Green claim which is now yielding the biggest kind of pay.

GREEN'S LEDGE.—This claim is the second extension of the Yellow Diamond. The ledge at this point where it is working is decomposed, consisting of ochre and bluish quartz. They ground sluice it to the depth of 8 ft. and run off this decomposed stuff. A gentleman who saw several pans of this dirt washed says: he saw from \$3 to \$5 to the pan taken out, and the pay runs as high as \$5 to the pan in some places.

THE WORK AND PROSPECTS.—The Yellow Diamond is not now being worked, but both the other claims are, and their success will encourage others to take hold and prospect in the vicinity. The Second Extension will soon have out a crushing, and it is estimated that Green will in a short time be able to clean up at least \$1,000 for a short run at very little expense.

PENNSYLVANIA.—For some months past this mine has been in charge of Mr. Cliff of Grass Valley, as Superintendent. When he took charge, the mine was in a very bad condition, in consequence of the owners having previously used it for working it. The ore was taken out, but never it could be reached without reference to system or cost of extraction. Mr. Cliff has sunk one level of 100 ft., and run two tunnels each way, and he is now running another for the purpose of opening the mine. He is also running a tunnel north, where the largest body of ground belonging to the Pennsylvania lies, and which has never yet been opened.

ANOTHER STRIKE.—A man named Jackson went to work in the bottom of an old prospect hole on Red Hill, recently, and struck a stringer which showed pure gold. A gentleman informs us that he can make from \$20 to \$30 per day working the rock in a hand mortar, and he thinks Jackson has struck the edge of a big pocket.

MYERS' RAVINE.—A rich ledge of quartz, which has been struck on Myers' Ravine, beyond Selby Flats. We saw some very rich specimens from this ledge a day or two since, and we understand they will soon have a crushing out.

BARS OF GOLD.—Grass Valley Union, April 9: The ledge skimmed up the amalgamators of the mill on Saturday, after six days' run, and gold to the amount of about \$17,000 was cleaned up.

The Eureka, after a six days' run with ten stamps, gave a chunk of gold worth \$9,000. The bars are in San Francisco, and the mint is making the gold into coin.

TUOLUMNE COUNTY.

LADY WASHINGTON.—Tuolumne Independent, April 5: This mine, at Summitville, is owned by a California Co. Their tunnel has reached the distance of 350 ft., and the miners are running up an air shaft which will be, when finished, about 250 or 300 ft. from tunnel to surface. They have laid a track 2,200 ft. long from the mine to the mill. "Grizzly Mill," which they have leased for a year, and will put in operation in about a month. The vein looks well and ranges from 2 to 5 ft. wide.

RAIN HIDE.—Near Jamestown, has been bought by an English Co., with its corporation office in New York. They have commenced operations, and the mine will be re-opened on a large scale. The present shaft, which is nearly 400 ft., will be pushed 300 ft. further on the vein, besides sinking several smaller ones for carrying the ore. The present engaged pumping water out of the old shaft. The vein is considered on the "mother load," and ranges all the way from 5 to 20 ft. wide.

LANNES & CO.'S MILL.—At Soulsbyville is in full blast, crushing quartz gravel which came out of the Gison at that place. The hoys are making it pay.

AT THE NEXT.—At the next, a running parallel with the Soulsbyville vein, is being opened up. The Company have been getting out and crushing rock with favorable results, and work is still progressing.

LOUISIANA.—Near Cherokee, owned by Capt. Lombardo, has recently been sold to Lafayette Maynard of San Francisco, conditionally. The purchaser is to furnish the vein prospect, and work the mine for one-half of the same, or by paying \$50,000, but the owner is purchasing the whole of the property. Work will shortly be commenced.

GOLDEN GATE.—In a visit to this mine, a few days since, we found the Superintendent, hard at work with his men, driving the tunnel, which is a splendid piece of work, and is now in 150 ft. They expect in about two weeks to strike the ledge, and further on the drift where the chute is. In this shaft, at a depth of 40 ft., the vein is 6 ft. wide, and prospects from \$10 to \$500 per ton. Near the surface it only prospects from \$5 to \$10. If it increases in like ratio, at 150 ft. deep, where the tunnel will tap it, the yield will be immense. The contract is to run the tunnel 300 ft. with vein 20 ft. wide, hence, the surface; but at present they will go to the first shaft as above stated.

SPINO GULCH.—Sonora Democrat, April 5: This mine is being quickly worked, its promise of richness improved rapidly with every development. During March, 100 tons of ore was reduced, in nineteen days' running, yielding 18 1/2 ounces of gold of about \$3,000 value. The vein from which the ore was taken is 15 ft. in width. The company are now extending their tunnel 75 ft. North and erecting hoisting works.

Nevada.

BELMONT.
EL DORADO CON. CO.—Reese River Revue, April 5: This company made their monthly clean up for March. They have reduced about 600 tons of ore from the company's Arizona mine during the month, and have shipped over \$82,000. The mill will soon commence on the rich ores from the El Dorado mine.

EL CHIMNEY.—The late strike in the El Dorado mine 125 feet north of the main incline is proving to be an immense deposit of black sulphurets ore. This body has been drifted into 100 ft. in the 340 ft. level, a winze sunk 40 ft. into it, and the 400 ft. level is into the same body 20 ft. The ore in the 400 ft. level is getting better every day. The whole drift, 550 ft., is in the pay strata with water foot wall not showing in sight. This is admitted by all who have seen it, to be one of the largest chimneys of sulphurets ore ever found in Eastern Nevada. The ore averages about \$180 per ton. The south body in this mine increases in size as work progresses, and the ore holds its average richness, paying as it goes to the mill about \$100 per ton for the whole vein.

BELMONT CO.—Are stopping in the 190 ft. level in the Onfield mine. The lately-discovered body of ore about 700 ft. north of the main incline is much more extensive than was at first expected. The hoisting works on the Highridge shaft are all framed and ready to raise. As soon as the machinery is ready to raise the ore a full force will be put on and the mine will be thoroughly opened.

MONITOR CO.—Are stopping out in the upper levels. The supply of first class ore is holding good. They have sunk two winzes from the lower tunnel level, north of the tunnel, 100 ft. deep; are now drifting each way from the winzes. Monitor mill running steadily on Monitor ore, and working about 70 men.

NEW DISCOVERY.—Frank Stenler, in digging a foundation for his cabin, cut into a strata of fine chloride ore. He made his location at once, and this morning commenced sinking in good earnest. He has already taken out several hundred pounds of splendid ore. This location lies midway between the Monitor and El Dorado mines, and is in just the place to prove of immense value to the lucky owners.

WASHOE.

WASHOE.—Gold Hill News, April 5: Sinking the new shaft is making fair progress, the entire size of the shaft in good ore, showing plenty of rich sulphurets. The ledge continues very solid and hard, requiring continual blasting.

BELCHER.—Daily yield 440 tons. Eighty tons per day are taken from the 1,300-ft. level, through the Yellow

Ventilation of Mines.

This important subject was animatedly discussed at a meeting of the Scientific and Mechanical Society at Manchester, which was evoked by a paper with this title, by Mr. Haoking. The defects of ventilating by means of rarifying furnaces were pointed out. Exhaust fans were said to be found uncertain, on account of the wear and tear; and the liability to breakage and stoppage, and steam-jets—as they had hitherto been applied—were admitted to be a failure. It is, however, a fact worth knowing, that the steam-jet has lately been very successfully applied by Mr. G. L. Scott, of Gorton to a mine in Wales. Unlike previous attempts, the jets have, in this instance, been placed on the surface, sideways to the up-cast shaft, the mouth of which is sealed. A number of plain cast-iron cylinders are placed in an upright position, with a steam-jet applied at or near the bottom of each, steam being supplied by two boilers, one of which is kept in reserve. Here we have the whole apparatus on the surface, moving parts being entirely absent, and the danger of an underground furnace avoided also. The arrangement is said to be quite a success.

Bathing in the Breakers.

At Hawaii, Sandwich Islands, a favorite amusement of the natives, and foreigners who have attained the art, is swimming in the surf and diving beneath its foaming crests as they successively chase each other to this shore. Our illustration depicts a merry group of native girls each with their surf-board on which they rest, dive or propel themselves along with inimitable grace, ease and safety. A writer in the *Illustrated Press* says of the scene:

Hoomauna and all the rest of them are off for the beach now—they say the surf is good to-day for bathing. Kapello has gone, and beckons us. We are good swimmers, and why not, with the modest though narrow tapa that hinders nought in action or figure, around the middle of each of us?

A merry, lively crowd. Noise of surf and laughter, action, motion, grace. The breakers are certainly stiff; they knock you over again, without the least ado, until you learn to bestow yourself properly—as the natives do. You quickly learn to dive under each one as it comes along, and to catch your breath in time to be sharp "end on" for the next. That trick learned, and you presently begin to laugh at the terror of Neptune yourself. You venture out; you are all right. Why should anybody get drowned in the breakers.

Hoomauna comes sailing by on her surf-board at railroad speed. You try it again and again, but the breaker refuses to pick you up. You get tossed every time. There is an art in it more difficult to acquire than skating.

In sheer animal spirits you strike out for the farthest line of breakers beyond the outermost swimmers. One of the natives beckons you back, but you do not understand what she says or means. Kapello enlightens you after you have dressed. "You ought not to have gone out there—it is deeper, and the sharks come in as far as that."

APPLICATIONS FOR DISINCORPORATION.—The Eberhardt M. & M. Co., White Pine, has filed a petition in the County Court for disincorporation. The reasons set forth are that the mines and property of the corporation have been sold. The application is made by order of a vote of the stockholders on the 27th of March, at a meeting held that day, at which more than two-thirds of the capital stock were represented. The corporation has no outstanding debts, claims, demands or liabilities.

The Aurora Consolidated S. M. Co., has filed a similar petition, a majority of the shareholders having voted to disincorporate.

STRIKE.—The Reese River *Reveille* states that a short time ago a vein of ore was struck in the cross-cut running north-east from South America shaft on Lander Hill. Seventeen tons of ore were taken out in running a drift seventeen feet on the vein. The rock was not assorted, but every pound taken out was worked, averaging \$198.38 per ton. The Manhattan Company had just completed the construction of a cage for the shaft, and about two tons per day of the same quality of ore is being taken out.

An oxy-hydrogen flame furnace of Steven's patent will shortly be erected at Eureka, Nevada.

Little Cottonwood Mines.

A correspondent of the *Alta* writes as follows from Little Cottonwood, Utah: Last Thursday, in company with some others, I started for Granite, chartering a dog trail, similar to the Laplanders, and proceeding with racehorse speed over the frozen snow. After twenty minutes' ride we arrived at Tannersville, just four miles, although in many places our trail was uneven, requiring some considerable caution in the attitude in which we declined to prevent numberless summersaults, maimed limbs, splintered ribs and cracked craniums.

At Tannersville the snow was melting very fast, and we had not been gone long from there when a snow-slide came down from above the old Buel smelter, taking away the engine-house and lodging in the trail. This is the first slide that has occurred there for years, and was very likely caused by some loose rock moving from a cliff above.

Last Saturday a large force of men from here and Granite opened the road from Tanners to Granite for wagons, shoveling out the snow and ice, which has greatly improved them, and aided not a little to the shipment of ore.

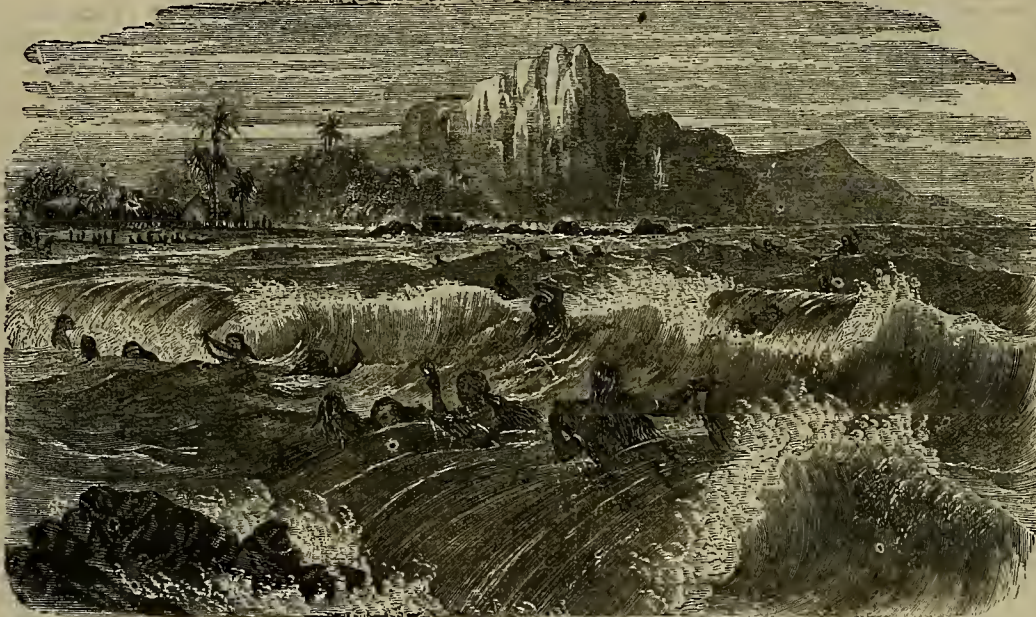
The Granite Quarry.

This is the most natural and extensive granite quarry in Utah, and perhaps will equal any in the world. On each side of the cañon, and for miles in length, are solid mountains of this rock, and of superior quality. It is from this quarry that the Mormon Temple is to be reared,

gold along the bed of the Creek between here and the mouth of the cañon since the first silver mines were opened, but with no great success. Of late a report is circulating that gold has been found below Tannersville, but as no proof can be made it is thought to be a humbug; yet the discoverers say they will prove their statements as soon as the snow will allow them to proceed further.

New Arrangements for Hoisting.

At the Minnims Colliery, at Willenhall, belonging to Mr. Matthew Tildesley, some winding machinery has just been put up, which is attracting much attention in the locality, and that deserves to be widely known, for it seems to be applicable to pits of which the depth is not very considerable. The machinery embraces not only compact winding gear, but likewise the means of preventing over-winding, that merit the consideration of colliery engineers. Boiler, engine and winding gear are all at the pit's mouth, and cover a space of only a few yards square. The engine and boiler are both under one roof; the grate is constructed so far as to effect complete combustion, notwithstanding that the slack used has hitherto been regarded as bank refuse. The boiler is vertical, and possesses a large heating surface of 250 feet. The engine also is vertical, bolted to a frame standing on one side of the shaft mouth, where it works direct a drum fixed over the pit on another frame. On the opposite side of the shaft is the fly-wheel, and to this wheel is attached a brake, which securely grips it until the



GIRLS BATHING IN THE SURF, AT HAWAII.

Many thousand tons have already been sent thither at a very great expense, the work having been going on for years, and, that, too, by the slow process of ox teams. Now that the railroad is nearly completed, this immense labor will soon cease, as the cars will pass along by the foot of these large granite mountains.

The Flagstaff Smelting Works.

These furnaces have been in operation for nearly three years, being expressly built for the smelting of the Flagstaff ore, which has supplied them almost exclusively from the beginning. The main building is 60x80 with an engine house and several other small buildings for the convenience of the work. They are now lying still for want of fluxing ore and coal.

The Davenport Smelter

Is situated on the south side of the creek, opposite the Flagstaff Works, and is 40x70 feet, supplied with two furnaces, the most complete in the Territory, and when in running order, works to a charm. They are now lying idle for want of ore. This valuable piece of property belongs to the Davenport Mining Company, but intends to do custom work when not supplied with their own ore. They are now paying ten dollars per ton for the hauling of the ore from here to the smelter, two dollars per ton more than any other mine in the district. As soon as they get 500 tons the smelter will commence work, which will be in a few days.

The Railroad

Will be completed to Granite by the 1st of April, the cars now making regular trips to within half a mile of that point. Considerable anxiety is apparent about where the depot will be, the Granite people praying for a benefit, and land owners protesting loudly, one Jew going into spasms over the matter. The proprietors of the road are sensible, and keep mum, undoubtedly intending to start a new town.

Discovery of Gold.

Considerable prospecting has been made for

engine man at his post, which is at the side of the fly-wheel. To release the brake, the principle in use in the North of England has been adopted—the engine man, directly he takes his stand in the position assigned to him, working by his own weight the lever which disengages the brake. To stop the fly-wheel and to apply the brake, he has, therefore, only to remove his foot.

To the lever, by which the brake is applied to the fly-wheel, Mr. Tildesley has attached an iron bar, through which the draw chain runs, and so soon as the skip reaches the required height at the top of the shaft, the action of the bar locks the fly-wheel in the grip of the brake, and keeps the skip securely suspended at that point. Owing to the use of the open grate, the fire is understood to require renewal only once in about two or three hours. The whole of the apparatus presents a strong contrast to the noisy winding machinery generally adopted in South Staffordshire, and the absence of smoke, together with the apparent impossibility of colliers' lives being sacrificed by the negligence or the oversight of the engine man in working his engine too long whilst men are ascending, seem to us to give to the improvement the importance which, now the New Mines Act is about to be put into operation, should attract the notice of the colliery people of this district. — *London Mining Journal*.

RICH DISCOVERY OF BORAX.—An immense deposit of borax has been discovered in the eastern part of Kern county in the neighborhood of Desert Springs. The borax lies in a stratum of about three feet in thickness and but a few feet beneath the surface of the ground, and is in a perfectly pure state. The discovery was made several weeks ago but has been kept a secret. It has, however, leaked out, and considerable excitement prevails among the Tehachepi people over the great borax mine. Claims are being located and mineral land entered rapidly. — *Southern Californian*.

Another Yellowstone gold excitement is being raised in Montana.

Clarence King's Survey of the Territories.

One of the latest acts of the Forty-second Congress was the appropriation of \$75,000 to continue and reorganize the United States Geological Survey of the Territories under the control of the Department of the Interior. In order to ascertain the character of the change and the nature and amount of work to be done during the coming season, a reporter of the New York *Tribune* called on James T. Gardner, chief geographer of the survey, who is at present in the city, and obtained from him the following facts:

The exploring expedition is to be known as the "U. S. Geological and Geographical Survey of the Territories under the Department of the Interior," and it is proposed to map out the topography and geology of the Rocky Mountain region and the country west of it; to investigate their resources, and distribute the knowledge obtained by means of maps, photographs, and illustrated reports. The work this year will be in Colorado. During last year the Yellowstone park region and the country to the south of it were partially examined with reference to the geological features. Further examination of this region has been postponed because of the difficulty of access to it on account of the hostile Indians infesting it, and because of the trouble and expense attending transportation thither, until the completion of the Northern Pacific Railroad. The scientific corps of the expedition comprises about twenty men, consisting of the chief geologist and his staff, the chief geographer and staff, and the natural history department. The chief geologist, who is also the chief of the survey, is Dr. F. V. Hayden, who has been exploring the country embraced in the survey for about twenty years, sometimes at his own expense, sometimes partly aided by the Government, and, during some periods, solely by Government appropriations. In 1871, the definite mapping out of the geological and natural history features of this far-western region began. The results are comprised in a series of annual reports made to Congress, and in the distribution of the collections of geological, botanical, mineralogical, and natural history specimens, by means of the Smithsonian Institute, to the various educational institutions in the United States. By the recent act of Congress, the investigation of the geographical features of the country is to be added to the work formerly done. Moreover, by the plan as now determined on, it is intended to carry on a connected exploration of the country, instead of, as formerly, a series of disconnected surveys of particular localities.

The principal objects of the scheme are, first, the obtaining of an accurate topographical map of the country; second, the careful mapping of its geology, and, third, the investigation of the connection of these with our mineral and agricultural resources. One gentleman of the party devotes himself almost exclusively to investigating the agricultural resources of the regions surveyed, noting the kind of soil, the meteorological conditions, the existence and prevalence of destructive insects, etc. By means of the Clarence King exploring expedition the Arizona diamond fields fraud was exposed. The story, as told by Dr. Gardner, is an interesting one. The finding of the place which was kept a secret by the originators of the scheme, depended upon the geographical, while the discovery of its fraudulent character was due to the geological knowledge of the region obtained by the survey. Another point in favor of expeditions like these is the following: The coal of the country occurs in a very different kind of rock than the Pennsylvania coal, and it is of the utmost importance to have the coal beds mapped out. It is proposed to start the expedition as soon as the weather will permit. The general plan of the expedition will be to continue its work of exploration and the collection of specimens for five or six months, and to arrange and classify the specimens obtained; to prepare maps of the region traveled over, and to make out the reports during the remainder of the year. The headquarters of the survey are at Washington where there is a building devoted to its purposes. About 15,000 copies of the reports are distributed annually throughout the country by members of Congress, and many photographs of scenery and natural objects are sent to institutions of learning in the United States.

The *Eureka Sentinel* says that the prospect now is that all the furnaces which stopped about the time of the epizootic will be running in less than a fortnight, and, in addition, the Buttercup works are expected to be started soon.

Useful Information.

Transition Signs.

This style of sign is not very common, but it makes a very neat and showy advertisement for all branches of business, it made in good style. The way to make them is, first get the sign board made the dimensions required, with a projecting band or moulding around it, say about one and a half inches deep from the face of the board to the outside edge of the band or moulding; then cut into the band or moulding around the board, from the top to the bottom edges, grooves the width of a hand-saw, one inch apart; then insert strips of tin one inch wide, and long enough to reach from the top to the bottom of the sign board, including the band; thus covering the face of the board. When all are neatly fitted, take them all out, laying them down flat, with the edges close together, and paint on them any work, figure, or design required. Let them remain until perfectly dry, then turn them all over, keeping them in the same order as before, turning them over from right to left. Paint the surface of the board with any letters, picture, or design required. Then paint on the strips of tin, on the reverse side from that previously painted, still another word, or design, and when dry, slide the strips of tin in the same order in which they lay, into the grooves on the sign. The sign is now completed, and has a very magical effect to those passing by, changing from one word or design to another, and makes the very best, cheapest, and most attractive sign that can be got up. It is not expensive, and only requires a little ingenuity to construct one.—*Cabinet Maker.*

A CHEAP PAINT.—We have not much faith in any of the so-called cheap paints recommended for outbuildings. Common whitewash with yellow ochre, or some other mineral substance for giving the required color, may in some instances prevent the decay of wood, and add something to the appearance of the buildings upon which it is used; but white lead and linseed-oil make the cheapest and best paint in the end, although costing a little more at the beginning.

But as a subscriber asks for a recipe for making a cheap paint for outbuildings, we comply with his request by giving one that has considerable popularity among gardeners:

Palverize charcoal in any quantity desired, add a little litharge to a drier, mix with raw linseed-oil, add a little boiled oil when applied. This will make a black paint, but by adding yellow ochre, a peculiar shade of green may be produced. Other mineral substances may be added if desirable.

TESTING GOLD USED IN GILNETS.—P. Gayot proposes for this purpose the use of a solution of chloride of gold or a solution of nitrate of silver. Neither affects at all the genuine gilding, but imitations, when touched with the former solution, show a brown spot, and with the latter, a gray spot. The gilt designs of wall papers are examined by Gayot with chloride of sulphur. One drop of this salt, placed on imitation gold paper, produces a dark brown rim, which does not appear when gold has been used. Thin gold leaves, if placed with chloride of sulphur in closed bottles and well shaken, show no change, but alloys of base metals gradually blacken. If the gold is placed in hermetically closed bottles under a slight aërostatic pressure, it will disappear in a short time and combine with the chlorine to form chloride of gold.

AN UNPLEASANT SUGGESTION.—A POSSIBLE CALAMITY.—The New York World asks: In case of a fire stretching suddenly across Manhattan Island, and then sweeping rapidly toward the Battery, what would become of the people south of where the conflagration originated? Where would they go? How would they get away? Could a sufficient number of steam-boats approach near enough to such a fire to rescue them all? If not, the tragedy of the Fifth Avenue Hotel, fearful as it was, would be but a feeble illustration of a spectacle which the most distant parts of the civilized world would not cease for centuries to remember with horror.

A ROCK CRYSTAL WATCH.—One of the curiosities of the Vienna Exhibition will be a watch made entirely of rock crystal. Many years since, a workman in a French manufactory decided to make a watch, every part of which, the mainspring alone excepted, should be of rock crystal, and after thirty years labor accomplished his task. All the pieces of the watch are fastened by rock crystal screws, and the escapement is most intricate. His widow would never part with it; but when she died, the treasure fell into the hands of a French watchmaker, who intends to exhibit it as a sample of French workmanship, pricing it at \$2,000.

TO DELAY THE "SETTING" OF PLASTER OF PARIS.—In many cases the rapid consolidation of plaster of Paris is a serious inconvenience, but it is said in a French journal that this difficulty in its employment may be remedied by the addition of from two to four per cent. of the root of marsh mallow, finely powdered. With this treatment the plaster, it is stated, will not set for an hour at least.

CARPET MANUFACTURE IN PHILADELPHIA.—The carpet interest in Philadelphia has reached enormous proportions, and is still rapidly increasing. There are about 250 manufactories, which employ, on an average, about 50 operatives each. The number of looms is estimated at 8,000, from which 800,000 yards of ingrain, damask, Venetian, two and three-ply carpets are turned out weekly. The number of yards manufactured annually has averaged 41,600,000. The amount of capital invested is \$3,000,000. The carpets made here have gained the widest and highest celebrity for fine, wearable texture and handsome designs.

A HAPPY THOUGHT.—Willis Williams, of Islesboro, Me., was recently out on the ice hunting seals, when an accidental discharge of his fowling piece wounded him so badly in the thigh that he could not walk. He smeared the dog's face with blood and told him to go home, which the sagacious animal did, and by signs and the blood alarmed the family, who followed him to the place where the young man was lying. The hint may be worth remembering by our friends of the Nimrod persuasion.

MAKING PAPER STICK TO WHITEWASHED WALLS.—Making a sizing of common glue and water, of the consistency of linseed oil, and apply with whitewash or other brush to the wall, taking care to go over every part, and especially top and bottom. Apply the paper in the ordinary way.

STANFORD ECLIPSE.—It is estimated that nearly one-third of the railroads of the United States are under the control of a few individuals in one corporation, called the Pennsylvania Railroad Company, of which Thomas Scott is king.

Good Health.

Hints in Regard to the Eye.

The sculptor Crawford was accustomed all his life time to read lying down. To this, very largely, the physician attributes the loss of his eye. Very soon a cancer formed in the other, which caused his death.

The great historian Prescott lost his eyesight when a student by a bit of bread thrown in sport by a fellow-student at the table. A pair of scissors or a fork thrown in sport or anger, has caused the loss of an eye, which the wealth of the world can not replace. A friend who was very ambitious to finish a set of linen for her brothers, spent almost a winter in the stitching, sitting up often late at night over the work, in which she took great delight. The result was, the nerve of the eye was so injured that she was obliged wholly to give up sewing, knitting and reading, under penalty of becoming perfectly blind.

A young lady, who lived but ten miles by train from school, used to spend the time in studying a certain lesson while she was riding down in the morning. The result was a severe inflammation of the eyes, which disabled her from study for a long time. It is always harmful to the eyes to read in the train, though we may not see the effect so plainly when it happens only occasionally. A steady practice like this, young ladies, may produce even worse results when the system is in a bad state.

Never read by twilight, nor before eating in the morning. This little you gain in time will be doubly lost before life's sundown.

I know a young clergyman who is a remarkably well-bred man, but whose eyes are a perfect deformity. He said he ruined them by reading at night, long and intently, when he was getting his education. He seems to have no control of the lids, which twitch and move in a most grotesque manner. Don't fancy you can do what you please with your eyes, and yet have them serve you faithfully. Take good care of them as you would of gold, for gold can never replace lost eyesight.

A Remedy for Croup.

We have been interested in reading the following statement made to us by an intelligent mother. We give our readers the benefit of it, or at least give them the opportunity to test whether it has any benefit.

A remedy for croup was given me by a sister who heard it from Prof. Brownson, a physiological lecturer since deceased.

"Let a healthy person fill his lungs with pure air, then slowly breathe upon the patient's throat and chest, commencing at the point of the chin, and moving slowly down to the bottom of the wind-pipe. Repeat for a few minutes and it will give relief in cases when all other means fail."

My boy was always subject to croup; came near dying with the rattling noisy kind, at about eleven months old. I saved him with water and ever after prevented a serious attack by watchfulness and water. But when three years old, I let him play in the brook one warm rainy day, and he took a severe cold and had a bad kind of croup, the first and last time he ever had it. In spite of all I could do he grew constantly worse until he could only gasp and breathe with his head thrown back. We thought his last moments had come, when I thought of, and tried Brownson's remedy for a minute. When I stopped he looked up and said: "Do so again, mother, do," though he could not speak when I began. You may be assured that I did so again, and I believe it saved his life.—*Lance of Life.*

A NEW AND DANGEROUS POISON.—A Baltimore physician says that the new medicinal compound, known as "xylo," is now being largely used in that city as a means to facilitate robbery and murder. He says that a person may be rendered powerless by its use so that the burglar can go through the house and take all he wants. If necessity require it, the burglar can xylo his victim out of this world into the spirit land in an incredibly short space of time. The mode of application is by mixing it with the feathers in a pillow, and when the warmth of the head is applied to it, it gives off vapors similar in effect to the fumes of charcoal, and the person using it is found dead in the morning, which gives the monsters who apply the drug ample opportunity to possess themselves of the property of their victims, and to dispose of their remains.

He says the drug was tried upon himself some time ago by a German Jew, who invited him to sleep in his house. He escaped his foul designs, by obtaining knowledge of his intentions and manner of proceeding, by trifling circumstances, the details of which are not given. He thinks that many of the late cases of "mysterious disappearance" may reasonably be attributable to the cause.

FAT AND LEAN.—Meat eaters and vegetarians show in their persons the effects of the diet. The first has the most brain force and nervous energy. A mixed food of animal and vegetable rations develops the highest intellectual powers. A strictly vegetable living ordinarily gives a fair complexion, and amiability and extreme pugnacity when the vegetarian's views in regard to that one engrossing thought of his life are discussed. They are annual meeting reformers, without ever setting the river on fire. Arabs are a sober, frugal race, rather slender, not tall, conscientious and contentious on religious subjects. They largely subsist on rice, pulse, milk and kei-uac, something similar to whipped cream, through a vast region of an arid country where they are indigenous. They are not destitute of mutton, goats, camels and game; but they manifest no disposition to feed upon meats, as is necessary in temperate zones or in high northern latitudes. An intellectual man, one of their kindred, who rises to distinction by the grandness of his mental status, is exceedingly rare. The beer and ale drinkers expand and grow fat, but they are not much given to profound researches in science.

ARRANGEMENT OF HOUSES.—Much in the way of good health depends on the proper arrangement of our houses.—The American Builder says: "Do not arrange your house so as to violate God's first command. Give it many windows, and then, O housewife, keep your blinds open during the day and your curtains drawn aside. If you let the sun in freely, it may fade your carpets, but if you do not it will be sure to cause ill health to the mother and children. The sun is a good physician. He has never had due credit for his curative qualities—for the bright eyes and rosy cheeks that come from his healing bath. Do you know how puny is the growth of a potato vine along the darkened cellar wall? Such is the health of human beings living where the sun is intercepted by the window's drapery. So dark wall-paper is not only gloomy, but it is physically unwholesome. Let in the sun, for with it comes cheerfulness and strength! A dark room is an enemy of good health, good temper and good morals."

IS INEBRIETY ON THE INCREASE?—In a late number of the *Contemporary Review*, Herbert Spencer combats the idea that inebriety is on the increase. He describes the time when men took drugs to increase their desire for wine; when glasses were so shaped that they had to be held until emptied; when a man was reckoned as a "two-bottle man," a "three-bottle man," etc.; and when (Mr. Spencer might have added) one of the first of Scottish nobles employed a domestic whose sole duty it was to sit under the table and loosen the neck-cloths of the guests as they fell from their chairs, in order that they might not suffocate in their drunken sleep. Intoxication used to be a mark of honor. It is now a disgrace. Education has driven the evil from one class after another. It is now almost exclusively confined to the lowest. As Mr. Spencer says, the remedy for it in England is not a "Maine-law," but the introduction of the education that has banished it elsewhere.

BETTER THAN MEDICINE.—Dr. Hall says the best medicine in the world, more efficient in the cure of disease than all the potencies of the materia medica, are warmth, rest, cleanliness and pure air. Some persons make it a virtue to brave disease, "to keep up" as long as they can move a foot or crook a finger, and it sometimes succeeds; but in others, the powers of life are thereby so completely exhausted that the system has lost ability to recuperate, and typhoid fever sets in and carries the patient to a premature grave. Whenever walking, or work is an effort, a warm bed and cool room are the very first indispensables to a sure and speedy recovery. Instinct leads all beasts and birds to quittance and rest the very moment disease or wounds assail the system.

TOBACCO-SMOKING.—A German physiologist has discovered that tobacco-smoking by the boys "interferes with the molecular changes coincident with the development of tissues, and makes the blood corpuscles oval and irregular at the edge." Any parent can thus ascertain if his boy smokes by merely taking out a handful of his blood corpuscles and observing their edges.

MISCELLANEOUS.

German Prejudice Against Potatoes.

There exists in Germany a decided prejudice against potatoes, because they are composed of three-fourths water, with but ten to fifteen per cent. starch contained in indigestible cells. The French, who make a perfect science of the whole business of nourishment and cookery, rarely eat potatoes except occasionally tried for the second breakfast. They consume beans more than any other vegetables and with reason, for dried beans contain twenty-two per cent. albumen and fifty of starch, and the common lentile twenty-six per cent. of albumen and fifty-six of starch. In the monasteries of France and Italy great quantities of beans are used, especially during the Lenten season. German naturalists are now searching all over the world for a substitute for potatoes, and this is believed to have been found in China in the "dioscorea japonica," which endures the greatest cold and is more nourishing and better flavored than the potato. In the Museum of Natural History at Paris, a specimen three feet long and weighing three pounds was exhibited.

Several German writers upon races, predict that nations, far from improving, will deteriorate both in physical and mental characteristics, if potatoes become a principal article of diet. The celebrated Carl Voigt says "that the nourishing potato does not restore the wasted tissues, but makes our proletariats physically and mentally weak!" The Holland physiologist Mulder gives the same judgment, when he declares "that the excessive use of potatoes among the poorer classes, and coffee and tea by the higher ranks, is the cause of the indolence of nations." Leidenfrost maintains that the revolutions of the last three centuries have been caused by the changed nourishment. In former days, the lowest workmen ate more flesh than now, when the cheap potato forms his principal subsistence, but gives him no muscular or nervous strength.

Roast Turkey.

Select a fine, plump, yellow skinned turkey, weighing from ten to twelve pounds. Examine it thoroughly to see that all the pin feathers are taken out; hold it over a blaze to singe any fine hairs that may remain; wash it thoroughly inside and out, and rub it over with salt. Take the gizzard, heart, and liver, put them in cold water, and let them boil until tender. When done, chop them very fine. Take stale bread, or the large Boston crackers, and grate or chop them. Add salt, pepper, and some sweet herb if liked, to the bread crumbs; after which beat two eggs with which to moisten the crumbs; add and mix thoroughly with this the chopped "inward," not forgetting to put in salt and butter. Fill the inside of the turkey with the dressing, taking care that the neck or crop is made to look plump, and sew the openings, drawing the sides tightly together. Then rub a little butter over your turkey, and lay it upon the grate of your pan. Cover the bottom of the pan with boiling water. After a half hour have the turkey by pouring over it the gravy that has begun to form in the pan. Repeat the basting once in about fifteen minutes. In an oven of average temperature a twelve-pound turkey will require at least three hours; but every oven has its own way of baking, and the cook must be governed by it.

Roast goose is to be prepared in the same manner as the turkey. The dressing should be made of mashed potatoes, seasoned with salt, pepper and sage, or onions, if according to the taste of the family. Make giblet sauce by boiling the "inwards" until very tender, chopping them fine, and adding them to a gravy made by using the liquor in which they were boiled thickened with flour, and to which has been added one ounce of butter, and pepper and salt to suit the taste.

DANGEROUS DIETS.—The frequent failure of the potato crop in England and Ireland is likely to bring about an epidemic of scurvy, unless the public can be better informed of the requirements of an antiscorbutic diet. The fact therefore, cannot be too widely made known, in fact, whether we are suffering under the failure of this important crop or not, that peas, pudding, haricot beans and boiled rice, which have been suggested as substitutes for potatoes, will not prevent the occurrence of scurvy. In the absence of the potato, an excellent antiscorbutic, fresh green vegetables or fruits will be requisite, or the health will fail, even though fresh meat be taken. Amongst the vegetable material which may be used, are the various forms of cabbage, lettuce, oranges, lemons, onions, mustard, cress, dandelion and sorrel. The experience of the crews of vessels on long voyages has shown, over and over again, the uselessness of the pea and bean tribe in preventing scurvy.

TO MAKE POP CORN BALLS.—While popping your corn put some syrup on the stove, the nicer the better, and boil it down quite thick. Put your corn while hot in a dish pan, or any large vessel convenient, pour the syrup over it and stir it well with a spoon. It only needs enough to make the corn stick together. Butter your fingers and make up the balls quickly any size you wish. Lay on a plate until cool, and they are nice.



W. S. EWER..... SENIOR EDITOR

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San Francisco:

Saturday Morning, April 12, 1873.

Legal Tender Rates.—S. F., Thurs., April 10—buying 86; selling 87.

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Quicksilver.

In north-western Guatemala there is an intermittent spring of quicksilver. The stream is about the size of a quill; not always uniform. The cause of the flow is no doubt volcanic heat. An active volcano is in sight and hot water springs abound. A dense chapparal shuts out access to animals; but native men and women fill cane stocks with mercury, and thus carry it to the city of Guatemala.

That fine country is now being opened to commerce by railways, and soon we may expect large supplies from that State.

The last news from Sinaloa, Mexico, announces a shower of mercury covering several fields and people were represented as gathering the fluid metal, to preserve as memorials, and some find it in quantity enough to speak of the profits of the quicksilver crop.

THE NEW REVENUE CUTTER.—The new Revenue Cutter Oliver Wolcott was launched on Thursday morning last from North's Ways on the Portrero. She was built by Dickey Bros. after a model of their own design, under the supervision of Captain White, of the Revenue Service. She is 270 tons register, 130 feet over all in length, 22 feet beam, and 9 feet 2 inches in the hold, and has a 300-horse power engine, which was built at the Bidson Iron Works. We shall have a more extended description of this California built steamer when her trial trip is made.

THE STEEKEN RIVER. A party of French miners has been organized in this city to proceed to Steeken River country (British Columbia), for the purpose of working the immensely rich mines reported to have been discovered there.

Borax—How It is Obtained.

Boracic acid is by no means very profusely distributed over the earth's surface, and borate of lime in particular, has until lately only been found near the celebrated nitrate of soda deposits of Iquiqui in South America. Recently, however, large masses of borate of lime have been discovered in Churchill, Esmeralda and other counties in Nevada. The mineral found in Nevada is the same as that found in South America. It is not true borate of lime but a combination of borate of soda and borate of lime. A recent analysis of this substance by F. Gutzkow gave in round numbers

Boracic Acid.....42
Soda.....8
Lime.....13
Water.....37
Total.....100

There appears to be some difference in the impurities found with it. In Nevada this appears to be principally clay, while in South America, gypsum is always more or less found intermixed with it. Owing to these impurities some difficulty has been experienced in working the mineral in England and France. The expectation that South American borate of lime would be a prolific source of borax has failed, from the circumstance that the shipments from Iquiqui turned out to be of a very unequal nature as to quality, which with the difficulty of ascertaining the true proportion of boracic acid by an easy assay, has rather demoralized the market for the substance in question.

The Process Now Used for Obtaining it

In this country consists of a concentrating operation in which, by an enormous loss in substance, the borate of lime is freed from its impurities. Then it is hoiled with a solution of carbonate of soda and the solutions obtained worked for a crude borax to be refined afterwards by re-crystallization. This process has several important drawbacks. In the first place the high price of soda on this Coast interferes seriously with the operation. Although the State of Nevada possesses large deposits of crude soda, the high rates of transportation enhance its value to such a degree that it is almost as advantageous to employ the English sal-soda, which is, moreover, a much purer article. Furthermore, the decomposition of borate of lime is not complete with the use of soda, and the residue will always contain some undecomposed mineral, unless a very large quantity of water is used. As the borate of lime is not insoluble in water, it is possible to extract, by water alone, all traces of the mineral; but on a large scale this is, of course, not possible. In the third place the clay mixed with the mineral and the carbonate of lime formed by the soda makes the residue extremely bulky. It takes considerable time to make it settle into a pulp of some reasonable thickness. Therefore several washings are required to wash out the absorbed borax solution; thus yielding weak solutions which have to be worked up, and concentrated.

Some New Experiments in Freeing Borax from its Natural Impurities.

Lately Mr. F. Gutzkow of this city turned his attention to the subject and invented a process, which he has had patented and which depends upon the volatilization of boracic acid by water vapors, a principle which Nature itself proves correct by furnishing in that way, all the boracic acid manufactured in Tucumán. At the last meeting of the California Academy of Sciences Mr. Gutzkow described his process in a small way, with appropriate apparatus, and demonstrated the feasibility of his plan. He has discovered that volatilization can be made complete, that is, that a given quantity of boracic acid can be completely volatilized by steam alone.

The plainest experiment, and that which laid the foundation of his process is this: To melt, in a platinum crucible, some boracic acid into a glaze; weigh the crucible with contents, and then conduct steam by a brass tube into the crucible, while the latter is heated to redness. By weighing from time to time, the progress of the volatilization may be observed. After continuing the experiment for two hours—more or less—the crucible will be found entirely empty. By other experiments, in which he suspended a weighed platinum wire on which was a head of boracic acid, in an iron gas pipe, steam of different temperatures being conducted through that apparatus, he showed that the rapidity of the volatilization depended entirely upon the temperature of the steam. Steam of 212° F. is not capable of removing more than

traces, unless the reaction is allowed to continue for a long time. If the gas pipe surrounding the boracic acid head is, however, heated to redness the volatilization is most rapid.

The rather surprising fact that steam of 212° F. has so little power for the purpose required, caused Mr. Gutzkow to experiment on some statements of Henry Rose, the celebrated chemist, to whom we are mostly indebted for our knowledge of the element boron and its combinations. Rose states that it is not possible to concentrate a solution containing free borax without loss of substance. This was found correct when the solution is evaporated in an open dish; but not so when the concentration takes place in a glass flask. On concentrating an already quite concentrated solution of boracic acid in a glass flask over a moderate fire, Mr. Gutzkow could never condense more boracic acid than the mechanical carrying off by the vapor would account for;—that is, a trace.

In an open dish, however, in the progress of concentration, a ring of boracic acid separates on the dish, which boracic acid is heated more than the solution, and is exposed to the action of the steam rising from the liquid. In that case a volatilization takes place.

Having found out that superheated steam is much more powerful in carrying off boracic acid than steam of 212° F., it was easy to conclude that the condensation of the volatilized boracic acid could not present great difficulties. The boracic acid volatilized in the apparatus spoken of before—that is, in a heated iron pipe—was found condensed in the colder portion of the pipe. By regulating the length and temperature of the pipe the fact presented itself that the steam can be deprived almost entirely of its percentage of boracic acid. With these facts in his mind the reader can easily understand

Mr. Gutzkow's Process.

Which is as follows: The borax of lime can be used as formed in the borax marshes, or more or less prepared, as is done when it has to be transported for any distance. It is placed in a lead-lined, shallow pan, covered with half the weight of water, and allowed to stand for a day or longer, in order to allow lumps to dissolve. Then, from one-quarter to one-half the weight of sulphuric acid is added, and the whole well stirred into a stiff pulp, which is taken out and thrown into a heap. After some days the mass becomes hard, as the gypsum formed commences to set. The mass is then ready for distilling with steam. This is done in an iron retort with an arrangement for heating it. A gas pipe, 12 feet by 1½ feet will answer all purposes. It should stand in an upright position, in order to facilitate the charging and discharging, and also to cause an equal action of the steam. When the pipe is sufficiently heated so that no condensation of steam will take place, steam is admitted. It becomes superheated within the retort, and carries along the boracic acid, leaving a porous mass of gypsum, etc., which, when the operation is continued sufficiently long, will be found entirely free from boracic acid. It has been before mentioned that the rapidity of the operation depends upon the heat employed. If the temperature of the retort is nearly to a red heat, from one to two hours will suffice to finish the operation in the lower part of the retort. If the temperature of the retort is only, say 400° F., which is very easily reached within the retort, about four hours will be required.

The details of the apparatus which allows a continuous working and by withdrawing only half the contents every four hours allows the mass to be exposed twice as long to the action of the steam, we will omit and merely describe the process.

The steam which leaves the retort is highly charged with boracic acid. It can be made to absorb not less than the fourth part of its weight of the hydrated boracic acid. From the retort it passes into a brick or lead-lined wooden chamber where most of the hydrate boracic acid will be deposited. Then it passes through another chamber, or better, a long fine provided with metallic gratings, before it escapes into the atmosphere. A worm condenser can be used and a strong solution of boracic acid will result. It may also pass through a coil of lead or other metal which permits the utilization of the waste heat. There are numerous devices to remove, by partially condensing, the last traces of boracic acid, if desired.

Most of the boracic acid is, however, found in the first chamber as hydrate boracic acid and can from time to time be removed. It can easily be melted in a glaze, taking care to condense the boracic acid, during melting, and is absolutely pure. In the state as found in the chamber it may contain a little sulphuric acid but by the admixture of some coke or charcoal with the top layer in the retort, the sulphuric acid may be easily converted into sulphuric acid gas which escapes uncondensed from the chamber. There is no substance present to interfere with the purity of the product obtained. In a mechanical way nothing can go over as the mass within the retort becomes all glazed over by boracic acid.

The Advantages Claimed for the Process

Are, that with very little labor, in one single and short operation the mineral can be extracted. There are no rich residues left to be worked over, nor liquors to be concentrated, which makes the lixiviating process so complicated. Besides, the boracic acid, and particularly the boracic acid glass, can bear the high cost of transportation from the borax marshes to the market much better than the borax or borate of lime. To bring one pound of borax

from the marshes to the market, that is, in New York or European ports, costs now from six to seven cents. To transport the molten boracic acid which gives three pounds of borax nearly to the pound, would reduce the cost of one pound of borax by two thirds. Mr. Gutzkow's explanation of his process was very interesting. We understand that works to be conducted on this plan will shortly be erected in Nevada, when we will be able to give some details of practical operations.

The Gold Note Banking System.

The necessity of having some medium besides gold, wherewith to facilitate business, has been recognized by the business world, so long, that it is almost unnecessary to expatiate on it. The increase in the production of the precious metals never has kept pace with the increase in the volume of business, and never will. But money of some kind or other is as necessary to the conducting of business operations as is natural or artificial irrigation to the production of crops, or as is a full and healthful flow of blood through its accustomed channels to the vivifying of the human body. Now, the contraction of the volume of specie by export, or its inadequacy to the wants of an increasing business, must result in great calamities to the whole of the business community. The natural results are the cheapening of all commodities, and were this through any cause to occur suddenly, it would be found most disastrous to the business community.

The value of the merchant's stock in California would be depreciated in proportion to the rise in gold, while his liabilities, remaining the same in nominal amount, would be really increased as much as his stock was depreciated. To illustrate: let gold universally rise 25 per cent., with a volume of business increased proportionately, and let this advance be continued for a year without there being any expansion in the way of currency or other paper money.

Then the stock a merchant purchased previously for \$100,000, would in accord with the inexorable laws of supply and demand, have to be sold for \$75,000, while it would cost him \$125,000 to purchase gold to pay his creditor. That would be a loss of \$50,000 or 50 per cent. The gold note system is the only one capable of supplying a deficiency of the circulating medium, where as in California, currency is not a legal tender. Without it money would now be even tighter in this State than it is. We shall on a future occasion point out the difference between the gold note and the currency system, now contenting ourselves with giving a resume of February's statements, by both our gold-note banks, the resources of the

First National Gold Bank

Of San Francisco on the 28th day of February, 1873, was \$2,574,056.25, of which \$1,257,220.67 consisted of loans and discounts, \$800,000 of U. S. bonds and \$451,573.03 of coin and gold checks on other banks. Its capital stock was \$1,500,000, and National Bank circulation outstanding \$528,720. The resources of the

National Gold Bank and Trust Company

Of San Francisco, on the same date, were \$3,599,961.77, of which \$1,955,704.59 consisted of loans and discounts, \$750,000 of U. S. bonds, and \$351,794.46 of coin. Its capital stock was \$1,000,000, and its National Bank circulation outstanding \$595,620.

DAMASCUS BLADES. — It has long been a matter of comment among unscientific persons that steel made by the rudest processes and under the greatest disadvantages, apparently, should yet be so highly estimated. So much has been said in books of travel and works of fiction (appropriately classed together, by the way), about the superiority of "Damascus blades," "Malay cresces," "Toledo rapiers" and the like, that it is not to be wondered at that an exaggerated impression is the result. None of these kinds of steel compare at all favorably with fine grades of Sheffield manufacture. Their good qualities, in every case, are owing to the purity of the ores and fuel employed—usually perfectly pure magnesian and charcoal. In days gone by they led all rivals, now, with our perfected refining processes and improved machinery, we wonder that our ancestors found so much to admire in these far-famed brands. We cannot afford to use charcoal made from rare woods nor is it found practicable to waste so much labor on so small produce; but from common pig metal the keenest steel for surgical instruments is made, and that too in almost unlimited quantity. The world does move.

Underground Irrigation.

This is a subject every day commanding more and more the attention of amateur culturists as well as the general farmer. It is a means by which our gardens can be efficiently irrigated and made to present a perpetual and unvarying growth of plants, vegetables and fruits, and our lawns and parks a perpetual green, and this without the unsightly and inconvenient process of surface irrigation, with its malarious influences.

In our illustration we present a view of a new invention and its application to the purposes of underground irrigation. It consists of pipes of peculiar construction and their arrangement in such manner as to secure the purposes claimed and desired. The inventor in his description of his appliances, and in his application for a patent, says:

"This is an invention for the conduct of water underground long distances without waste, for the purpose of irrigating the soil to promote the growth of plants, trees and growing crops.

The lower part of the pipe being whole or tight, no water can escape until the pipes are half full, if laid level. The pressure of the water being equal it will issue from the cuts or holes in the upper half in equal quantity at all points. The large box, No. 1, is the supply receiver, to be placed under a pump or hydrant, receiving the conducting pipe at A, which conducts the water in any direction in a straight line; where the direction is to be changed the pipe enters a small box-well, No. 2, which receives similar pipe running in other directions. If the ground is inclining and we wish to extend our pipes, and at the same time retain the same depth in the ground, we are forced to change our level. This is accomplished as represented by box-well No. 3. The pipes enter this on the same level, letting the water out on the other side into pipes on a lower level.

The water in the pipes is controlled and directed by means of valves covering the ends of the pipes in the wells, No. 2, 3 and 4.

No. 4 represents a box-well for conducting water from the upper terrace to a lower terrace on terraced grounds. The pipe enters at O, on the upper terrace, letting the water into the pipes laid on the terrace below, at B, controlled by valves, reached by opening door, F. The wells are made deeper than the pipes, to receive and hold any sediment contained in the water, and which may be removed when necessary.

These pipes will also answer the purpose of drainage, draining the soil above the level of the pipes of any excess of water during the winter season. By simply removing the plugs in the ends of the pipes we reverse this operation and they become drainage pipes. As the pipes become exhausted, water will enter them at the points where it is forced out by pressure in irrigation, and as it flows out at the ends it can be conducted into drains or sewers. This operation will leave the soil above the level of the pipes in a fine condition for the rapid and healthy growth of plants. The pressure of the water in the wells coming from the supply pipe keeps the valves closed, they can be opened by the operator by means of a rod attached to them, carrying the whole volume of water in any direction."

VALUE OF HUMAN LABOR.—Some idea of the pecuniary value of human labor may be had by noticing the enhancement acquired by iron as it passes through the hands of its skillful manipulators. Crude pig metal at (say) 20 per lb. becomes worth \$500 per lb. in the form of the finest hair springs. The cheapest metal thus becomes far more valuable than gold, through the application of human skill. The one value is 25,000 times that of the other. This is a startling leap, but we can take in the truth better by following the metal through its different stages of refinement—refined pig, bar iron, terne plate, shear steel, penknife metal, razor steel and surgical instrument steel, etc.—and so accustom ourselves to the steady gain.

And then the tenuity of the thread on which the enormous value of the finest product depends! Suppose that, while this pound of metal more precious than gold was in the melted state, a careless workman should drop a match or a pinch of sulphur upon it. The mere addition of so minute a quantity of an injurious element would destroy at once the worth of the whole.

The Spectroscope and the Stars.

The fourth of the series of lectures on the spectroscopy, in course of delivery by Prof. Neri at the hall of St. Ignatius college, was listened to by a large and attentive audience, and illustrated by numerous beautiful and instructive experiments by means of diagrams projected on a screen by the electric light.

The previous lectures having fully explained the principles and powers of this new and wonderful instrument, the present one was devoted to a consideration of its application and results to solar chemistry.

What the Spectroscope Tells us of the Sun and Stars.

Heretofore man's only knowledge of the character of the heavenly bodies has been derived from falling meteors; but the testimony which they bring is very uncertain. But the spectroscopy, besides revealing an intimate knowledge of the character and composition of terrestrial substances, has also been found competent to reveal the character, elements and physical constitution of all heavenly bodies, which emit light sufficient to render them visible by means of any astronomical instrument. That there is no mistake about this—that the spectroscopy is no uncertain teacher—was distinctly shown by a series of interesting and thoroughly convincing experiments and demonstrations.

In addition to receiving and taking in the light of the sun, it also seizes upon the smallest ray of light, from the dimmest star, comet or nebula, and, by a peculiar arrangement of

bright, and the term "lines" in reference to those which are dark.

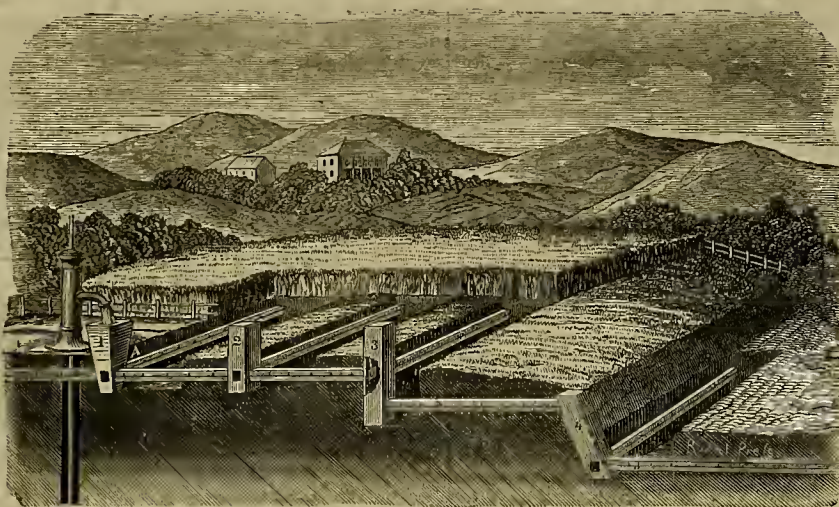
In examining the spectrum of the sun we see both dark lines and bright bands. Some 3,000 of the former, besides many of the latter are observed upon the solar spectrum; but we are not to infer from that fact that there are so large a number of different elements in the sun; for a single element often gives several bands or lines, as the case may be. For instance—iron gives some 600 lines, all of which are due to that single element.

The study of these lines and bands upon the various spectra is far from being completed. Many lines which at first were supposed to be single, by improved instruments are now found to be double, and often a large number of very small lines is found to make up what was once supposed to be one very broad line.

A Mystery.

When we examine metals or other elements in the laboratory, by means of the spectroscopy, we invariably obtain bright lines on the spectrum. Those lines always occupy a certain place, never varying their position. Thus by a series of experiments, the place on the spectrum for the lines of each of the different elements has been definitely fixed, no one ever interfering with or occupying the place of another. These facts were learned early in the history of the spectroscopy.

Subsequently, when Fraunhofer turned his spectroscopy to the sun, and began to examine the solar spectrum, he found a large number of dark lines. He at once commenced a study of those lines—what were they? Could they be the lines of earthly elements? No, for they were dark; while the lines of the earthly elements, as examined in the laboratory, were



AIKEN'S UNDERGROUND IRRIGATING APPARATUS.

prisms, disposes or spreads out that ray so as to bring it within ready examination, and separates its light into a spectrum of prismatic colors; and if that ray is from a highly heated vapor or an incandescent body giving out highly heated vapors, it projects upon that spectrum, as a background, certain dark or bright lines, or bands, as they are sometimes called, which lines determine the character and constitution of the body under examination,—one or more lines appearing in a certain position for every different element whose light is thrown upon the spectrum.

If the spectrum we obtain is a continuous one, merely spread out like the colors of the rainbow and without any bright or dark lines across it, we know that the body emitting the light is either an incandescent solid or liquid one, and not a body of incandescent vapor or even one giving off such vapor.

If bright lines appear across the spectrum we know that the body is composed of highly heated vapor, and that the lines (according to their places on the spectrum) represent some given element.

If instead of bright we have dark lines, we know that we are examining a body capable of absorbing certain rays of light, thus giving rise to what is called an absorption spectrum—the dark lines being simply shadows of the various elements which they represent.

The different characters of the spectra thus determine certain general characteristics of the bodies submitted to their test. The bright lines upon the spectra tell us, by their numbers, position, relative brightness and color, how many different substances or elements there are in a luminous body we are examining. By comparing these lines with the spectra which we obtain from earthly elements, we are able to name them as far as they correspond.

Of earthly elements found in the sun we have already discovered iron, titanium, calcium, magnesium, nickel, cobalt, chromium, barium, sodium, copper, zinc, hydrogen, in large quantities, aluminum, selenium, cesium, strontium, and probably iridium.

No indications have yet been found of gold, silver, mercury, platinum, lead or tin in the sun.

In speaking of the lines or bands upon the spectrum, the term "band" is generally employed, when reference is made to those which are

bright. Further examination, however, showed that many of these dark lines corresponded exactly with the bright lines of the metals. Still another mystery! How was this? Here was a mystery indeed. Was the spectroscopy, after all, to teach us only an uncertain lesson?

Scientists in continuing the studies of these lines, discovered that it was impossible to pass through an incandescent vapor of any substance, the rays of light which that substance is capable of emitting. If now we employ the spectroscopy to project the spectrum of sodium, on a screen, with the sodium flame or vapor intervening, we shall have a black band on the spectrum in the place of the bright sodium line, which the sodium flame alone would give—this black line being in reality a shadow cast by the incandescent sodium, in the white light which we are analysing, in consequence of its passage through the sodium vapors in the flame.

This discovery made by Fraunhofer proved one of the most important in connection with the history of this instrument—for continued and multiplied experiments in this direction finally led to a full explanation of the

Mystery of the Dark Lines on the Solar Spectrum

And proved that those dark lines represented elements corresponding to the bright lines observed in the laboratory. The lines of the different elements appeared dark, when coming from the sun, because its light had to pass through the incandescent vapors, of such elements, thus projecting a shadow instead of a bright line upon the spectrum. Thenceforward man has possessed an instrument as sure in its results of the analysis of the sun or any other heavenly body, as is the crucible or other instruments applied to ordinary analysis in the laboratory.

In illustration of the phenomena of absorption, whereby the dark lines are made to appear on the solar spectrum, the Professor gave some very interesting experiments showing the

Philosophy of Different Colors in Glass,

Or other media through which light can but imperfectly pass.

A red glass intercepted all but the red rays; a yellow all but the yellow rays, etc. This was proven by first throwing a spectrum of all the rays from a luminous substance upon the screen, and then throwing upon the screen only such rays from the same substance as would pass

through a red or yellow glass. In the latter case the spectrum of each transmitted light would show, strongly, only the light corresponding to the color of the glass, or other media, with a very small amount of some complementary color, the transmission of which was due simply to imperfections in the coloring matter of the glass. This experiment shows that colored glass does not color the rays of the sun, but merely stops all but the rays corresponding to the color of the glass employed.

This, like each of the previous lectures, was illustrated by numerous experiments and diagrams thrown upon the screen by means of the electric light, and added largely to the interest of what was said, by making almost everything perfectly comprehensible to the eye as well as the understanding. The necessary absence of such diagrams from our report will not admit of anything like justice being done to the subject or the lecture. Professor Neri is peculiarly happy in his manner of treating a scientific subject before a mixed audience; which fact, with the extensive philosophical apparatus, at his command, enables him to keep up the interest of his hearers, make everything clear and well understood and withal present a most enjoyable treat of what is usually, on such occasions, a dry and uninteresting detail of philosophical facts. The fifth and concluding lecture of the season will be given on Thursday evening, the 24th inst.

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s Scientific Press American and Foreign Patent Agency, the following are worthy of mention:

IMPROVEMENT IN CHIMNEYS.—J. Browell,

S. F., Cal. This invention relates to that class of chimneys or flues for houses, in which two pipes, an inner and an outer one, are used. Mr. Browell's improvements consist, first in the employment of earthenware pipes or tubes for the inner one instead of sheet iron, as heretofore constructed, and secondly in a novel arrangement of stay rods and supports for holding the chimney in its place, no matter how many joints or sections it is composed of. The patent covers a very nice arrangement for a chimney.

CHANNELING AND EDGING TOOL.—Louis

Bauer, S. F., Cal. Mr. Bauer patents a combined channeling and edging tool for leather workers, its object being to provide a tool which will at one operation trim the edge of a piece of leather and cut an angular channel in the leather near the edge, in which the stitches of a seam are bedded and protected.

PUMP.—Ira D. Cross, Petaluma, Cal.

In this pump one pipe full of water is made to balance another pipe full, so that no matter how high the water is to be raised, the two balancing pipes are carried up to the point

where the water is to be discharged. The two pipes are so arranged that by giving them an alternate motion up and down, they take in water at the bottom and discharge it at the top. Thus it will be seen that as the pipes balance each other the operator has to lift only the amount of water that is discharged at each stroke. The patent covers a peculiar construction of the cylinder, piston, piston-rod and inlet-pipe at the bottom of the well.

WATER WHEEL.—N. J. Coleman, Railroad

Flat, Cal. This invention relates to that class of water wheels which is peculiar to California, the "hurdy gurdy" wheel, and it consists in a novel arrangement of the buckets, whereby the water is made to exert its force upon the full length of the bucket, and by which the power is not lost by the centrifugal force caused by the high velocity of the wheel which in ordinary water-wheels reduces the power of the water to the result of its first impact upon the buckets.

PRINTERS' LEAD RACK.—O. A. Dearing, S.F.,

Cal. This invention will be appreciated by printers—job-printers, especially. It consists of a rack or case having graduated pigeon holes, in which the different lengths of printers' leads are kept separated. The rack is provided with a scale, which serves to aid the compositor in determining the length of each lead, in order that he may readily place it in its proper pigeon-hole. Mr. Dearing is the inventor of quite a number of devices for facilitating the work of compositors. He will have his reward.

CYLINDER WAGON.—George Coffee and William

M. Bernard, Dixon, Cal. This invention relates to a one-wheeled or unicycle wagon. The wagon is not intended for a pleasure vehicle, nor would it answer in a very satisfactory manner as a trotting sulky, but as a wagon suited for doing heavy farm work or as a road wagon it would seem to be quite convenient. It consists of a single broad wheel or drum having an axle (or shaft) passing through its center. The pole or tongue is attached to the opposite ends of this axle or shaft so that the pull upon it causes the drum to revolve. The bed is placed upon ways or slides inside of the drum so that as the drum revolves the bed will keep at the lowest part of the circular ways by sliding upon them. This wagon will also answer as a land roller and for various other farm purposes.

The Cerro Gordo Mines.

These mines, from their immense productive-ness and the great trade they have built up for Los Angeles, and which is now being diverted to this place, have become widely known and celebrated, while yet very little information of an authentic and definite character has been published in regard to them. Since travel and trade to and from them has begun to take this channel, and our business relations with them have commenced to assume an intimate character, we have been at some pains, by inquiry from well informed parties, to collect such facts as may afford to the people of this valley some idea of the extensive market and other sources of trade these mines will afford and which no other section of the State can compete for, unless under circumstances of great disadvantage.

The Mining Camp

Of Cerro Gordo is situated in the Inyo mountains, Inyo county, California, about eight miles east of the northern extremity of Owens' Lake. The Inyo mountains are parallel to the Sierra Nevada, from which they are separated by the long and wide depression occupied by Owens' Lake and the river and valley of the same name. The location, defined with precision according to the public surveys, is in Township 16, South Range 38 East of Mt. Diablo base and Meridian. The town contains somewhere between ten and twelve hundred inhabitants, is built in a depression of the mountains, about six thousand feet above the sea level, and the mines are mostly in and near it.

These Mines Were Discovered

Not long after the great Washoe excitement which led to extensive explorations of the eastern slope of the Sierras, but they were little worked until six or seven years ago. Their present state of development has not been affected by outside capital but has been done by the miners themselves with the produce of the mines. All the principal owners and men who are identified with them, like Belshaw, Beaudry and others, and the Swansea Company, have commenced with very limited means and their present wealth has been created from the proceeds of the mines. The importance of this mining locality can hardly be overestimated. There is no doubt that at this day there would have been as large a population collected about them and as much capital invested in their vicinity as there is at Virginia City and Gold Hill, had they had the same direct and easy means of communication with the coast. The only outlet for their bullion and channel for the receipt of supplies, was the circuitous and almost impassable route via Los Angeles. But this serious drawback is now being obviated by the advance of the S. P. R., and the opening of a wagon road from this place via Tehachapi pass, the advantage of which will be seen by a glance at the map. The mines, which are numerous and extensive, are of argentiferous galena, rich and easily worked. Wood is abundant, and water from the want of which great inconveniences suffered at present, may and soon will be supplied in ample quantity. There are some fine agricultural lands within a distance of ten or twelve miles, in the Owens' River Valley, and plenty of salt in Saline Valley, and other resources and advantages too numerous to mention.

The ores are chiefly a species of sulphides, galenites and antimonial galena, all rich in silver.

The Principal Lodes,

In the vicinity of Cerro Gordo are the "Santa Maria," the first mine worked in the district; the "Omega," owned by the Swansea Co., which furnishes nearly all the ore smelted in the furnace of that Company located near the lake, at the village of Swansea where a large share of the smelting is done; the "Carmen Lode," belonging to a number of practical miners, who work it themselves and sell the ore; the "Jefferson Lode," and the famous "Union Lode," belonging to Belshaw and Beaudry, which is extremely rich in silver, furnishing the ore for two furnaces that smelt at present two hundred and eighty bars daily, of eighty-five pounds each and worth seven hundred dollars per ton; the "San Felipe," the "Gen. Jackson," the "Temple," the "Tillie Castres," and many others.

About half a mile south of these lodes, nearly at the highest point of the Buena Vista mountains, are immense cappings of quartz that are conspicuously visible at a distance of from twelve to eighteen miles. In many places they are from twenty to thirty feet wide and rise up like walls to the height of from twenty-five to forty feet, and are traceable for miles in a southerly direction.

This lode, known as the "Boushey Lode" and the "Gem of the Desert," was located a short time ago by Stephen Boushey, and a tunnel commenced in a thorough and workman-like manner, designed to intersect it at a depth of two hundred and fifty feet. It is believed by many that this lode may prove the most valuable and extensive in the district. Most of the lodes heretofore mentioned converge toward it and inspire the reasonable confidence that it may prove the mother lode of the district, of which the others are mere spurs or offshoots. The number and magnitude of these mines leave no doubt that they will be successfully and extensively worked as long as any on the

continent, and that Cerro Gordo will ere long yield to no place in size and importance as a mining town. Hitherto, as we have indicated, a great drawback to the development of this mining camp has been the

Difficulty of Transportation

To and from it. This difficulty still exists, although with a fair prospect of speedy removal. Even under the comparatively limited extent to which these mines are now worked they are able to furnish constant employment to one hundred and twelve mule freight teams. These are more than can be obtained, and the removal of the bullion will always be a serious difficulty until the railroad is advanced to this place. Transportation has been recently somewhat facilitated by placing a small steamer on the lake. The furnaces are at the northern end, and the steamer conveys the bullion to the southern end, a distance of about thirty miles, where it is loaded on the wagons, for conveyance either to tide-water, via Los Angeles, or to the railroad, via this place. At present there are 18,000 bars of bullion, worth probably \$600,000, lying at the foot of the lake awaiting transportation. With the extension of the railroad to this place (which is promised in a few months), or if no more than the twenty mile section the Company is compelled to build by the 15th of July, under the terms of their charter, is completed this year, the difficulty in moving the bullion will be at an end, production will largely increase, and we may expect the whole of this valuable trade to take this route. No effort the people of Los Angeles may then make will suffice to attract any portion of it in that direction.

On the eastern slope of

The Buena Vista Mountain,

About two miles from Cerro Gordo, are also found a number of mines as rich as any in the district. The principal of these are the "Belmont," the "Wittekiad," and the "Friendship." These are mostly owned by practical miners who do their own work and sell their ore to Belshaw and Beaudry. Some of the ore from these mines is said to assay \$700 per ton. There are two furnaces in operation in Cerro Gordo, one belonging to Belshaw and the other to Beaudry. These turn out about fourteen tons of bullion per day, worth about \$28,000.

The Want of Water,

As we have before said, is a great inconvenience in Cerro Gordo. The limited quantity of this liquid that is used there at present, is obtained from a brackish spring three and a half miles distant. Six thousand gallons are used daily, and one hundred pick animals are employed to bring it. The wholesale price is seven cents per gallon and it retails at fifteen cents. Belshaw and Beaudry run three steam engines and they use for these and other purposes two thousand gallons of water per day, the remaining four thousand gallons are consumed by the hotels, saloons, stables, etc. None but expeditious and persons in affluent circumstances can afford to use it for bathing purposes. The sum expended for water is probably not less than six hundred dollars per diem. The spring is owned by one Chas. Duval and he finds it a valuable property.

Belshaw and Beaudry have a small spring four miles from the town, in a northerly direction, which they attempted to utilize for their purposes. It furnishes a very limited quantity of water. They laid pipes ¾ inch in diameter from it to their furnaces. As the surface was almost entirely a solid rock they could not inter them, and when the cold weather commenced this winter they burst, and they have since obtained their supply of water as above stated.

There is another spring eight and a half miles in a northerly direction from the town, but it is three thousand feet below its level.

It is evident that if an abundant supply of water could be introduced into the town, it would not only be of incalculable utility, but a source of immense profit to any company that could carry the undertaking into successful execution. If water could be supplied at such rates that every one could afford a fair supply, no doubt the aggregate amount paid for it would be just as large as at present, justifying the investment of an immense capital in the necessary works. Besides, if water could be furnished at moderate rates it would pay well to wash the ore free from all extraneous and earthy matter before the furnaces are charged with it. As this cannot now be done, there is a great absorption of metal in the slag, and low grade ores are cast aside.

This undertaking has been long discussed, and as the capital required was large, parties could not readily be found willing to engage in it. But we learn that a company has at last been formed for the purpose, composed of men of means and energy. The principal stockholders are Stephen Boushey and F. P. E. Temple who evidently mean business, as they have already let contracts for the construction of the works, which are to be completed by the 15th of July next, when they expect to have a stream of the capacity of ninety thousand gallons per day flowing into the town. They have incorporated with a capital stock of \$200,000, and besides the construction and maintenance of water works, they propose to carry on the business of gold and silver mining, to erect mills and smelting works, to purchase and sell mining and other properties, etc.

The point from which they will convey water is a noted spring, called "Diamond Spring," eleven miles south of Cerro Gordo, situated in a ravine fourteen hundred feet deep, in the midst

of the Inyo range. This spring is a large one, being the source of a considerable stream that flows eastward for many miles, until finally lost in the Saline Valley. It gushes from the granite rock, affording remarkably pure and sweet water, to the estimated amount of 120,000 gallons daily for the whole year. The water will be raised to the top of the ridge by means of pumps worked by two steam engines, through three inch pipes and thence conveyed through a four and a half inch pipe, interred a sufficient depth to be out of reach of frost, to the town, with an average fall of eighty feet to the mile, where it will be received in huge tanks for distribution.

It will be seen that this undertaking will require not only a large outlay, but careful and skillful engineering, and it shows that capital, proverbially timorous, has confidence in the permanency and continued productiveness of these mines.

The Trade of Cerro Gordo

Will build up a splendid agriculture and other permanent industries in this valley, results that do not die out with mutations in markets and other exterior circumstances. This kind of prosperity once established, is enduring and self-sustaining as long as seedtime and harvest continue, unless destroyed through political or moral causes. The great agricultural development of Los Angeles county was largely promoted by the trade of the mines, but it will not be injured by its withdrawal. It is a kind of development that is never barren of permanent good and is always sustained by the demands of universal human necessity.—*Kern County Courier*.

Borax in Kern County.

As already noted in the *Express* a very extensive borate deposit has been found in Kern county, at a distance of about 120 miles from this city. Specimens of the borate have been on exhibition in this office, and are seen to be of a pure and valuable quality.

The deposits discovered by Mr. H. J. Lent lie about 120 miles from this city, about three miles off the Owens River road near Harry Ball's station at Desert Springs. They were found about four weeks ago. They extended from Ball's house to the end of the marsh, about nine miles long and three wide. The borate is found in spots of, three or four acres, more or less. Messrs. Lent, Ball & Chapman's claims contain probably 500,000 tons of borate of lime; of course, they are the best deposits that could be found at the time. Mr. Lent, however, has no doubt that other deposits, equally valuable, though not so great in extent, will be taken up.

Mr. Lent has been in charge of the borax works at Columbus, Nevada, which, with those at Fish Lake, in the same locality, are the only borax deposits hitherto known on this coast, excepting those of Lake county. He thinks that these new discoveries contain a much larger percentage of boracic acid than the deposits at Columbus. He believes that there is room for the employment of a thousand men in these fields and those at Slate Range, sixty miles distant. He has refined some of the borate, and has made an excellent quality of borax, a specimen of which we have. He is having made at Harper & Dalton's some vats and other rude contrivances for the reduction of borate, which he intends to put up upon the ground, and, after reducing the borate there, to ship it to this city for re-shipment. He also thinks of putting up works there for refining, though he believes that it would perhaps be cheaper and better to have a refinery here.

We understand that a refinery, capable of reducing two tons of the borate per day, could be put up here for \$2,000 or \$3,000. He has full faith that the discovery will prove to be a very important one; and his experience in the business lends weight to his opinion.

The value of Nevada borax in San Francisco is \$560 per ton. There is a duty of about \$250 on English borax.

The manufacture of borax in England is said to be confined to one firm in Liverpool, which produces about 2,000 tons per annum, worth there about \$240 a ton.

We learn that the borate deposits have also been found at Slate Range, about sixty miles distant from the original discovery. A considerable number of locators are moving into the borax fields from Inyo and Kern counties, and several parties have gone from Los Angeles county. Messrs. Ansin and Baker, of this city, are by this time upon the ground, and will undoubtedly secure valuable locations.

This city should be the entrepot for the trans-shipment of this valuable article. There seems to be an almost inexhaustible bed of the borate, which will pay largely for shipping, and hundreds of men will no doubt soon be at work upon the ground. The borate is said to be of seventy-five per cent. purity; and the recent suggestion of a correspondent that a refinery for the manufacture of borax should be at once established in this city, is worthy of serious attention. This is a very important matter, and we ought to be active in taking advantage of this fortuitous discovery almost at our door. Let us not, by delay, permit others to reap the chief advantage from this valuable discovery.—*Los Angeles Express*.

GENERAL P. E. CONNOR, on the 28th ult., received a telegram from H. S. Jacobs, to the end that fifty miles of railroad iron and two locomotives will be shipped by the first of May for the Salt Lake, Sevier Valley and Pioche Railroad.

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I am now manufacturing
CYANIDE OF POTASSIUM,

Which I can sell upon better terms than any other
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I make three grades or qualities to suit the require-
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I will be glad to furnish prices to any person ad-
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These Machines Stand Unrivaled.

For rapidly pulverizing and amalgamating ores, they
have no equal. No effort has been, or will be spared
to have them constructed in the most perfect manner
and of the great number now in operation, not one has
ever required repairs. The constant and increasing de-
mand for them is sufficient evidence of their merits.
They are constructed so as to apply steam directly
into the pulp, or with steam bottoms, as desired.

This Amalgamator Operates as Follows.

The pen being filled, the motion of the muller forces
the pulp to the center, where it is drawn down through
the aperture and between the grinding surfaces.
Thence it is thrown to the periphery into the quicksilver.
The curved plates again draw it to the center, where it
passes down, and to the circumference as before. Thus
it is constantly passing a regular flow between the grind-
ing surfaces and into the quicksilver, until the ore is
reduced to an impalpable powder, and the metal amal-
gamated.

Setters made on the same principle excel all others.
They bring the pulp so constantly and perfectly in con-
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The success of this most
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is hereby informed that the only way to
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are upon the wrapper, labels, stopper and
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supplied with a spurious Worcestershire
sauce, upon the wrapper and labels of which the names
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This extract represents in a concentrated form the
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This compound presents the properties of the leaves
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Charactes of Eucalyptus Globulus, useful in
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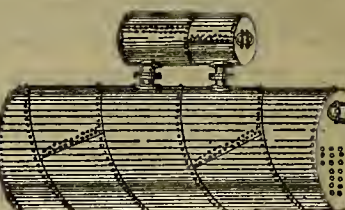
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BUY BARBER'S BIT BRACE. 73

SEND this paper to your friends abroad.

Mining and Other Companies.

On the 12th day of April, 1873, the following companies have been organized, and the names of the shareholders are given below. The names of the shareholders are given below.

Angels Quartz Mining Company—Principal place of business, 408 California street, San Francisco.

Notice is hereby given, that at a meeting of the Board of Directors, held on the 11th day of March, 1873, an assessment of ten cents per share was levied upon the capital stock of the Corporation, payable immediately in United States gold and silver coin, to the Secretary, at the office of the Corporation, Room 5 and 6, No. 302 Montgomery street, San Francisco, California. Any stock upon which this assessment shall remain unpaid on the 15th day of May, 1873, will be delinquent and advertised for sale at public auction, and unless payment is made before, will be sold on Saturday, the 21st day of May, 1873, to pay the delinquent assessment, together with costs of advertising and expenses of sale.

Names.	No. Certificate.	No. Shares.	Amount.
T D Mathewson.....	3	300	\$150 00
T D Mathewson.....	4	400	200 00
T D Mathewson.....	5	500	250 00
T D Mathewson.....	6	600	300 00
T D Mathewson.....	7	700	350 00
T D Mathewson.....	8	800	400 00
T D Mathewson.....	9	900	450 00
T D Mathewson.....	10	1000	500 00
T D Mathewson.....	11	1100	550 00
T D Mathewson.....	12	1200	600 00
T D Mathewson.....	13	1300	650 00
T D Mathewson.....	14	1400	700 00
T D Mathewson.....	15	1500	750 00
T D Mathewson.....	16	1600	800 00
T D Mathewson.....	17	1700	850 00
T D Mathewson.....	18	1800	900 00
T D Mathewson.....	19	1900	950 00
T D Mathewson.....	20	2000	1000 00

And in accordance with law and an order made by the Board of Directors, on the 4th day of March, 1873, so many shares of each parcel of such stock as may be necessary, will be sold at public auction, at the office of Maurice Dore & Co., 327 Montgomery street, San Francisco, Cal., on Monday, April 21st, 1873, at 2 o'clock p. m., of such day, to pay said delinquent assessment thereon, together with costs of advertising and expenses of sale.

GEORGE CONDON, Secretary.
Office, Room No. 1, 408 California street, San Francisco, California (np stairs). ap-3t

The Central Land Company—Principal place of business, 338 Montgomery street, Room 5, San Francisco, Cal.

Notice is hereby given, that at a meeting of the Board of Directors, held on the 11th day of March, 1873, an assessment of fifty cents per share was levied upon the capital stock of the Corporation, payable immediately in United States gold and silver coin, to the Secretary, at the office of the Corporation, Room 5 and 6, No. 302 Montgomery street, San Francisco, California. Any stock upon which this assessment shall remain unpaid on the 15th day of May, 1873, will be delinquent and advertised for sale at public auction, and unless payment is made before, will be sold on Saturday, the 21st day of May, 1873, to pay the delinquent assessment, together with costs of advertising and expenses of sale.

F. B. HASWELL, Secretary of the Central Land Company.
Office, 338 Montgomery street, Room 5, San Francisco, Cal. ap-14t

Columbia Smelting and Mining Co.

Stockholders' Meeting: A meeting of the stockholders of the Columbia Smelting and Mining Co., for the election of a Board of Directors for the ensuing year, and for the transaction of such other business as may come before it, will be held at the office of the Company, Room 14, No. 408 California street, on the 30th day of April, 1873, at 1 o'clock p. m.

J. W. TRIPP, Secretary.

Eagle Quicksilver Mining Company—Location of works, Santa Barbara County, California.

Notice is hereby given, that at a meeting of the Board of Directors, held on the 11th day of March, 1873, an assessment of fifty dollars (\$50) per share was levied upon the capital stock of said Company, payable immediately in gold coin of the United States, to the Secretary, at the office of the Corporation, Room 5 and 6, No. 302 Montgomery street, San Francisco, California. Any stock upon which said assessment shall remain unpaid on Wednesday, March 19th, 1873, shall be deemed delinquent, and will be advertised for sale at public auction, and unless payment is made before, will be sold on Monday, the 24th day of March, 1873, to pay the delinquent assessment, together with costs of advertising and expenses of sale.

WM. H. WATSON, Secretary.
Office, Room 5 and 6, No. 302 Montgomery street, San Francisco, Cal.

POSTPONEMENT.—The day for meeting shares delinquent on the above assessment is hereby postponed until Thursday, the 21st day of April, 1873, and the sale thereof until Monday, the 28th day of April, 1873, at the same hour and place. By order of the Board of Directors.

WM. H. WATSON, Secretary.

Frear Stone Company of California—Location of principal place of business and works, City and County of San Francisco, State of California.

Notice is hereby given, that at a meeting of the Board of Directors, held on the 11th day of March, 1873, an assessment of two dollars per share was levied upon the capital stock of the Corporation, payable immediately in United States gold and silver coin, to the Secretary, at the office of the Corporation, Room 5 and 6, No. 302 Montgomery street, San Francisco, California. Any stock upon which this assessment shall remain unpaid on the 15th day of May, 1873, will be delinquent and advertised for sale at public auction, and unless payment is made before, will be sold on Monday, the 24th day of May, 1873, to pay the delinquent assessment, together with costs of advertising and expenses of sale.

R. WEGENER, Secretary.
Office, 414 California street, San Francisco, Cal.

Gold Run Mining Company—Principal place of business, San Francisco, California.

Notice is hereby given, that at a meeting of the Board of Directors, held on the 11th day of March, 1873, an assessment of ten cents per share was levied upon the capital stock of the Corporation, payable immediately in United States gold and silver coin, to the Secretary, at the office of the Corporation, Corner Market and Spear Streets, San Francisco, California. Any stock upon which said assessment shall remain unpaid on the 15th day of May, 1873, will be delinquent and advertised for sale at public auction, and unless payment is made before, will be sold on Monday, the 24th day of May, 1873, to pay the delinquent assessment, together with costs of advertising and expenses of sale.

O. C. PALMER, Secretary.
Office, Cor. Market and Spear Streets, San Francisco, California.

Hardy Coal Mining Company—Principal place of business, San Francisco, California.

Notice is hereby given, that at a meeting of the Board of Directors, held on the 11th day of March, 1873, an assessment of one dollar per share was levied upon the capital stock of the Corporation, payable immediately in United States gold and silver coin, to the Secretary, Room 5, No. 302 Montgomery street, San Francisco, California. Any stock upon which this assessment shall remain unpaid on the 15th day of May, 1873, will be delinquent and advertised for sale at public auction, and unless payment is made before, will be sold on Monday, the 24th day of May, 1873, to pay the delinquent assessment, together with costs of advertising and expenses of sale.

JOHN HARDY, Secretary pro tem.
Office, Room 5, No. 302 Montgomery street, San Francisco, Cal. m29-4t

Keystone No. One and Two Gold and Silver Mining Company, Place of business, No. 507 Montgomery street, San Francisco, California.

Notice is hereby given, that at a meeting of the Board of Directors, held on the 11th day of March, 1873, an assessment of twenty-five cents per share was levied upon the capital stock of the Corporation, payable immediately in gold coin, to the Secretary, at the office of the Company, No. 507 Montgomery street, San Francisco, Cal. Any stock upon which this assessment shall remain unpaid on the 15th day of May, 1873, will be delinquent and advertised for sale at public auction, and unless payment is made before, will be sold on the 15th (5th) day of May, 1873, to pay the delinquent assessment, together with costs of advertising and expenses of sale.

J. E. JEWELL, Secretary.
Office, No. 507 Montgomery street, San Francisco, Cal.

Lemon Mill and Mining Company.—Principal place of business, City and County of San Francisco, State of California.

Notice is hereby given, that at a meeting of the Board of Directors, held on the 11th day of March, 1873, an assessment of ten cents per share was levied upon the capital stock of the Corporation, payable immediately in United States gold and silver coin, to the Secretary, at the office of the Corporation, Room 5 and 6, No. 302 Montgomery street, San Francisco, California. Any stock upon which this assessment shall remain unpaid on the 15th day of May, 1873, will be delinquent and advertised for sale at public auction, and unless payment is made before, will be sold on Saturday, the 21st day of May, 1873, to pay the delinquent assessment, together with costs of advertising and expenses of sale.

Names. No. Certificate. No. Shares. Amount.

E Van Santen, Trustee.....	2	100	\$100 00
E Van Santen, Trustee.....	3	100	100 00
E Van Santen, Trustee.....	4	100	100 00
E Van Santen, Trustee.....	5	100	100 00
E Van Santen, Trustee.....	6	100	100 00
E Van Santen, Trustee.....	7	100	100 00
E Van Santen, Trustee.....	8	100	100 00
E Van Santen, Trustee.....	9	100	100 00
E Van Santen, Trustee.....	10	100	100 00
E Van Santen, Trustee.....	11	100	100 00
E Van Santen, Trustee.....	12	100	100 00
E Van Santen, Trustee.....	13	100	100 00
E Van Santen, Trustee.....	14	100	100 00
E Van Santen, Trustee.....	15	100	100 00
E Van Santen, Trustee.....	16	100	100 00
E Van Santen, Trustee.....	17	100	100 00
E Van Santen, Trustee.....	18	100	100 00
E Van Santen, Trustee.....	19	100	100 00
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E Van Santen, Trustee.....	24	100	100 00
E Van Santen, Trustee.....	25	100	100 00
E Van Santen, Trustee.....	26	100	100 00
E Van Santen, Trustee.....	27	100	100 00
E Van Santen, Trustee.....	28	100	100 00
E Van Santen, Trustee.....	29	100	100 00
E Van Santen, Trustee.....	30	100	100 00
E Van Santen, Trustee.....	31	100	100 00
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E Van Santen, Trustee.....	37	100	100 00
E Van Santen, Trustee.....	38	100	100 00
E Van Santen, Trustee.....	39	100	100 00
E Van Santen, Trustee.....	40	100	100 00
E Van Santen, Trustee.....	41	100	100 00
E Van Santen, Trustee.....	42	100	100 00
E Van Santen, Trustee.....	43	100	100 00
E Van Santen, Trustee.....	44	100	100 00
E Van Santen, Trustee.....	45	100	100 00
E Van Santen, Trustee.....	46	100	100 00
E Van Santen, Trustee.....	47	100	100 00
E Van Santen, Trustee.....	48	100	100 00
E Van Santen, Trustee.....	49	100	100 00
E Van Santen, Trustee.....	50	100	100 00

And in accordance with law and an order made by the Board of Directors, on the 4th day of March, 1873, so many shares of each parcel of such stock as may be necessary, will be sold at public auction, at the office of Maurice Dore & Co., 327 Montgomery street, San Francisco, Cal., on Monday, April 21st, 1873, at 2 o'clock p. m., of such day, to pay said delinquent assessment thereon, together with costs of advertising and expenses of sale.

GEORGE CONDON, Secretary.
Office, Room No. 1, 408 California street, San Francisco, California (np stairs). ap-3t

Mansfield Gold Mining Company.—Location of principal place of business, San Francisco, California.

Notice is hereby given, that at a meeting of the Board of Directors, held on the 11th day of March, 1873, an assessment of ten cents per share was levied upon the capital stock of the Corporation, payable immediately in United States gold and silver coin, to the Secretary, at the office of the Corporation, Room 5 and 6, No. 302 Montgomery street, San Francisco, California. Any stock upon which this assessment shall remain unpaid on the 15th day of May, 1873, will be delinquent and advertised for sale at public auction, and unless payment is made before, will be sold on Saturday, the 21st day of May, 1873, to pay the delinquent assessment, together with costs of advertising and expenses of sale.

WM. SMALL, Secretary.
Office, Room 14, No. 331 Kearny street, San Francisco, California. m29

Omega Table Mountain Mining Company.

Location of principal place of business, San Francisco, Cal. Notice is hereby given, that at a meeting of the Board of Directors, held on the 11th day of March, 1873, an assessment of five cents per share was levied upon the capital stock of the Corporation, payable immediately in United States gold and silver coin, to the Secretary, at the office of the Corporation, Room 5 and 6, No. 302 Montgomery street, San Francisco, California. Any stock upon which this assessment shall remain unpaid on the 15th day of May, 1873, will be delinquent and advertised for sale at public auction, and unless payment is made before, will be sold on Saturday, the 21st day of May, 1873, to pay the delinquent assessment, together with costs of advertising and expenses of sale.

DAVID WILVER, Secretary.
Office, 23 Merchants' Exchange, California street, San Francisco, Cal. ep-14t

Swansea Mining Company—Location of works, Kelsey Mining District, El Dorado County, California.

Notice is hereby given, that at a meeting of the Board of Directors, held on the 11th day of March, 1873, an assessment of ten cents per share was levied upon the capital stock of the Corporation, payable immediately in United States gold and silver coin, to the Secretary, at the office of the Corporation, Room 5 and 6, No. 302 Montgomery street, San Francisco, California. Any stock upon which this assessment shall remain unpaid on the 15th day of May, 1873, will be delinquent and advertised for sale at public auction, and unless payment is made before, will be sold on Saturday, the 21st day of May, 1873, to pay the delinquent assessment, together with costs of advertising and expenses of sale.

EDWARD P. GRAY, Secretary.
Office, 425 Kearny street, San Francisco, Cal. ap5

Spring Mountain Tunnel Company—Principal place of business, No. 37 New Merchants' Exchange, California street, San Francisco, Cal.

Notice is hereby given, that at a meeting of the Board of Directors, held on the 11th day of March, 1873, an assessment of ten cents per share was levied upon the capital stock of the Corporation, payable immediately in United States gold and silver coin, to the Secretary, at the office of the Corporation, Room 5 and 6, No. 302 Montgomery street, San Francisco, California. Any stock upon which this assessment shall remain unpaid on the 15th day of May, 1873, will be delinquent and advertised for sale at public auction, and unless payment is made before, will be sold on Saturday, the 21st day of May, 1873, to pay the delinquent assessment, together with costs of advertising and expenses of sale.

EDWARD P. GRAY, Secretary.
Office, 37 New Merchants' Exchange, California street, San Francisco, Cal. m15

Success Gold Mining Company—There will be a meeting of the stockholders of the Success Gold Mining Company at the office of the Company, No. 240 Montgomery street, Room 2, on Tuesday, April 22nd, 1873, at 1 o'clock p. m., for the purpose of adopting a Code of By-Laws for the Company.

H. H. SCHAFER, President.
Geo. T. GRIMES, Secretary.

Table Mountain Alpha Mining Company.—Location of principal place of business, No. 438 California street, San Francisco, California.

Notice is hereby given, that at a meeting of the Board of Directors, held on the 11th day of March, 1873, an assessment of ten cents per share was levied upon the capital stock of the Corporation, payable immediately in United States gold and silver coin, to the Secretary, at the office of the Corporation, Room 5 and 6, No. 302 Montgomery street, San Francisco, California. Any stock upon which this assessment shall remain unpaid on the 15th day of May, 1873, will be delinquent and advertised for sale at public auction, and unless payment is made before, will be sold on Saturday, the 21st day of May, 1873, to pay the delinquent assessment, together with costs of advertising and expenses of sale.

WM. L. LUTY, Secretary.
Office, 601 Montgomery street, San Francisco, Cal. ep5-3t

Lady Esten Tunnel and Mining Company.

Location of principal place of business, No. 35 New Merchants' Exchange, California street, San Francisco, California. Location of works, Little Cottonwood District, Utah Territory. Notice is hereby given, that at a meeting of the Board of Directors, held on the 11th day of March, 1873, an assessment of ten cents per share was levied upon the capital stock of the Corporation, payable immediately in United States gold and silver coin, to the Secretary, at the office of the Corporation, Room 5 and 6, No. 302 Montgomery street, San Francisco, California. Any stock upon which this assessment shall remain unpaid on the 15th day of May, 1873, will be delinquent and advertised for sale at public auction, and unless payment is made before, will be sold on Saturday, the 21st day of May, 1873, to pay the delinquent assessment, together with costs of advertising and expenses of sale.

WM. L. LUTY, Secretary.
Office, No. 35 New Merchants' Exchange, California street, San Francisco, Cal. m22

Lady Franklin Gold and Silver Mining Company—Location of works, Silver Mountain Mining District, Alpine County, State of California.

Notice is hereby given, that at a meeting of the Board of Directors, held on the 11th day of March, 1873, an assessment of ten cents per share was levied upon the capital stock of the Corporation, payable immediately in United States gold and silver coin, to the Secretary, at the office of the Corporation, Room 5 and 6, No. 302 Montgomery street, San Francisco, California. Any stock upon which this assessment shall remain unpaid on the 15th day of May, 1873, will be delinquent and advertised for sale at public auction, and unless payment is made before, will be sold on Saturday, the 21st day of May, 1873, to pay the delinquent assessment, together with costs of advertising and expenses of sale.

J. S. LUTY, Secretary.
Office, 601 Montgomery street, San Francisco, Cal. ep5-3t

Stockholders' Meeting—Office of the Noonday Silver Mining Company, San Francisco, April 12th, 1873.

The annual meeting of the Stockholders of the Noonday Silver Mining Company, for the election of Trustees and for the transaction of such other business as may come before it, will be held on Monday, April 22nd, 1873, at 1 o'clock p. m., at the office of the Company, Room No. 25, Hayward's Building, 419 California street, San Francisco, California.

JOSEPH MAGUIRE, Secretary.

Mansfield Gold Mining Company.—Location of principal place of business, San Francisco, California.

Notice is hereby given, that at a meeting of the Board of Directors, held on the 11th day of March, 1873, an assessment of ten cents per share was levied upon the capital stock of the Corporation, payable immediately in United States gold and silver coin, to the Secretary, at the office of the Corporation, Room 5 and 6, No. 302 Montgomery street, San Francisco, California. Any stock upon which this assessment shall remain unpaid on the 15th day of May, 1873, will be delinquent and advertised for sale at public auction, and unless payment is made before, will be sold on Saturday, the 21st day of May, 1873, to pay the delinquent assessment, together with costs of advertising and expenses of sale.

Names. No. Certificate. No. Shares. Amount.

Buscher, J. L.....	1	375	\$ 9 38
Higgin, W. W.....	2	360	18 25
Thackeray, Mrs E.....	3	3300	82 50
Thackeray, Mrs E.....	4	453	11 33
Thackeray, Mrs E.....	5	2250	56 25
Thackeray, Mrs E.....	6	2250	56 25
Thackeray, Mrs E.....	7	2250	56 25
Thackeray, Mrs E.....	8	2250	56 25
Thackeray, Mrs E.....	9	2250	56 25
Thackeray, Mrs E.....	10	2250	56 25
Thackeray, Mrs E.....	11	2250	56 25
Thackeray, Mrs E.....	12	2250	56 25
Thackeray, Mrs E.....	13	2250	56 25
Thackeray, Mrs E.....	14	2250	56 25
Thackeray, Mrs E.....	15	2250	56 25
Thackeray, Mrs E.....	16	2250	56 25
Thackeray, Mrs E.....	17	2250	56 25
Thackeray, Mrs E.....	18	2250	56 25
Thackeray, Mrs E.....	19	2250	56 25
Thackeray, Mrs E.....	20	2250	56 25
Thackeray, Mrs E.....	21	2250	56 25
Thackeray, Mrs E.....	22	2250	56 25
Thackeray, Mrs E.....	23	2250	56 25
Thackeray, Mrs E.....	24	2250	56 25
Thackeray, Mrs E.....	25	2250	56 25
Thackeray, Mrs E.....	26	2250	56 25
Thackeray, Mrs E.....	27	2250	56 25
Thackeray, Mrs E.....	28	2250	56 25
Thackeray, Mrs E.....	29	2250	56 25
Thackeray, Mrs E.....	30	2250	56 25
Thackeray, Mrs E.....	31	2250	56 25
Thackeray, Mrs E.....	32	2250	56 25
Thackeray, Mrs E.....	33	2250	56 25
Thackeray, Mrs E.....	34	2250	56 25
Thackeray, Mrs E.....	35	2250	56 25
Thackeray, Mrs E.....	36	2250	56 25
Thackeray, Mrs E.....	37	2250	56 25
Thackeray, Mrs E.....	38	2250	56 25
Thackeray, Mrs E.....	39	2250	56 25
Thackeray, Mrs E.....	40	2250	56 25
Thackeray, Mrs E.....	41	2250	56 25
Thackeray, Mrs E.....	42	2250	56 25
Thackeray, Mrs E.....	43	2250	56 25
Thackeray, Mrs E.....	44	2250	56 25
Thackeray, Mrs E.....	45	2250	56 25
Thackeray, Mrs E.....	46	2250	56 25
Thackeray, Mrs E.....	47	2250	56 25
Thackeray, Mrs E.....	48	2250	56 25
Thackeray, Mrs E.....	49	2250	56 25
Thackeray, Mrs E.....	50	2250	56 25

And in accordance with law and an order made by the Board of Directors, on the 4th day of March, 1873, so many shares of each parcel of such stock as may be necessary, will be sold at public auction, at the office of Maurice Dore & Co., 327 Montgomery street, San Francisco, Cal., on Monday, April 21st, 1873, at 2 o'clock p. m., of such day, to pay said delinquent assessment thereon, together with costs of advertising and expenses of sale.

WM. SMALL, Secretary.
Office, Room 14, No. 331 Kearny street, San Francisco, California. m29

Omega Table Mountain Mining Company.

Location of principal place of business, San Francisco, Cal. Notice is hereby given, that at a meeting of the Board of Directors, held on the 11th day of March, 1873, an assessment of five cents per share was levied upon the capital stock of the Corporation, payable immediately in United States gold and silver coin, to the Secretary, at the office of the Corporation, Room 5 and 6, No. 302 Montgomery street, San Francisco, California. Any stock upon which this assessment shall remain unpaid on the 15th day of May, 1873, will be delinquent and advertised for sale at public auction, and unless payment is made before, will be sold on Saturday, the 21st day of May, 1873, to pay the delinquent assessment, together with costs of advertising and expenses of sale.

Machine Builders.

ESTABLISHED 1851.

PACIFIC IRON WORKS,

First and Fremont streets,

SAN FRANCISCO

IRA P. RANKIN, A. P. BRAYTON,
GEO. W. FOGG, Superintendent.

Steam Engines and Boilers,

MARINE AND STATIONARY,

IRON AND BRASS CASTINGS

Mining Machinery of Every Description,

And all other classes of work generally done at first-class establishments, manufactured by us at the lowest prices, and of the best quality.

Particular attention paid to Jobbing Work and Repairs.
N. B.—Sole Agents for sale of HUNTOON'S OCEAN-BRATED PATENT GOVERNOR.
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FULTON

Foundry and Iron Works.

HINKLEY & CO.,

MANUFACTURERS OF

TEAM ENGINES,

Quartz, Flour and Saw Mills,
New Improved Steam Pump, Brodie's Improved Crusher, Mining Pumps, Amalgamators, and all kinds of Machinery.

N. E. corner of Tehama and Fremont streets, above How street, San Francisco. 8-47

GEORGE T. PRACY, MACHINE WORKS,

109 and 111 Mission Street,

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These Works have lately been increased, by additional Tools, and we are now able to turn out any kind of work, equal to and cheaper than any establishment in the State; that is to say:—

STEAM ENGINES,
Flour and Saw Mills,
QUARTZ MACHINERY
Printing Presses,
AND MACHINERY MADE OF EVERY DESCRIPTION.

Improved Safety Store Hoists,

Fitted with Cutting's Patent Cams, unequaled for safety, convenience and cheapness. This Hoist can be built for about half the price of any other in use. To be seen at HAWLEY & CO.'S.

ALSO, MANUFACTURER AND SOLE AGENT FOR
Pracy's Celebrated Governor.
TURNING LATHES, Etc., constantly on hand.
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ROOT, NEILSON & CO.,

MANUFACTURERS OF

STEAM ENGINES, BOILERS,
CROSS' PATENT BOILER FEEDER AND SEDIMENT COLLECTOR

Dunbar's Patent Self-Adjusting Steam Piston

PACKING, for new and old Cylinders.

And all kinds of Mining Machinery.
Front Street, between N and O streets,
SACRAMENTO CITY.

PACIFIC Rolling Mill Company,

SAN FRANCISCO, CAL.

Established for the Manufacture of

RAILROAD AND OTHER IRON
—AND—
Every Variety of Shafting,
Embracing ALL SIZES of

Steamboat Shafts, Cranks, Piston and Connecting Rods, and Locomotive Axles, and Frames

HAMMERED IRON

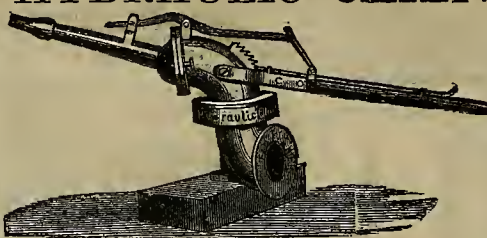
Of every description and size.

Orders addressed to PACIFIC ROLLING MILL COMPANY, P. O. Box 2024, San Francisco, Cal., will receive prompt attention.
The highest price paid for Scrap Iron. 27143

FISHER'S KNUCKLE JOINT AND NOZZLE

IS THE
Cheapest and Best
Hydraulic Machine
in use.

9723-4f



The only reliable party in the Hydraulic business who protects his patrons.
Address V. H. FISHER, Nevada, Cal.

HYDRAULIC MINERS, TAKE NOTICE—I hereby caution Miners and Manufacturers against making, buying, selling or using a Hydraulic Machine or Joint known as the Little Giant, manufactured and sold by R. R. & J. Craig and Richard Hoskin, as the same is an infringement upon the invention of the machine known as FISHER'S HYDRAULIC CHIEF, secured by Letters Patent, No. 110,222, dated Dec. 20, 1870. All parties participating in such infringements will be rigorously prosecuted. Nevada, Jan. 13th.

OCCIDENTAL FOUNDRY,

187 and 189 First st., near the Gas Works, San Francisco.

STEIGER & BOLAND, IRON FOUNDERS.

IRON CASTINGS of all descriptions at short notice. All orders punctually executed in time agreed on. Particular attention paid to making superior Shoes and Dies. Among the special castings of this Foundry are the well known CALLAHAN GRATE BAR, of superior merit for burning screenings—all size Bars. STRATTON'S JACK SCREWS, all sizes. Superior, compact and effective Horse Powers, Pumps, Agricultural Castings, Ingot Moulds, Assaying and Refining Retorts and Kettles, and a great variety of other end special castings.

STEIGER & BOLAND Proprietors.

Steiger & Boland are the sole Manufacturers of the Improved Hepburn Roller Pan. The patterns having all the improvements to those Pans, are at the Occidental Foundry, enabling the Establishment to deliver all pans and parts thereof with uniformity, finished in the best style, and at the lowest possible price. Pan Castings furnished the trade, with liberal facilities for erection, &c. All persons are cautioned against making, selling or using these Pans, except through the authorized agents and manufacturers, viz., Steiger & Boland, of the Occidental Foundry, S. F.

22725-3m

WM. H. HEPBURN.

GEO. W. PRESCOTT. C. W. SCHEIDEL. W. R. ECKART

PRESCOTT, SCHEIDELL & CO.,

MARYSVILLE FOUNDRY.

Corner of B and Fourth streets, Marysville, Cal.

MANUFACTURERS OF

STEAM ENGINES,

STATIONARY AND PORTABLE

SAW AND GRIST MILLS,

Hydraulic Machinery,

Quartz Crushing and Amalgamating
Machinery

Of every description, constantly on hand.

Plans and estimates furnished upon application. Repairs upon all kinds of Machinery promptly made, and at moderate charges.

Having unexcelled facilities, we are prepared to make to order, at short notice, anything required in our line. Specimens of our work may be seen in all the mining regions on this coast.

NATIONAL LOCOMOTIVE WORKS.

DAWSON & BAILY,

Connellsville, Penn.,

Manufacture LOCOMOTIVES adapted to
Every Kind of Railway Service.

NARROW GAUGE AND MINE LOCOMOTIVES A SPECIALTY.

All work accurately fitted to gauges, and thoroughly interchangeable.

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Photographs of Locomotives can be seen at the above Number. 127254f

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Every Description of Ornamental Work,
Stove and French Range Work, grate and fender work, small machines of all descriptions, house work, etc., promptly attended to.
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CO-OPERATIVE,

First Street, bet. Howard and Folsom, SAN FRANCISCO

Machinery and Castings of all kinds.

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MACHINES

Manufactured

TO ORDER,

to throw from

One

to an

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STREAM.

Address V. H. FISHER, Nevada, Cal.

THE RISDON

Iron and Locomotive Works.

INCORPORATED.....APRIL 30, 1868.
CAPITAL.....\$1,000,000.

LOCATION OF WORKS:
Corner of Beale and Howard Streets,
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Manufacturers of Steam Engines, Quartz and Flour Mill Machinery, Steam Boilers (Marine, Locomotive and Stationary), Marine Engines (High and Low Pressure). All kinds of light and heavy Castings at lowest prices. Cams and Tappets, with chilled faces, guaranteed 40 per cent. more durable than ordinary iron.

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24717-07

CALIFORNIA BRASS FOUNDRY,

No. 125 First street, opposite Minna, SAN FRANCISCO.

ALL KINDS of Brass, Composition, Zinc, and Babbit Metal Castings, Brass Ship Work of all kinds, Spikes, Sheathing Nails, Rudder Braces, Hinges, Ship and Camboat Sells and Joints of superior tone. All kinds of Cock and Valves, Hydraulic Pipes and Nozzles, and Hose Couplings and Connections of all sizes and patterns, furnished with dispatch.
PRICES MODERATE. J. H. WELF. V. KINGWELL

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LIGHT AND HEAVY CASTINGS,
of every description, manufactured, 24716-9r

Machinery.

IMPORTANT TO Quartz Mining Companies.

IMPROVED PATENTED Hardened Cast Steel Shoes & Dies.

The undersigned are prepared, at short notice, to furnish IMPROVED PATENTED HARDENED CAST STEEL SHOES AND DIES, for Quartz Mills of every pattern. This improvement supplies a want long needed by persons engaged in Mining enterprises.

They are more economical and cheaper than cast iron shoes, as they wear from four to six times as long, and crush a greater quantity, as they retain their full diameter, never chipping from the edges. This, with the time saved in replacing worn and broken iron shoes and Dies, and the great saving of freight to remote mills and mines, makes a vast difference in the cost of reduction of ores.

WE ALSO FURNISH
Cast Steel Tappets, Cams, Picks and Hammers,

Which possess the same advantages of Economy and Durability, and deserve the special attention of Miners and others engaged in quartz crushing.

The Superior Strength of these steel castings—the fact that they can be FORGED AND WELDED as easily as bar steel—their cheapness and great accuracy, as compared with forged iron—cannot fail to make them desirable for many purposes, where forged iron and steel have heretofore been used. Among such articles we mention:

ROLLING MILL CASTINGS,
Bevel and Spur Wheels, Guides, Spindles, Dies, etc.

AGRICULTURAL CASTINGS,
Reaper Guards, Plow Shares, Mold Boards, Plow Jointers, etc.

Anvils, Sledges, Vices, Masons' Hammers, Blacksmith Hammers, Mallets, R. R. Frogs, etc.

And other articles requiring solidity and great strength.

DONKEY ENGINES FOR HOISTING,
Mining Machinery, Etc.

Persons giving orders will send diagrams and measurements of Shoes and Dies, etc., as above.

J. G. KITTREDGE & CO.,
No. 515 California street, San Francisco.
12725-4f

THEODORE KALLENBERG, MACHINIST,

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Repairing done on very Reasonable Terms and in the best manner. No. 32 Fremont street, S. F. 19723-3m

Scaling and Foaming Prevented and Fuel Saved.

Enquirers are respectfully informed that

WARSOP'S AERO STEAM SYSTEM

Has been well tested, during three years, in England. Besides the above advantages, it greatly prolongs the life of Boilers, Tubes and Fire-bricks.

It is a cheap contrivance, and easily applied to any engine. Illustrated Circulars, showing the appliance and describing its advantages, are sent to all applicants.

All who are troubled with Scale and Foaming may rely on this system of prevention—also on saving at least 20 per cent. of fuel.

RIGHTS for States and for individuals will be sold on liberal terms.

J. L. SANFORD,

General Agent for United States,

420 Montgomery street, San Francisco,
And Box 909, P. O.

Information Required to Give an Estimate of Warsop's Apparatus:

- 1.—Diameter of Cylinder.
- 2.—Length of Stroke.
- 3.—Number and Length of Boilers—Tubes or Flues.
- 4.—Distance of Boilers from Engine.
- 5.—Can Pump Piston be attached to Cross-head of Engine?

It can, however, be driven by any of the usual appliances that work the Water-Feed Pump. These items will enable me to give a near estimate of the cost.

J. L. SANFORD, General Agent.

Notice is hereby given, that the copartnership heretofore existing between A. J. Severance,

Charles W. Randall and J. Gus. Burt, under the firm name of "Severance, Holt & Co.," is this day dissolved by mutual consent. A. J. Severance, having purchased all the interest of his late partners, will continue the business of manufacturing and setting Diamond Drills as before, under the style of A. J. Severance & Co. Dated San Francisco, Nov. 24, 1871.

Office, 315 California street. A. J. SEVERANCE,
CHAS. W. RANDALL,
J. GUS. BURT.

22723-4f

BURLEIGH ROCK DRILLS

—AND—

Air Compressors.

The Burleigh Rock Drills, which have stood the test of five years' constant use at the Hoosac Tunnel, and which are now in use in nearly every State in the Union, as well as in Europe and South America, are unequalled in efficiency and economy by any other Drilling Machine. They are of various sizes, and equally well adapted to Tunneling, Shafting, Open Cut or Quarrying, and will drill six to ten inches per minute in granite. They are driven by steam above ground. The Burleigh Air Compressor is the best engine yet devised for furnishing the "air motor" for the many purposes to which it is now being used.

They are to be used on the St. Gothard Tunnel, Switzerland; Tunnel 13 miles long. We refer to the following gentlemen and works:

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Mess. Shanley Hoosac Tunnel, Mass.
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Sidney Dillon Fourth Avenue Work, N. Y.
Col. Roebbing East River Bridge Company, N. Y.

For further information, etc., address

L. C. PARKE,

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AGENT FOR THE PACIFIC COAST. 715

The California Powder Works

No. 314 CALIFORNIA STREET.

SAN FRANCISCO.

Manufacturers and have constantly on hand

SPORTING, MINING, AND BLASTING POWDER,

OF SUPERIOR QUALITY, FRESH FROM THE MILLS. It being constantly received and transported into the interior, is delivered to the consumer within a few days of the time of its manufacture, and is in every way superior to any other Powder in Market.

We have been awarded successively

Three Gold Medals

By the MECHANICS' INSTITUTE and the STATE AGRICULTURAL SOCIETY for the superiority of our products over all others.

We also call attention to our

HERCULES POWDER.

Which combines all the force of other strong explosive now in use, and the lifting force of the BEST BLASTING POWDER, thus making it vastly superior to any other compounded now in use.

A circular containing a full description of this Powder can be obtained on application to our Office.

16720-3m JOHN F. LOHSE, Secretary.

Pacific Irrigating Pipe and Pump Co.,

A. M. JEWELL, Superintendent.

MANUFACTURERS OF ALL KINDS OF

Wooden Pumps and Pipe.

OFFICE AND FACTORY, SOUTH POINT MILLS,

Berry Street, between Third and Fourth,

SAN FRANCISCO.

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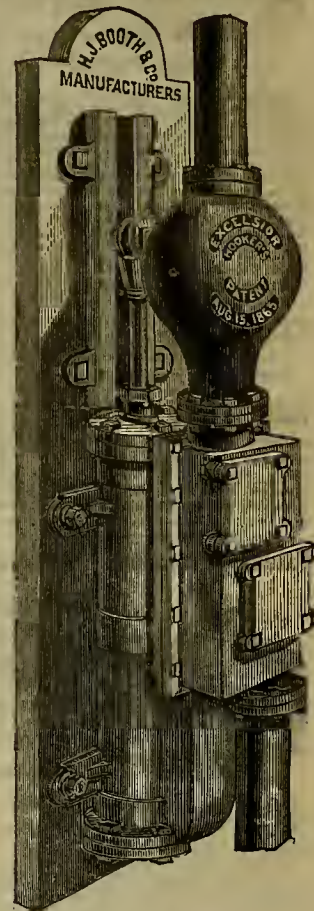
EXCELSIOR MINING PUMP.



NO. 2-MOUNTED.



No. 3-SHIP.



NO. 5-MINING.

With six years use of this Pump we confidently recommend it.

Use for Mining or Prospecting.

It is the CHEAPEST Pump in the market.

There is NO Trade Pump made of equal strength and power.

Every Pump is tested by hydraulic power to 125 lbs. to the square inch. So every Pump, large or small, is

WARRANTED

To Force Water 250 Feet High.



VALVE.

ALL PUMPS WARRANTED. All Expense of Transportation Refunded if the Pumps are Proved Defective.

Send for Circular.

Brittan, Holbrook & Co.,

111 and 113 California street, San Francisco, (and also Sacramento), General Agents.

BLACK DIAMOND FILE WORKS.



G. & H. BARNETT,
Manufacturers of Files of every Description,
Nos. 29, 41 and 43 Richmond street,
Philadelphia, Pa.

MILL SAW FILES A SPECIALTY.
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NELSON & DOBLE,

AGENTS FOR

Thomas Firth & Sons' Cast Steel.



MANUFACTURERS OF
Sledges, Hammers, Stone
Cutters', Blacksmiths'
and Horse-Shoers'
Tools.

13 and 15 Front Street, near Market, San Francisco
1874-1875

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THE

Risdon Iron and Locomotive Works

Corner Howard and Beale Streets,

Are prepared to make SHEET IRON AND ASPHALTUM PIPE, of any size and for any pressure, and contract to lay the same where wanted, guaranteeing a perfect working pipe with the least amount of material.
Standard sizes of railroad Car Wheels, with special patterns for Mining Cars. These small wheels are made of the best Car Wheel Iron, properly chilled, and can be fitted up with the improved axle and box—introduced by this company, and guaranteed to outlast any other wheels made in this State.

All kinds of Machinery made and repaired.
24v22-3m JOSEPH MOORE, Superintendent.

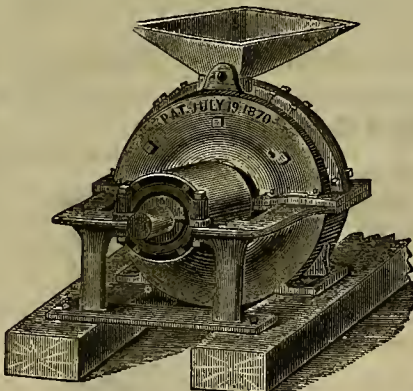
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(Over W. T. Oarratt's Brass Foundry),

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6v23-3m

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THE LIGHTNING MILL

For Pulverizing Quartz,

"Charleston Rock," and all Native Phosphates, Flint, Feldspar, Iron Ore, Manganese, Antimony, Carbon, Corundum, Old Crucibles, Barytes, Bismuth, Stone, Slate, Soapstone, Graphite, Glass, Marble, Plaster, Anthracite and Bituminous Coals, etc.

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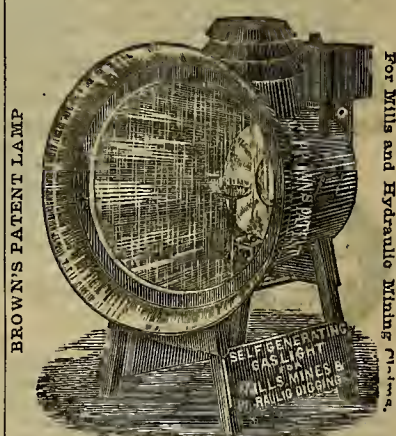
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Little York, Nov. 5, 1872.

For further particulars, address,
1622-tt C. B. BROWN, Placerville, Cal.

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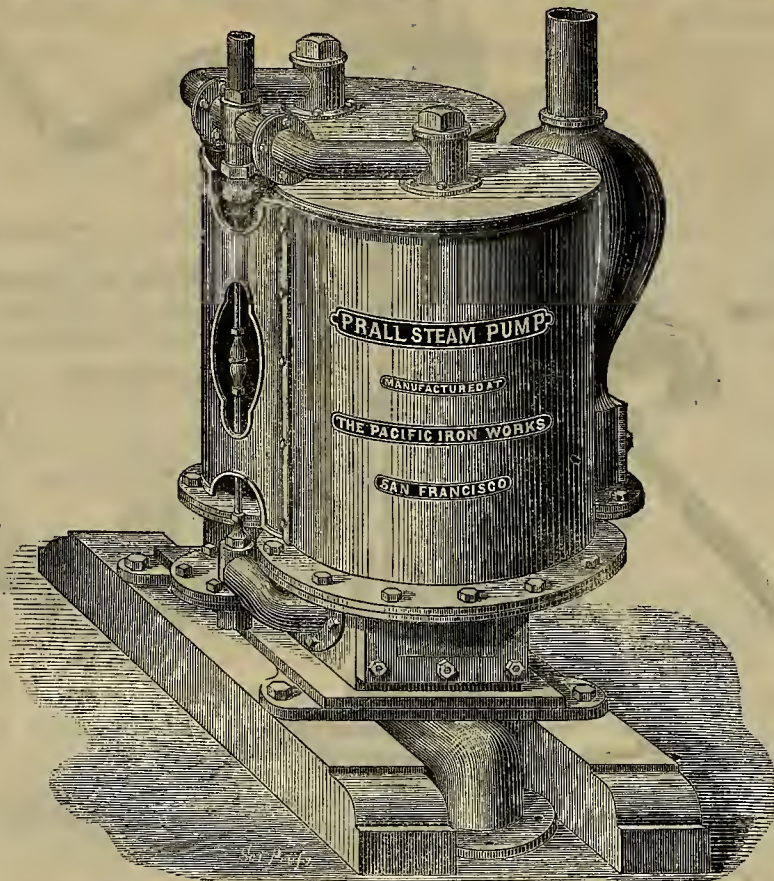
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The steam is condensed instead of being exhausted into the shaft or tunnel. It is not affected by mud, sand or grit, having no working parts to wear or cut out.

It is economical of steam, because all friction is avoided, and the steam is made to do double duty, that of direct pressure and then by condensation, utilizing the atmospheric pressure to lift the water to the Pump.

It requires no lubrication nor any attention whatever.

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It requires less steam to elevate water from 20 to 30 feet than would be necessary to move any other style of Pump doing no work.

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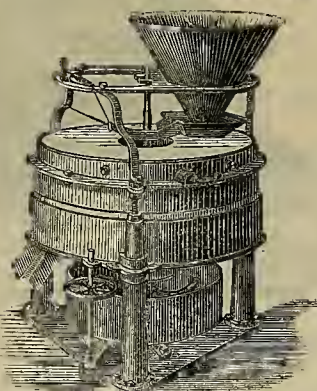
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Mill Picks, Mill Picks Dressed, Mill Stones Re-
paired and Rebuilt.

Mill Stones Balanced with FELLEBAUM'S PATENT BALANCE, of which I am sole proprietor for California, Oregon, and Washington Territory. 15v26dt

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GIANT POWDER, A NO. 2 GIANT POWDER,

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BANK BLASTING, COAL MINES,

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The system of transporting material, such as Ores,
from the mine to the mill, Earths for embankments,
Rock from quarries, etc., by means of steel wire rope,
has been well tested and found more economical,
advantageous and reliable than any other method
of transportation; and to the annexed certificate in con-
nection therewith I beg to call the attention of those in-
terested:

EUREKA, Nevada, July 10, 1872.
T. M. MARTIN My dear sir: On your leaving for San
Francisco, it gives me great pleasure to hand you my
written acceptance of the HALLIDIE TRAMWAY put
up by you upon our mine in Freiburg.

It is a perfect success, discharging ten tons of ore per
hour with two men's labor. It is perfectly simple in
construction, and, as far as I can judge, there is nothing
about it to ever get out of order—nothing to wear out.
While our requires but about two thousand five hun-
dred feet of wire rope, I can see no reason why the line
could not be extended almost indefinitely with equally
happy results. Again, the carrying capacity might be
doubled or quadrupled if desired. After several weeks
trial upon our mine, the unanimous verdict of all who
have seen it is a complete, unquestioned success. If
this can be of any service to you, use it in any way you
think proper. Very respectfully, O. O. GOODWIN.

EMMA HILL CONSOLIDATED MINING CO.,
Little Cottonwood, Utah.

Superintendent's Office, Sept. 23, 1872.
T. M. MARTIN, Esq., Sir: The Ropeway constructed by
you (HALLIDIE'S PATENT) for the Emma Hill Consoli-
dated Mining Company, has been built in a most substantial
and workmanlike manner, and is at this time in splendid
working condition. I most cheerfully accept the work for
the Company, and recommend it to others wishing a sure
and speedy transit for ores over places impracticable for
wagon roads, etc. Respectfully,
L. W. COLBATH, Superintendent.

"The Vallejo works smoothly with the elevated wire
tramway, which carries its load of ore as quietly and easily
as if there was no winter or snow in the world."

"Whatever the objections to wire tramways may be on
account of their cost, I have seen nothing yet that even
approaches them in the facilities they afford for moving
ore at all seasons of the year."—Correspondent Utah Min-
ing Journal, Alta, Jan. 8, 1873.

The Vallejo Ropeway.

The Vallejo Tunnel Company's Tramway Little Cot-
tonwood, built on the HALLIDIE PATENTED PLAN, is a
complete success. It is between 2,500 and 2,600 feet in
length, and is supported by thirteen stations. The fall in
the distance is about 80 feet, and the wire rope, which is
three-fourths of an inch in diameter, will easily and easily
deliver one hundred tons in six hours. The machinery is
automatic, loading and unloading the sacks or binnets.
About one ton and a half can be sent down at once.
The stations are about two hundred feet apart, and the entire
apparatus is strong and safe. As the wire rope is elevated
about forty feet above the surface of the hill, the Tramway
can be worked all winter long, without the slightest trou-
ble.—Utah Mining Journal, Salt Lake, Sept. 23, 1872.
Mining Companies and others desiring to negotiate for
the erection of this system of Ropeway, can communicate
with me personally, or through Postoffice Box 964.

A. S. HALLIDIE, Patentee,
112 and 114 California Street, SAN FRANCISCO.

WIRE ROPE

For hoisting from mines, transmitting power, ship rigging,
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Wire of all kinds and descriptions, furnished at lowest
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MINING AND SCIENTIFIC PRESS.

An Illustrated Journal of Mining, Popular Science and Progressive Industry.

BY DEWEY & CO.,
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SAN FRANCISCO, SATURDAY, APRIL 19, 1873.

VOLUME XXVI.
Number 16.

California Pioneers.

In speaking of the early days of California, we are too apt to place our dates to correspond with that of the immigration incident to the discovery of gold, and thus the '49-ers, as they were called, bore off, to a great extent, the palm and credit really due to more adventurous spirits than themselves.

We should go back nearly a decade, or to '41, and crown with the laurel of adventure the really early pioneer—for it was in that year that the first company, headed by Robert H. Thomas, not as hunters and trappers, but as a company of adventurers, determined to see what they could see, and appropriate, if they saw fit and right, first traversed "the plains," crossing by the same route, via Salt Lake, Humboldt river, and the Sierras, that afterwards became the great highway of the overland immigration of 1849 and onward, and that only ceased when the iron rail had spanned the continent.

It is to the few who remain of that band of brave spirits composing that first overland company that we dedicate the engraving presented herewith: for now

All broken in that little band,
Patient of toil and strong of hand,
Who left Atlantic homes to rear
An Empire's proud foundation here.

We present in our illustration the company just as they are winding over the first rugged height that brings to their view the distant Sierras. With what exultations of joy and triumph they beheld the rounded peaks, lifting their snowy turbans to the skies, can only be appreciated by those who in later years made the same tedious journey, though to a great extent left of the sufferings and dangers incident to the first adventure, when

"The Indian from his lodge of bark,
The grey bear from his den,
Beyond their camp-fires' wall of dark
Gazed on the mountain men."

We could give the names of the men who composed this adventurous band, but as many of them now "sleeps the sleep that knows no waking," it would seem like calling them from the tomb; and though our first interest is ever with the living, we are glad to do honor to the memory of the men of this pioneer band of 1841, who, when resting for the first time under the shadows of the mountains, that after 170 days of weary toil they had at length reached,—

"All night above their rocky bed,
They saw the stars march slow,
The wild Sierras over head;
The desert's dearth below.

Still upward turned with anxious strain,
Their leader's sleepless eye,
Where splinters of the mountain chain,
Stood back against the sky.

They set their faces to the blast,
They trod the eternal snow,
And, faint, weary, bleeding, halted at last
The promised land below.

Behind, they saw the snow-cloud tossed
By many an icy horn;
Before, warm valleys, wood embosomed,
And green with vines and corn."

THE EPIZOOTY is expected to be in this city in a few days, as they have it in Oakland, San Jose, and elsewhere in our vicinity. The disease is, however, in a mild form.

Death of an Inventor.

English papers announce the death of Mr. R. W. Thompson, best known in this country as the inventor of the rubber tire for road engines. Mr. Thompson, though quite a young man, (41) had become quite noted as an inventor. His first invention was made at the age of nineteen, and consisted of a device for firing blasts by electricity. This invention was brought out under the patronage and by advice of Faraday. He commenced his experiments on india-rubber tires in 1844, when he was but 22 years of age; but made very little progress at that time from the fact of the scarcity and costliness of rubber. He invented a steam crane and hydraulic dock in 1860. He was the

Mining Suits.

An injunction suit has been commenced in the Circuit Court by B. B. Titcomb, of Boston, Mass., against Michael Dougherty and Willis Jones. The complaint alleges that on the 2d of June, 1869, the defendants were the owners of the Miners' Ditch and the Union Ditch, in Placer county, and the water rights appertaining to them. The Miners' Ditch has its origin in Short Tail Cañon, and the Union Ditch in Black Hawk Cañon. The Miners' Ditch runs across Black Hawk Cañon in a flume, and the waters of the Cañon flow along the natural bed into a dam, and then into Union Ditch, save from the 5th of November, 1872, to the 7th of March, 1873, during which period the defend-

Utilizing Water Power on this Coast.

We notice that the surveying party who have been making a survey of Russian River to ascertain whether there was water and fall enough, have finished their work. The route surveyed was impracticable and they will shortly look for another. They ascertained that there was 73 feet fall from Soda Rock to a point in the river just east of Healdsburg. It is to be hoped that a practicable route for conducting the water will be found so it will greatly assist manufacturing enterprises. The Healdsburg people are in earnest, and wish to establish factories at their town which will have the great advantage of water power. Some attention is being turned to the Truckee River, for

the same purpose. That river never freezes and it falls about 40 feet per mile. There is said to be no danger of overflow, and every four hundred yards from Bigler to Truckee, facilities for natural water power exist, and the same is the case from Truckee down to Reno, about 35 miles.

With the great scarcity or inferior quality of coal in the State, we should utilize all the water power attainable. The great difficulty has been that these facilities for water power, are at such a distance in the interior or away from railroads, that the advantage of the cheap power, is overcome by the cost of freight on the materials and products; therefore, manufacturers found it more to their advantage to use steam here at San Francisco, than water power in the interior, notwithstanding this comparatively high cost of fuel. Moreover, many streams which afford water power in the winter and spring, are

too low towards the middle, and end of our summers, to be available for that purpose. With an increase in railroad construction, we had hopes that this state of things would cease, and that the banks of many different streams would be the location of various manufacturing enterprises, all run by water power. This is not yet the case for reasons before mentioned. In some localities it is found almost as cheap to transport freight by teams as it is to use the facilities afforded by the railroads, since the railroad charges are so high. Time and competition may reduce these tariffs, in which case there is no doubt but that many mills and factories of different kinds will be established where water can be used for the power required.

BORAX.—Prospectors from the lately-discovered borax deposits near Desert Springs station on the road to Owens river, report locations made for miles. The borax is found in spots and varying in thickness. The deposits on the Seate Range, 200 miles northeasterly, in San Bernardino county, are even more extensive. Vats for reducing the borax, and other appliances, have been ordered, and crusts of borax are taken out and piled, resembling hay-ricks, for reduction or shipment.

THIRTY-TWO hundred acres of mining land have been surveyed and located on Buckeye Mountain in Del Norte county.



FIRST VIEW OF THE SIERRAS BY CALIFORNIA PIONEERS.

first to conceive the idea of a band saw, and also the elliptic rotary engine, both of which, however, were afterwards worked out by other heads. He was destined by his father for the pulpit; but an invincible hatred for Latin barred his path in that direction, led him into more practical studies, and finally introduced him to the mechanical and scientific world, where he found himself quite at home. It is said that when a boy of some 16 years he manifested a great fondness for experimental chemistry and electricity; so earnest was he in the prosecution of the former, in his lodging room, which he had fitted up for a laboratory, that his parents found it prudent to assign him a separate building where frequent explosions might become less harmful to others.

Mr. Thompson was a great sufferer for many years, and his death was not unexpected by his friends.

RAYMOND AND ELY VS. HERMES.—This very important suit is still going on in Pioche, and is exciting a great deal of attention. The mass of testimony is so voluminous that it is impossible for us to give it in full, and a condensed report would be very unsatisfactory. A decision will probably be given very shortly, and the local papers will then most probably give a digest of the case, which may be interesting to our readers.

MINERS at Bannock, Idaho, are busily engaged preparing for mining operations, and look for moderately good times.

suits diverted the waters into flumes of the Union Ditch where it crosses Black Hawk Cañon. On the 2d of June, 1869, Dougherty and Jones being the owners and in possession of Union Ditch and the water privileges in and to the waters of Black Hawk Cañon, sold the same to O. W. Henderson, who, on the 1st of November, 1872 sold said ditch to plaintiff. This ditch is constructed from Black Hawk Cañon to the town of Yankee Jim's, in Placer county, for the sole purpose of carrying water to be used in working the Davis mine. The defendants are the owners of a mine, and needing a large supply of water did, on the 5th of November, 1872, divert the water from Black Hawk Cañon for their use until the 7th of March, 1873, when it was stopped. The defendants now threaten that they will again turn the waters of the ditch, and plaintiff asks for an injunction enjoining them from doing so. A temporary injunction was granted by Judge Sawyer and an order that the defendants show cause why it should not be made perpetual.

A suit has been instituted in the Nineteenth District Court, by William C. Coley, against the well known firm of Cross & Co. The complaint alleges that Cross & Co. agreed, with one John A. Robertson, that in the event of the consummation of the sale of the Keystone mine, situated in San Luis Obispo, they would pay him \$2,000 for his services in effecting the sale and the transfer of all his interest in the extension east of the mine. The sale of the mine was consummated after some considerable trouble, and Robertson transferred his claim to Coley who now demands judgment for the sum named.

CORRESPONDENCE.

A Rambler's Ride Over Rough Roads.

There are more things in this world, Horatio, Than are dreamt of in our mean philosophy.—*Hamlet*.
 EDITOR PRESS.—Who am I? I guess stranger you'd give a "red" to know. Well, I'm not all at once going to acquaint you with my affairs, pecuniary, private, personal, or political; suffice it to say that I was horn and have lived all my life a "rambler." I have had a hard time "of it since Mother Nature first took it into her hand to make me an inhabitant of this little" skittle ball; many a shaking and rough tumble have I had over its puny circumference. Many a shakehands with rough and ready pioneers of civilization and progress, and now find myself as the French say, "dans cettesleir," without knowing where to go, what to do, nor how to do it. In fact, I have come to California, like Paul Pry of fame, just popped in; I hope I don't intrude and I wish to give you a few of my ideas of what is doing in your beautiful country, if you will let me have my own way, and tell what I know in my own fashion, for I'm a "hard nut to crack" if you don't let me have my head to myself. Suffice it then to say, that I dropped down into Montgomery Street, a few days since, from "t'other side of Jordan," and feel pretty much as useful as a bull in a China store.

My first impressions of your city were that I was not wanted at all. Stocks were nowhere. Brokers looking "broke." "Wild Cats" without tails, a "Bear" Garden without a Picador "to bull up." "Judas Iscariot," I exclaimed, of what earthly use shall I be here. "No one to love me, none to caress." What must I first turn to. I looked in your newspapers, saw no advertisements of "Help Wanted" except the following: Wanted—A bootblack, good wages, apply, etc. Wanted—A man to do chores round a stable. Wanted—A bedmaker for a hotel, up country, etc., *ad infinitum*, *et nauseandum*. What can this mean, say I, have I come to this Paradise, after spending \$500 and two months hard life on board ship, merely to get employment as a shoeblack, etc.? for which positions in social life I find myself quite incapable, (please Mr. Editor, consider this as a private communication,) or am I to wait until some intelligent stranger dives down into the recesses of my waistcoat pockets, and finding that I am pretty considerably "froze out," will put me up to a way of getting an honorable subsistence, without taking a pleasure trip to San Quentin, or making a tour round the admirably arranged police establishments or caravansaries, open for the welcome of the "Robert Macnives" of your city. No, say I, I'll first stick to my old "game" of rambling, and as, during the last 25 years, it has allowed me to remain out of the "Alms-house" although I've frequently rubbed a little of the "whitening" off its exterior on the back of my \$25 dress coat, I'll try it again; so off for the road.

(Shooting over valleys, riding over ridges, Grooving under tunnels, skimming over bridges; Obi! 'tis a pleasant thing—this riding on the rail.)
 And here I am, up in the air "higher than a kite," in Virginia City, Nevada. Oh, what a change this is from your beautiful Frisco. No streets, no stores, no lumps, no beautiful nymphs like those which grace Kearny street from four to seven p. m., on an ordinary week day. Through shanties; tumbled down rockeries; low gambling hells; wretched stables where the devil's spirits are "retailed" for a "quart" a glass, (such benzue or morphine shop) called *par plaisance* saloons; a hotel; a theater, closed, upon which the moss of ages seems to have proved the "thin" quality of its former troupe, and in which Shakespeare must have been long since "torn to tatters;" and the remaining habitations so thickly grouped and scantily built that one would suppose they were peopled at the time of the "flood," and used only as a means of escape from the prevailing deluge. Here, thinks I, must be the "Ultima Thule" described by Eneas, or the "Inferno," so prettily sketched by my friend Dante. But where are the Cyclops? It is 8 a. m. and not a living being—except a dog, who has seen better days, and looks as if the "wool had been long since pulled over his eyes"—is to be met with. Hurrah! I detect a German coffee shop; I enter, mein herr von Deutschland gives me a fraternal salute. In half a minute a smoking "bifteck" and a good cup of coffee were before me—geniune. What an appetite this cold mountain air (7,000 feet) gives me. I eat, I talk, and like the witch who "maunched, and mauched, and mauched," I feel, conscientiously, that my Teutonic friend will make a loss out of the four bite which I pay him for my repast, and ask him to hob-nob a glass of lager at the next saloon.

Here, one by one, enter weird beings, dark, grinning and unctuous, who drink dark lager or pure spirit, and silently look upon me with the disgust with which my stranger-looks evidently inspire them. I cannot tell the reason I am so hateful, but guess it is because they perceive that I am no miner—only a tourist, a worthless individual who has merely come to have a look at them.

I feel like a fish out of water, so say good

bye to my host, and take a walk along the mountain. Such wild scenery I have never before seen. Not a plant, not a tree, not a cabbage. The whole view before me, looks like a vast range of volcanoes; below, the Savage threatens me with a savage mein; the Belcher helices out fumes of noxious gasses. All is still, save the boom of the machinery. Below, there, in fumes of hot, suffocating atmosphere, stripped nearly to the skin, sweating and working, are the inhabitants of this extraordinary region. Who can tell what those subterranean caverns have given rise to in our world's history. What wars, crimes, bloodshed and misery have been worked through their instrumentality? and yet thousands of lives are annually used up in their service.

I cannot help thinking that money is the root of all evil, and that from the pit's mouth it works its fatal charm upon the victims of its malevolence. No quiet homestead, no peaceful valley is to be seen: all is apparently desolation and darkness! I return to the mountain top, and now the town becomes full of life. Hundreds of strangely-dressed people "are congregated in the street." Indians with their squaws, alike wretched, are to be met with in groups, a few buggies, with their owners in rough coats, a few stragglers in the stores and all is seen of Virginia City. I feel glad when the preparatory whistle of the engine shows that it is time for me to get aboard of the train, and my mind through the night wanders in a dreamy mist of ideas through the strange scenes which I have witnessed, but can so imperfectly and faintly describe. In my next I hope to be able to give some observations in regard to the famous mines of this region. But now, Mr. Editor, I must take my leave of you for the present; so good by till next time, and please to remember I owe Wo Sing a washing bill and am "dead broke."

Yours truly, RAMBLER.

The New York Money Market.—Threatened Trouble Ahead.

[Letter from an Occasional Correspondent of the Press.]

DEAR PRESS:—You will find everywhere a set of regular croakers who make it their especial business to go about in the most doleful fashion prophesying wholesale ruin, immediate and unavoidable on all sides. New York is no exception to this rule. New York has its croakers, as has every other important commercial centre. Now, I too am going to put in my croak. Don't condemn me too hastily. Don't associate me with the venerable brotherhood of croakers, as a life member. I am only *in pro tem.*, so to speak.

If I am to have out my croak, it is incumbent on me to show that there are good grounds for it. Perhaps if I prove that I am one of an immense army of croakers, my Cassandra—like assertions may carry more weight.

First, then, who are the chief croakers at present? Not the birds of ill omen who, whenever the market happens to be a little tight, (as between seasons, in the Fall and Spring), augur the speedy realization of their dismal forebodings. Not mere speculators who are on the look-out for a general depreciation of prices on the one hand, or a corner in money on the other; and who hope, by promulgating wild talk, to affect the market as they wish. These two classes of men may be relied upon about as confidently as the Millerites, in the way of this cheerful sort of prophecy. No; it is not from them we should seek trustworthy information. Ask sound business men who are disinterested—or, at least, have nothing to make. These all agree. Notice for yourself the general drift of conversation on the street. Mark the despondent look worn by the business parts of the city. There is but one answer, a single solution: *we are on the verge of great financial trouble.* Already proofs of this grave truth are evident.

If there were no solid ground for fear, the prevailing opinion of things would be enough to cause great difficulty. It takes very little to start a land-slide, when everything is ready. In financial matters it is the apprehension, rather than the reality, that usually does the work. Whenever a considerable number of parties, anticipating a crash, begin to call in loans, mortgages and credits, that crash is precipitated.

But we have not only vague, undefined rumors, but many actual failures. There is great monetary distress at the South—more, perhaps, than at any time since the war. A member of a prominent dry goods house in this city tells me that, out of five hundred accounts kept with Southern jobbers, they have had over twenty bad failures—averaging about thirty cents on the dollar—since the first of January. In every other line of business the same complaint is made. To be sure, the dry goods interest is always the first to suffer, but it is still a pretty accurate barometre for the rest. The weaker banks are going down, right and left. Within a couple of months three in New Orleans; two here; many scattering. And now the Bull's Head Bank, which was in high popular confidence, has to suspend. Naturally enough, the officers do not like to acknowledge this to be the result of simply bad management and throw out mysterious hints about embezzlements. All hosh. From all accounts this

is a good square collapse, if ever there was one.

I have mentioned the prevailing distress at the South as one cause of difficulty here. Another tightening influence, and a most powerful one, is the certainty of a speedy resumption of specie payments. And yet it is not exactly the certainty of resumption—for that all count on—but the uncertainty as to the precise epoch of resumption. If this were definitely settled at (say) three, or even two years, time enough would be allowed for large operators to draw in their horns gradually. The market would, in such case, find its level by degrees, without any very violent commotion when it was voted to resume. But as to the facts of the case, we are liable at any time, from the tone of the last Congress, to specie resumption at short notice. Here we are, in a most woefully patched up state, financially.

Look at the state of the currency. With all the talk about its inflation there have been occasional stringencies; and these have been met by our "Fiducial Providence," (as somebody calls Mr. Bontwell), by tossing overboard a few more millions of paper each time trouble was experienced. Thus we have been going from bad to worse, each temporary relief in reality but aggravating the disease. Actual contraction of some fifteen per cent, is bad enough; I do not know but that I am justified in saying that the dread of it is worse.

After all, perhaps the main cause of the present uncomfortable condition of things is to be found in the unusual mania for stock-speculation. There have been such violent fluctuations in leading stocks that a large number of outsiders have come upon the street. This withdraws from production and legitimate business an enormous amount of capital and indirectly injures the country to an incalculable extent. It is comforting to reflect that of those who venture among the Wall street animals, most come out badly bitten. Everything is compensated for, in this world.

There seems to be but one way of staying off great national distress, and that is Mr. Bontwell's plan of still further inflation. This idea is entirely too homeopathic to suit our old school business men. What we do want is adequate legislation—or, better yet, none at all—and plenty of European capital. Without these all temporary makeshifts are useless and worse than useless. ALBERT WILLIAMS JR.
 New York, March 29, 1873.

An English View of Our Iron Trade.

We copy the following interesting article from the *Colliery Guardian* a journal of the coal and iron trades, published in London:

The iron trade of the United States is clearly acquiring more and more importance day by day. In 1871, the production of pig iron in sundry counties of the great metallurgical State of Pennsylvania was as follows:—Alleghany, 47,618 tons; Armstrong, 26,573 tons; Bedford, 17,055 tons; Berks, 36,971 tons; Blair, 7,078 tons; Cambria, 25,047 tons; Carbon, 25,927 tons; Chester, 18,077 tons; Clarion, 6,041; Columbia, 16,002 tons; Cumberland, 3,567 tons; Dauphin, 25,822 tons; Erie, 8,292 tons; Fulton, 4,912 tons; Fayette, 85 tons; Huntingdon, 1,800 tons; Lancaster, 65,285 tons; Lawrence, 39,805 tons; Lebanon, 59,286 tons; Lehigh, 159,059 tons; Luzerne, 23,211 tons; Mercer, 59,872 tons; Mifflin, 8,557 tons; Montgomery, 71,975 tons; Mouton, 31,333 tons; Northampton, 106,718 tons; Perry, 3,553 tons; Schuylkill, 25,607 tons; Union, 4,231 tons; and York, 4,161 tons; making an aggregate of 923,527 tons. The total production of pig in the United States in 1871 was estimated at 1,900,000 tons. The growing importance of American metallurgy may be illustrated in another form and in other words. In 1854, the annual consumption of rails in the United States was 147,658 tons, of which 339,439 tons were imported, and only 108,016 tons were manufactured in the Great Republic itself. It follows that in 1854, of the total consumption of rails in the United States less than one-third was of American manufacture, while more than two-thirds were imported. In 1872, the consumption of rails in the United States amounted to 1,504,591 tons, of which 975,000 tons were of American manufacture, and 529,591 tons were imported. The old order of things was thus reversed, about two-thirds of the rails used by the Americans last year being made in the United States, while one-third was of American manufacture. American statistics place the imports of foreign rails into the United States in 1872 at 523,591 tons, and British statistics show that British railway iron was exported last year to the Americans to the extent of 472,760 tons, leaving a balance of 50,831 tons derived from other sources. These other sources were Belgium and France.

The general conclusions which may be drawn from the data which we have been summarizing are—first, that American metallurgy has acquired during the last twenty years—and this in spite of the serious national troubles with which the Republic has been afflicted—a very great development; and secondly, that vast as this development has been, it has been outstripped by the still more rapid progress of the American consumption of rails and other descriptions of iron. The vigor which has been displayed in the prosecution of new railroads in the United States during the last four years has been marvellous, and the existing systems have also been improved and extended as they have increased in productivity and importance, so that on all sides there has been a growing and extraordinary consumption of railway iron throughout Brother Jonathan's

vast dominions. Those dominions are, indeed, so vast that one cannot at present discover a limit to the extent to which the work of American railroad construction may be carried, and the price of rails is practically the only consideration which has to be taken into account. If the Americans had only Great Britain to rely upon as regards their rail supplies, the construction of American railroads would probably have now to be, in a great measure, suspended; but American energy has been equal to the occasion, and we have now statistical evidence of the fact that two-thirds of the rails required for American railroads have been made of late in the United States themselves.

The present aspect of the iron question in the United States possesses much interest for the iron trade of Great Britain. So long as the Americans could obtain supplies of rails from this country at a reasonable price, they were content to import them with a certain freedom; but in exact proportion as British rails have risen in price, they have applied themselves with increased energy to the development of their own metallurgical industry. Never at any previous period of their history have the Americans devoted so much energy to the working of American coal and the production of American iron as in 1871 and 1872; and just as coal and iron have become dearer and dearer in Great Britain, so have the working of American coal and the production of American iron been still further stimulated. The result of this new order of things in the United States is reflected in a marked diminution in the American consumption of British railway iron. In the first two months of 1872 we sent the Americans 88,430 tons of our railway iron; in the corresponding period of this year the corresponding exports sank to 48,901 tons,—showing the alarming declension of 39,529 tons. As American orders for British iron are executed to a large extent in Wales, the fact to which we have just called attention possesses an especial interest for that strike-distracted portion of the empire. It may be an unwelcome truth, but it is a truth notwithstanding, that unless the wretched labor disputes, fomented by interested parties, which for so many months past have afflicted the iron trade of this country, can be healed—and healed, too, in good, sober earnest—the bewildering prosperity which appeared to be dawning upon British metallurgy will pass away like a dream; and in districts marvellously endowed by nature, and once resounding with the hum of happy industry, labor will be compelled to fold its idle hands and lament the folly which reduced it to profligate inaction.

Westinghouse Brake on Driving Wheels.

Commenting on an accident in which the locomotive broke loose from the cars after the brakes were put on, the *Pittsburgh Commercial* says:

"The great importance of applying the brakes to drivers, as well as to the cars, has been forcibly demonstrated in the Mifflin accident. In a train of several cars, each car has its proportion of the weight of the locomotive to overcome. This weight is (independent of the tender, which has its own brake,) about thirty-five tons, making a weight of about six tons to be overcome by each car, besides its own weight. This strain is not equally exerted between each car, but is, of course, the full amount between the locomotive and tender, and six tons less to the coupling of the next car, and so on.

"If there was a sudden jerk, it could not have been given by the break, or by reversing the engine. In either of these cases the train would be closed instead of stretched apart.

"There are instances on record of cases where the reverse lever of the locomotive has slipped forward, of its own motion, after having been reversed, and would make a tremendous jerk, sufficient to break any coupling. The fact of the immense strain being applied to the couplings would at first seem to have caused them to break, but it is well known that the strength of the couplings is sufficient to stand several times the amount of strain that would result from the application of the brakes.

"If the engine has been reversed, the strain would have been almost nothing upon the various couplings, as the locomotive would have taken care of fully one-half of its own weight. If the air brakes were applied to the driving wheels of the locomotive, as well as to the other wheels in a train, there would be no strain upon any of the couplings, while the efficiency of the brake would be increased to a great extent.

"The Pennsylvania Railroad has applied the air brake to the drivers of several of their shifting engines, and it is found to be at least twice as efficient in stopping trains as engines are when reversed.

"It seems common sense would suggest that efficient brakes should be put on the locomotive, and thus prevent all strain on car couplings, as well as provide against the locomotive breaking loose and running into the train ahead.

"In the Mifflin case, after the couplings were broken, the engine would lose part of the help of the cars, and so would apparently shoot forward and run into the train ahead; but in reality the train, after being relieved of the weight of the engine, would stop sooner than it otherwise would have done."

MECHANICAL PROGRESS.

Air Power.

A letter from Brunswick, Me., to the *Portland Argus*, gives the following information relating to the use of air as a motive power in that village:

"On the Androscoggin river, some three-fourths of a mile below the railroad station, is the site of a mill, long since burned, and the motive power which operates the condenser is a water wheel at the place. The wheel, it is said, is capable of driving four condensers of equal power with the one now in use. But it is only with results already accomplished, that we have to do. At the railroad station is an engine of ten-horse power, running circular saws for sawing wood and various machinery in the blacksmith shop in the vicinity. Thence a small pipe passes on through the village, furnishing power to Worthing Brothers, jewelers, who are running a small engine of about one-horse power. Parent and Dufriend also use an engine of two-horse power in their blacksmith shop; Dennison & Co., box makers, an engine of two-horse power, and Professor Brackett, of Bowdoin College, one of three-horse power, for the manufacture of instruments, while the laboratory of the college has one of six-horse power. That, nominally, this small condenser furnishes in all twenty-four-horse power, and all unite in saying that the air power is much more efficient than steam in working the same engines; it does not drag, but recovers itself instantly from any strain or check, and is in every way a success."

REMARKS.—The employment of pneumatic power for industrial purposes is constantly increasing. By its use the Mt. Ceniz tunnel, through the Alps, seven miles in length, was bored. The Hoosic tunnel, in Massachusetts, five miles in length, now nearly finished, is being cut by the same means. The St. Gothard tunnel, in Switzerland, lately commenced, which is to be thirteen miles in length, will also be cut by means of compressed air. The Hell Gate rocks, under the East River near New York city, are in process of removal by the same agency. In planing mills, the pneumatic method is used to carry the shaving from the planers to the furnaces of the steam boilers; in grain and wool houses, to convey the stock. At the iron furnaces pneumatic elevators are used to lift the cars and their loads of ore from one point to another. In London the pneumatic method drives five ton freight cars in tubes under ground; the post office department of that city has now in use several miles of pneumatic tubes laid under the streets in which letters are conveyed with great rapidity.

In this country the largest scale on which the system has been applied is at the works of the Pneumatic Transit Company on Broadway, where a railway passenger car, running in a nine foot tunnel under that street, is operated by compressed air. For an underground railway this pneumatic method is especially useful; fumes, gas, smoke, dust, noise and locomotives, all are avoided; the cars may be driven smoothly along with great rapidity. In England, some years ago, during the experimental trials of the pneumatic cars, the trains were driven by this method at a velocity of sixty miles per hour.—*Am. Artizan.*

Novaculite.

Novaculite is usually made use of for the purpose of sharpening tools and domestic implements, and is commonly called whetstone. Geologically, it belongs to the millstone grits. Its first condition undoubtedly was sandstone, and by the aid of a chemical process, performed by nature, became pure silica. A great deposit, from which thousands of tons have been mined for hundreds of years, is situated near Constantinople. There are also two or three other deposits known in Europe, but none of so good a quality as the one at Constantinople. The most remarkable deposit of this kind was found in Arkansas about the year 1840, some two miles from the celebrated Hot Springs. The quarry was first worked in 1843; but only for the past few years to any great extent. The demand is quite extensive, and stones sold at from 50 cents to \$1.25 per pound, ready for use. The vein of rock is very peculiar, presenting twelve to sixteen feet of width, and carrying with it on either side the same rock, but of a much more coarse and inferior quality. The dip of the formation is 40 to 45 degrees, and seems to become more uniform the deeper the vein is mined. The deposit of red oxide of iron, in some portions of the vein, gives to it the appearance of a fine marble. Its discovery was made by its cropping out upon a quite extensive hill owned by a gentleman by the name of Barnea, who holds in this an independent fortune. The finest portion mined brings a large price, and is largely used by engravers. In the Cedar and Taney counties in this State (Missouri) the same rock is found, but no development has determined its extent, save surface specimens, which are not likely to represent the best rocks of the formation; as in the Arkansas mine, the deeper it is mined, the more superior the stone becomes.—*St. Louis Journal of Commerce.*

High Pressure Steam and Compound Engines.

Compound cylinders are supposed to be so adjusted, that the work done in each cylinder equals half the whole work; that is, the expansion in the first cylinder equals the expansion in the second. The difference in cylinder room, it must be noticed, is very much in favor of high pressures, as it diminishes in each case as the pressure increases. Thus the area of piston required at 300 lbs. is only half that required at 20 lbs. pressure in a condensing engine. And it is to be noticed that in the compound engines the necessary increase is much smaller for high pressures than for low pressures. At 20 lbs. the high pressure cylinder has half the area of the low pressure cylinder. Whilst at 300 lbs. it has only about one-twelfth.

Now as regards the strength of the engine. This is the great objection to the use of high rates of expansion. The machinery of an engine to work at 300 lbs. must, only to do the same work, be seven times as strong as that which works at 20 lbs. Here, then, is a fatal objection against the use of steam at high pressures, unless it can be met in some way. This is where the advantage of compound engines comes in: while the pressure in the one increases from 76 to 438, the other increases from 63 to 112. Thus by the use of compound engines the pressure on the piston can be kept quite within reason.

Again—by the use of steam at 100 lbs. we may do with little more than half the coal required for a pressure of 14 lbs. with only three-quarters the cylinder room, and shall only increase the greatest pressure on the piston by about 10 per cent. With 300 lbs. we do with 20 per cent. less coal than at 100 lbs. with two-thirds the cylinder room, and we must increase the strength of the machinery by 40 per cent.

We must look for economy by increasing the ratio of expansion and the use of high pressure steam so far, and only so far, as is necessary for the expansion for engines in which the release takes place at or below the pressure of the atmosphere. There will be advantage in pressures at least up to 120 or 130 lbs. Beyond this it must be a question for experience to decide how high we shall go.

In such engines as use a blast we shall find that there is great economy in using very high pressures of steam, provided the rate of expansion is increased. Thus, in a locomotive in which the blast was fixed at 30 lbs. it would be much more economical to use steam at 200 lbs. and expand four times, than at 100 lbs. and expand twice, and the blast would be much the same.—*Prof. Osborn Reynolds.*

AMERICAN MACHINERY IN EUROPE.—It is a pleasant and noteworthy fact, says the *Boston Commercial Bulletin*, that the demand for machinery of American make of all kinds is growing rapidly in favor in countries which have hitherto looked to England as the only proper source for such appliances. At the present time we send locomotives to Russia and Austria, shoe and leather-working machinery to Switzerland and Mediterranean countries, pulp-reducing machinery to Spain and Portugal, and tailors' shears to England. Besides these there is an ever-increasing demand for agricultural machinery, in which our superiority is acknowledged, and our sowing machines are so far ahead of all others that those of foreign make are seldom or never thought of. Our weed-working machinery, too, is attracting the attention of the Old World, although they have less use for it than we.

INTERESTING AND VALUABLE DISCOVERY.—It is a recent French discovery, that adding a minute quantity of gelatine to a solution of sulphate of copper, prevents the brittleness which copper is said to have that has been deposited by the action of the galvanic battery. The softness and malleability of copper deposited from a solution of a copper salt by electrolysis is increased by increasing the conductivity of the solution. Thus acid added to the bath until it has reached the point when the hydrogen gas is about to be driven off, will hasten the decomposition, and the copper obtained will be soft and pliable. But what gelatine does to produce an effect, or rather why, we do not understand.

IRON VESSELS for the transport of spirits are found to be free from many of the defects of wooden ones, especially such as cause loss. They are made of sheets less than one-tenth of an inch thick, of cylindrical form, about 47 inches long and 32 inches in diameter, with ends slightly convex. The bung is closed by rubber disks, and protected by wood hoops on each side; there are thin iron hoops around each end, and the interior is protected from rusting by a coating of gum or dextrine.

EARLY SAWS.—An English writer says that every one who knows anything about saws, their use, and history, knows that the first saws of which we have any trace or record were thin-backed, so that the cutting edge should work freely; setting out the teeth is of more recent invention. The old saws preserved in the museums show this construction.

CAR WHEELS AND AXLES.—It is stated that 104 patents have been granted in this country upon car axles and wheels having the idea in view, of making car wheels to run independently, as in turning a curve.

THE PRESERVATION OF EXPOSED SHEET-IRON. The direction of the government railroads of the Netherlands has published the results of some experiments in regard to the preservation of sheet-iron used in railroad bridges. From 32 sheets half was cleaned by immersion for 24 hours in dilute hydrochloric acid; they were then neutralized with milk of lime, washed with hot water, and while warm dried and rubbed with oil. The other half was only cleaned mechanically by scratching and brushing. Four of each kind were then equally painted with red lead, with two kinds of a red paint of oxide of iron, and with coal tar. The plates were then exposed to the weather, and examined after three years. The result was, 1. That the red lead had kept perfectly on both kinds of plates, so that it was impossible to say if the chemical cleaning was of any use. 2. That one kind of iron oxide red paint gave better results on the chemically treated plate than on the other; in fact, a result equal to that of the plate painted with red lead, while the other kind of iron oxide red gave not very good results on the plates, when only scratched and brushed. 3. That the coal-tar was considerably worse than the paint, and had even entirely disappeared from those iron sheets which had not been treated chemically, but only cleaned by brushing.

SOLUBLE GLASS IN THE ARTS.—The employment of this substance in the arts is rapidly extending, and it has become indispensable in many industrial branches. It seems to be especially well adapted to the production of cements. When intimately mixed with fine chalk, it is found that a hard cement will be formed in from six to eight hours. With powdered sulphide of antimony a black mass is produced which is susceptible of taking a high polish, and possesses then a superb metallic luster. Fine iron dust gives a gray-black mass of great hardness. Zinc dust gives a gray mass of much hardness, and having a metallic luster. Zinc castings can be readily repaired by its aid.

MEASURING THE INTENSITY OF COLORS.—A new device has been prepared for measuring the intensity of colors, which consists of two pieces of glass, touching at one end, and held apart at the other by a strip of platinum. Upon one of the plates a series of fine lines is engraved; and the intensity of any two colors is determined by comparison of the depth of liquid which it is necessary to add before the lines referred to shall become invisible.

SCIENTIFIC PROGRESS.

Progress in Chemistry.

The university of Leipsic possesses one of the finest and best equipped laboratories in Germany, with no less a person than Professor Kolbe as lecturer on chemistry. Recently a thick octavo volume of nearly 700 pages has been published, giving a detailed account of the original investigations made in that laboratory for the past six years. The results of nearly, or quite, all of this work were published to the world from time to time as each investigation was completed; but the collection of them together in book form impresses us with the magnitude of the work, and shows how much can be accomplished in a single institution. Of course, many of these investigations are the direct product of Professor Kolbe's fertile brain, and equal results cannot be expected everywhere. But some results like these, though fewer in number and of less importance, ought to be produced in a dozen of our highly endowed American institutions, where to-day the dust lies deep on long unused apparatus.

It may be objected that these investigations have neither led to startling discovery, nor brought in much money to the investigator. But science can point out so many occasions where the pursuit of knowledge for her own sake has benefited the world at large, that this charge will not avail much among the thoughtful, and especially among intelligent capitalists and inventors. From the time when Priestley discovered oxygen or Liebig prepared chloroform, to the time when Hoffman discovered the beautiful aniline dyes that bear his name, the most valuable and beneficial chemical inventions have sprung from the study of science for her own sake.

Nature can be compared to the wary heiress, who repels each suitor who, as she thinks, is courting her for her money, and bestows her heart only on the true lover who, ignorant of her wealth, adores her for herself alone; and like the cautious heiress too, she often disguises herself as a pauper to test the devotion of her followers. On the other hand, the fortune seeker, who marries the milliner's apprentice in the expectation that she will turn out a millionaire in disguise, deserves the disappointment; and science often thus disappoints her mercenary followers.—*Scientific American.*

SYNTHESIS OF ACETIC ACID.—M. M. Thenard has communicated to the French Academy an experiment which is an important step in the direct synthesis of organic substances by the re-action of inorganic substances. The passage of the electric current from a Ruhmkorff coil through a mixture of the gases, carbonic acid (CO₂) and proto-carbide of hydrogen (CH₂), creates a colorless fluid, which is simply acetic acid C²O₂.

THE POLAR EXPLORING EXPEDITION.—It appears by all accounts from the extreme north, that the temperature of all seas which bathe the Arctic islands, equally with the temperature of the air, has been very much higher during the past summer than in former years, and this thermometric anomaly has extended to the Orkney Islands and Scotland.

These facts are highly suggestive of the ice-conditions in the circumpolar basin, with which the American, Austrian and other Arctic explorers were probably contending till the long winter of the high north set in, and would seem to fully explain the silence of all the explorers, which has continued unbroken for an unusual length of time. Upon this supposition that the ice-drifts were made unusually large by the great excess of heat, and drifted southward in July, leaving an open sea behind them, Capt. Hall's, and the various other expeditions would doubtless have improved the opportunity to push boldly forward to the highest attainable latitude.

As all the outstanding exploring parties were furnished with boats suited to just such a happy emergency, it is highly probable that one or more of them has progressed toward the Pole beyond the utmost limit ever before reached.

IMPACT OF BALLS.—The deduction from all the experiments is that when the ball is arrested instantly by any obstacle which it cannot at all penetrate, a small portion of the ball—the anterior portion—is raised to a high heat; but that when it penetrates any substance little or no heat is developed. A ball fired so as to strike the anvil in a darkened room, gave off at the instant of impact a quite lively yellowish light, showing that great heat was developed; but it is only a very small portion of the ball which is thus heated. Although the heat of that portion which first comes in contact with the obstacle, and is arrested instantly, may be so great as to produce fusion, and even volatilization, the remaining portions expend a considerable portion of their vis viva in crushing the metal between them and the obstacle; and this latter effect, being mechanical, does not develop heat.—*American Artisan.*

WOOL AND COAL ASHES.—It appears to be a matter of no little surprise, with some, that while the ashes from most woods are highly charged with alkali matters, no such matter is found in the ashes of mineral coal; although we are taught that such coal is derived directly from woody substance. The reason of this is found in the fact that the change from wood to coal is made in the presence of water, by which all the alkaline matter is abstracted by solution; mineral ingredients—chiefly silica—being substituted in place of the alkaline matter, thus adding to the bulk of the ashes, but rendering them useless as a fertilizer, except for the mechanical action which they exert upon clay soils, rendering such soils more loose and friable.

A NEW FUEL.—A manufacturing chemist, Mr. John Sellars, of Birkenhead, England, has invented a novel composition of matter for use in the place of coal, cannel, etc., in the manufacture of illuminating gas. The composition consists of a mixture of sea-weed, sea-grass, sea-rack, or the like, with coal tar, pitch, bitumen, mineral oils, etc., either with or without peat, charcoal, or other carbonaceous matter, which mixed matter is subjected to destructive distillation in retorts. The advantages claimed are more effective separation of the light hydrocarbons; second, increased yield of carburetted hydrogen, and the production of coke particularly valuable in the manufacture of metal-foundries' blacking.

SCIENTIFIC ASSOCIATION.—Next to books on meteorology and cognate sciences the best way of learning these matters is by classes, in which men may combine and interchange their thoughts and observations. The greatest savans find this, and have their geological, botanical, astronomical, royal societies, British and American associations for the advancement of science, and what not, in which all may know what each has done, and each share in the learning of all; for, as iron sharpeneth iron, so a man sharpens the face of his friend.

THE TEMPERATURE ABOVE THE CLOUDS.—M. Tissandier states that in a late balloon ascent from Paris, he reached a height of 6,560 feet above the earth, where, having passed through layers of clouds, he found a bright sunlit sky and a temperature of from 63° to 65° Fah. When descending and re-entering the clouds, which were in a highly electric state, the temperature decreased to 27°, and the balloon was surrounded by small crystals of ice.

VOLATILIZATION OF IRON.—Iron is not volatile, except at very high temperatures, like gold and platinum. Dr. Eisner, director of the Berlin Porcelain Works, has tried the experiment of subjecting a small piece of iron, in an unglazed crucible, to a long-continued exposure to a temperature of over 3,000 per cent., when he was distinctly enabled to recognize minute needles of crystallized iron on the cover of the crucible, the result of vaporization.

TO DETECT COTTON IN SILK FABRICS.—A French Chemist has discovered that a strong solution of chloride of zinc will dissolve all the silk threads from any mixed textile fabric, leaving intact any cotton fibres. The practical value of this preparation for removing stains from cotton goods will be apparent unless it affects the color.

to drill on the ore seam as soon as practicable. Have several streaks, from which fair assays have been made, which looks as if there was a ledge in the vicinity of Raymond & Ely.

Dispatch from the Superintendent dated the 12th inst.: "I shipped yesterday, \$33,000. The twenty-stamp mill with new boilers, will start on Monday."

Dispatch of the 14th says: "The twenty-stamp mill, with boilers, started this morning."

Rye Patch.
The amount of halion received on the 14th was 3 bars, weighing 1,451 ounces. The Superintendent writes that the yield is improving every day, and the yield of ore is daily increasing. Have shipped 10 car loads of ore to Winnemucca to be redressed.

Sierra Nevada.
After the 5th says the result of the last clean-up of tons of ore worked gave halion to the amount of 1,260. Nothing new in mine or mill; everything working smoothly.

After the 12th says the mine prospects about the same last month. The southwest streak holds its size, but not prospect quite so well. The old stopes just about their own. The main north drift from the upraise is starting to-day, that looks as though they would get pay. The other prospecting drifts are being pushed ahead as fast as possible. No ore in any of these drifts yet. The runs splendidly.

Silver Hill.
After the 13th says they started the Bacon mill to-day. Everything is in order and all runs smoothly. Since starting air pump the air in the mine is splendid. Think will make a cessation with the Justice in a few days. Received at the mill to-day 61 tons 1082 pounds of ore from the Silver Hill mines.

MINING SUMMARY.

The following is mostly condensed from journals published in the interior in proximity to the mines mentioned:

California.

AMADOR COUNTY.

JOHNIX-Cor. Amador Ledger, April 12: This mine for the management of Mr. Reese is turning out a large amount of rich ore. On the 500 and 600 ft. levels there is a well defined ledge 48 ft. wide of good paying ore from this immense lode, but a small amount of ore is necessary to keep their mill running. Mr. Henderson is his work thoroughly, and any man might well be proud of the showing he can give in this mine. Their mill under the superintendency of Wm. Hooper is turning out the bullion at the rate of 5 to 10 pounds per day.

Alpine Mines and Mills is running on good pay. This mine will in all probability be a first-class mine when they get down 700 ft. and drift 300 ft. to the east.

Grove mine is down 400 ft., and they are running level east to strike the ledge which they expect to find within 50 ft. of the shaft.

CLAVARAS COUNTY.

OLVERINE-GOOD CLEAN UP-Calaveras Chronicle, April 12: This mine is developing splendidly, promising equal if not eclipses, any other mine in the country. Recent crushing of 141 tons yielded \$2,750—an average output of \$19.50 per ton. But the result of the crushing, valuable as it is, is not a fair test of the quality of the ore. The rock was all obtained in sinking the shaft, and as such is of course, contained a very considerable portion of extraneous matter. Previous crushings of same character of rock—care being taken to separate debris of the mine from the ore—paid \$25 per ton, and there is no question but that the entire ledge will yield fully as well. The shaft is now 300 ft. in depth. Lode showing 3 1/2 ft. wide in the bottom. The work of sinking the shaft is being pushed on as fast as possible, and as soon as practicable stopping will begin.

T. Volviline is fully supplied with the latest approved machinery, and everything connected with the mine is first-class. The mill is capable of crushing 15 tons per day, and as an abundance of rock to keep constantly in motion can now be obtained, the monthly yield of the mine will probably average from \$7,000 to \$8,000 in the future.

ELERANTINO-Calaveras Citizen, April 12: This mine, commonly known as the Scieffard mine, has purchased engine and boiler formerly used at Doak's saw-mill. Mr. Swinge has taken the contract to deliver the same, and the hoisting-works and pump will be started immediately.

Role Center This claim, situated in our town, turning out beyond expectation. A large deposit of cement has been reached, where the gold is visible thick quantities as to dazzle the eyes of the workers.

Wicks.—The Big Mine has sunk its shaft 600 ft., and is now drifting toward the vein at that depth. The mill is running full capacity on rich rock taken from the 500 ft. level, we expect that this valuable mine will march on to wealth, with accelerated speed. The Wicks mine has ground up all of the rock which had on hand, and is now sinking its shaft deeper. The mill is closed for the present, and all of the hands, except six, are discharged, as no more are needed for sinking. As soon as the shaft goes down to the depth of one hundred feet, the mill will start up again, and the usual number of men be employed. The "Sick" never looked better than now.

ERN COUNTY.

MINERA-Havilah Miner, April 12: This Co. is working 16 stamps night and day, and turning out more rock to the mill can crush.

Wicks.—The mine is now perfectly opened, and Mr. Walker & Co. are taking out a large amount of high grade rock, rich in gold sulphurets. The ledge is nearly 8 ft. wide.

DE WALKER.—This mine which has remained idle for undated eighteen months ago, has been bought by Hon. P. T. Colby, who has associated himself with some of the best mining experts of this Coast, E. Q. Burk. These gentlemen have purchased a pump of 100 ft. lifting power and will start at once to take the ore from the mine, after which a large force will commence to extract rock, which will set the 20 stamps running again.

BUZZLEY BEAN MOUNTAIN.—The owners of these newly discovered mines contemplate the erection of an 80-stamp mill at an early day on the industry; the largest of the three Bear ledges. It measures from 5 to 10 ft. from top to wall; runs nearly 3,000 ft. on the surface and give a prospect anywhere.

PAUL.—This new mine, discovered about 2 months ago, is feeding 4 arrastras constantly with what is supposed to be the richest rock taken from the Kern mines this year. (No clean up yet). Good estimates think it will average between \$75 and \$100 per ton.

One of these mines were in operation last year, and can truthfully say that there will be 50 tons of rock shipped in Kern this year where there was one last.

VADIA COUNTY.

MINING AT COLFAX.—Nevada Transcript, April 10: "The prospecting in the vicinity of Colfax are improving. The Rising Star mine, with a five-stamp mill, mining only in day time, after a run of one month, yielded up \$5,200. The mill is now running night and day, and they have a 22-inch ledge, which looks splen-

dilly. The Rising Star never looked better than at the present time."

Big STRIKE.—Nevada Transcript, April 15: We heard a report in town yesterday that a man named Cash was had struck a pocket in Red Hill, near this city, and took out \$2,000 in gold. This was certainly a good cash haul for him.

PLACER COUNTY.

DETROIT FLAT.—Placer Argus, April 12: The business of mining is being pushed vigorously at present, and all the working claims are in full blast. The Placer claims cleaned up for the last run \$2,892.20; the Hume-Ticket, \$2,400; the Pacific, \$7,000; the Emuc-price, \$3,055; the Deep-shaft—not for pay, but for experiment, \$1,170; and the Central, \$4,430. These claims are all owned by the Cedar Creek Co., and each run from 40 to 45 days of 12 hours each, according to miners' estimate, though in fact they ran from 20 to 23 days and nights. From the commencement to the end of a run the water is not shut off except for necessary repairs or unforeseen accident of some nature. Each claim is supplied from the company's ditches with from 500 to 1,000 tubs of water, besides which the company's sales of water for March amount up \$9,363.51, and it is reliably known that the company's net earnings for the month exceed \$16,000. The Summit Company have run and fully completed their tunnel, and are washing an 8-ft. bank, from which they will be able to clean up a most little sum reaching into the thousands.

SAN DIEGO.

PULJING.—San Diego World, April 5: The mine are producing a large quantity of mail about the entire belt or system of auriferous quartz veins, from the Owens to the Golden Chert, a distance of over 8 miles, will convince the most skeptical of our real worth.

The Owens started their new hoisting works to-day, and will probably have their mine clear of water by Friday night, when workmen will commence active operations in sinking and stopping their already opened levels.

The San Diego is being worked steadily. A lot of ore having been worked recently, they paid a profitable dividend to the owners.

The Helvetia has resumed work, an interest having been lately purchased by the irrepressible "Count," who has no doubt made as usual a lucky strike. The Helvetia has been improving steadily as depth is attained. Searching for croppings on the Big Blue Hill has been resumed by several parties, and as usual with good results.

The Good Hope mine has recently struck a fine vein of excellent ore.

The Great Eastern is being worked on a lease and is paying well.

The Hayden is turning out a large quantity of fine ore. In the Canon general activity prevails. The Chaparral, Atlelope, Madden, Pacific, Kentucky, Ready Relief, and other mines are turning out splendidly.

The Golden Chert have their new mill nearly completed, and will commence crushing ore from their mine on Monday next. There are now about 500 tons of ore on the dump, and they are taking out better ore than ever. The company are engaged in running a level to connect with the air shaft at a depth of 120 ft. When that level shall have been completed, they will be able to stoop back to that will furnish at least 5,000 tons of ore.

TUOLUMNE COUNTY.

RICH STRIKE.—Tuolumne "Independent," April 12: Two Italians named Paganini and Rolero have been so lucky as to strike a vein of gold-bearing quartz near Cherokee, which is extremely rich. Our informant says that he has seldom seen richer rock.

GEM.—This quartz lode, located about 1 1/2 miles N. W. of Columbia, was discovered a short time since. It is a good milling vein, about 6 ft. wide, and the rock is easily broken, and is a fine material for prospecting \$12 per ton. The shaft is down on the lode about 60 ft., and the rock improves as they go down. Expect to sink 100 ft. in depth, when they will, if the present prospect holds good, make arrangements to put up a mill and work the mine with energy and system.

PAYS WELL.—Hill & Marshall, brought to town, Monday last, 65 1/2 ounces of amalgam, valued at about \$1,000, crushed by an arrastra from about 30 tons of rock; \$35 per ton is not bad work to have in a vein.

OLIVER GAVEL CLAIM.—This claim, recently purchased by James Tulloch, is at the lower end of Peoria Flat, and running into Table Mountain, and contains about 25 acres, with a depth of gravel from 15 to 20 ft., and prospecting all the way from one to fifty cents to the pan. The claim will be worked with hydraulic, with a fall of about 200 ft.

CONYER.—The quartz vein was discovered and located last fall, and lies one-half mile east of the Laurel Mill, above Cherokee. They have run a tunnel 200 ft., and have just struck the vein, which will average 1 ft. in width. The character of the rock is crystallized, showing decomposed iron, galena sulphurets and gold.

Nevada.

WASHOE.
BELCHER.—Gold Hill News, April 12: Daily yield, 500 tons, from the 1,000, 1,100, 1,200, and 1,300-ft. levels—the last-mentioned level yielding now about 110 tons per day of very fine, rich ore, which is taken out through the Yellow Jacket shaft. The mine is on a level above, about 50 ft. from the Corn Point line is finished, with the exception of a few ft. of timbering at the lower end. The main incline is down 104 ft. below the 1,300-ft. level, and in her rock. The drift north from the 1,200-ft. level is in 218 ft., and the drift south, to connect with it, is in 347 ft.

CHILLAS-POTOMI.—There is but little change in either the looks or daily yield of the different ore producing sections of the mine, and the work is being pushed on as fast as possible. The ore-breasts in the north mine at the first station continue to yield the usual quantities of good ore, keeping the Sapphire mill steadily running. The main west drift at the second station (500 ft. level) is making good progress, the rock in the face blasting well.

CROWN POINT.—Daily yield 600 tons. The 1,300-ft. level is turning out a vast amount of the very best ore, and the 7th floor above the car-track shows unusually rich to gold. The cross-cut east from the 5th floor is in about 50 ft., in splendid ore all the way, and the indications are that the body will prove to be of great width at that point. The drift south at the 1,400-ft. level is progressing well, as is the main incline, which is now down 150 ft. from the top of the shaft.

GOV. VINCENNA.—The main north drift on the 1,157-ft. level from the Gould & Curry shaft is still driven ahead, with no interesting change to report for the week. Sinking the shaft to complete the connection with this drift is making excellent progress.

DANBY.—The work of sinking a new shaft about 1 1/2 miles north of the old works, near the ledge on the Danby ground, is making rapid progress, the shaft being already down 25 ft. The shaft will be sunk 250 ft. and a drift then run for the ledge at this point, which is known to contain pay ore.

GOULD & CURRY.—The main south drift on 1,600-ft. level, to connect with the north drift from the Savage, is making steady progress with no change of interest to note. The north drift from the main east drift on the 1,5 ft. level is still driven ahead, with no developments of material value during the week.

HALE & MONROE.—There has been but little change in the general appearance of the 800-ft. level during the week. The ore-breasts between the 1,400 and 1,600-ft. levels are still working up to the usual average, and the daily yield has decreased to about 40 tons. The main drift south on the 1,700-ft. level is still driven ahead, with no change of material interest to report. The cross-cuts on this level have failed so far to develop any valuable ore bodies.

JULIA.—The main west drift at the 1,000-ft. level has advanced about 2 1/2 ft. during the week, without material change to report. Two new levels, one east and the other west, are commenced in the drift 150 feet south from the main west tunnel. The west cross cut is in 20 ft., still in ledge matter. The east cross-cut is in 10 ft.

JUSTICE.—Some fine ore has been developed in the east drift on the 400-ft. level during the week. Prospecting in other portions of the mine continues as usual, with a small excellent prospects of good developments in a very short time.

KENTUCK.—The prospecting work on the 1,300 ft level has failed, as yet, to disclose any extensive ore bodies. Knickerbocker.—The main drift west is still pressed vigorously ahead, the face in ledge matter, with occasional streaks of ore, some of which give excellent assays and promise good results when the cross-cutting of the ledge shall take place.

OVERMAN.—The main west drift on the 1,000 ft. level is still pushed steadily ahead without change of interest for the week. Both the north and south side drifts are making fine progress. Each of the 3 drifts have made about 25 ft. advance during the week. Preparations are being made to again resume sinking the shaft in a very short time.

SAVAGE.—The main drift north on the 1,600 ft. level, to connect with the south drift from the Gould & Curry, is still making fair progress, with no material change to report. The main drift south on the 1,600 foot level is driven steadily ahead, with no disclosure of value for the week. The ore body in the west cross-cut in this drift has not proved either as rich or extensive as was hoped when it was struck. The other cross-cuts have failed to develop any considerable bodies of ore on this level, as yet. The main south drift on the 1,700 ft. level is still pressed vigorously ahead, with but little change.

SILVER NEVADA.—Daily yield 60 tons of ore, keeping the mill steadily running.

WOONVILLE.—Oms mill, the Rumsdell & Thompson, starting crushing ore from this mine this evening or tomorrow morning, and the Lons mill day after tomorrow. The mine is in fine working condition, being well worked, with \$150,000 of ore on hand.

KENTUCKY.—The prospecting work on the 1,300 ft level of the pump wheel of the pump, bearing a day or two since, the pump is unable to keep the water in the 1,500 ft. level properly reduced, therefore work at that point is stopped for the present. In 2 or 3 days, however, all will be right again and drifting east resumed. At the 1,400 ft. level the company are drifting both north and south in the vein matter from the main east drift, and showing in from the mine 400 ft. north, or 300 ft. from the Confidence line, which has been sunk from the 1,300 ft. level, 130 ft. from the Confidence line is still progressing, but here, as well as at other prospecting points mentioned, nothing more than very good indications.

Montana.

NATIONAL MINING AND EXPLOSION CO.—Rocky Mountain Gazette, April 2: This Co. started up their mill, in Unionville, this morning, with some certainty of long and profitable work since early in January it has been vigorously developing the mine, and also putting mill machinery in better order. The mine now presents a most satisfactory appearance, and within the last week or two its force has steadily augmented to thirty-five men underground, besides the necessary surface hands. Quartz is now being so rapidly stooped out that considerable quantities have to be stowed away in the mine to await the time when the hoisting apparatus can overtake the work, and the quartz-dump is growing large at a rapid rate.

RAPID DIGGINGS NEAR SHERIDAN.—Montanian, April 3: News came in last evening that once again the diggers have been successful in their search for gold. The discoverers are sure that they have opened out what will prove to be a "big thing." The new discovery is said to be bar and hill diggings, and easily worked. A \$20-nugget was picked up on Monday.

Utah.

EMMA.—Salt Lake Tribune, April 9: This mine has been employing a full force of men all through the month, and there is a large amount of ore ready for shipment. The average product has been about 40 tons daily, which compares favorably with the 30 tons of the month. If transportation for the ore could have been obtained. It is reported that another large body of ore has been struck many ft. below the lowest level, of a quality equal to any other yet found, and in quantity greater than the immense body from which such vast quantities have been shipped.

FLAOSR FF.—This mine has been working a large force. The average production during the month has been about 50 tons daily, and it is proposed to increase the same to 100 tons. The mine appears to be as promising as ever. There is a large quantity of ore sacked at the mine, and the ore-house is quite full. Heavy shipments will commence so soon as the roads are in a condition to permit of transportation.

VALLEY.—This mine has a large quantity of ore on hand. The daily production has averaged 15 tons. The mine is working well, and the prospects are all that the owners could wish.

WELLINGTON.—The new discovery reported in our last month's summary has proved to be a large body of high grade ore, unquestionably a continuance of that in the upper levels. The mine has been working steadily, and a contract has been made to deliver 15 tons of ore daily for 60 days. A tunnel is being run to strike the vein 350 ft. below the out-crop. Over 3,000 sacks of ore are ready for shipment.

DAVENPORT.—The tramway belonging to this mine has been thoroughly overhauled, and is now in fine working order, and gives great satisfaction; 75 tons of ore can now be daily shipped by this means. The mine has greatly improved in appearance, and when all the necessary appliances and force are brought to bear, can be made to yield 100 tons daily. The number of workmen has been gradually increased through the month, and about 60 men are now employed. Large quantities of ore are being taken out, and the shipments during the month have been close upon 500 tons.

UTAH WINDSOR MINE CO.—This Co. owning the Halloway, Last Chance and Montezuma and Savage mines, continue a full complement of men, with the same satisfactory results as heretofore. Some 6,000 sacks of ore are stored and ready for shipment.

HOLLOWAY CREEK.—The main shaft is down 100 ft. and the vein is traceable all the way down. Work on a tunnel, to strike the ore at a great depth, is being prosecuted. The width of vein averages from 2 to 5 ft.

STOKER.—An incline shaft is down 180 ft., showing a body of ore all the way of great value. The vein varies in width from 1 to 4 ft.

THE MONTANA MINE.—This mine has been recently sold under an execution for \$11,000. The purchaser was Theo. F. Tracey, Esq., agent of Wells, Fargo & Co.

GLARIATION TUNNEL.—This tunnel is now in upwards of 470 ft. The character of ore has changed for the last 20 ft. it being now soft and decomposed and easily worked. The indications are that a body of ore is in close proximity.

MOMO MINE.—Cor. from Dry Canon to Utah Mining Journal, April 12: The main incline on this mine is now down to the depth of 380 ft., and shows mineral the entire distance run. At present the company are working a force of from 25 to 30 men, and have about 150 tons of ore on hand, in the ore-house, and at the mouth of the canon. This ore is of higher grade, on general average, than any taken from the mines of other sections within the limits of the Territory.

Several hundred thousand dollars are visible to the naked eye of any practical miner, who chances to pass through the mine, and this may account, in a measure, for the lucky owners not being over anxious to sell out.

LUEN MINING DISTRICT.—Salt Lake Tribune, April 12: Teocoma.—On Teocoma Hill are the Rising Sun, Settling Sun, Morning Star, and several other good mines. It is from these mines that Buell obtained his ore to supply his furnace, and the quality of them can be judged from the fact that with one small cupola, and inside of 4 weeks, Buell ran out 185 tons of bullion, that sold for over \$28,000 and this, too, without flux of any kind.

This extraordinary success may be accounted for from the fact that all ores of the Luen District contain a sufficient quantity of soft oxides of iron to answer for flux.

Again, the mines are nearly all located in limestone formations, passing at times into magnesia, or dolomite rock, with now and then traces of harytes (heavy spar) and fluor spar. With these ingredients of course no flux would be needed. The Buell furnace was but one cupola and that a very small one, yet from these ores without a particle of flux, were run out 11 tons in 1 day, valued at about \$165 per ton. There are at least 2,000 tons of this same class of ore now on the dump at the Teocoma mine alone. It is a lead ore, with but little sulphuret (galena) in it, but is mostly a mixture of grey carbonate of iron and small quantities of iron sulphides. These ores, as well as many others in the district, are said to contain the elements of lead. This mine has been extensively worked, and presents at a depth of 200 ft. a very large, regular and even lined fissure vein.

COOPER HILL MINES.—A group (the Elmer, Ironpole, Cherokee, Chortaw, Natchez, Waddell, Eureka, and some others). These are among the first mines discovered in the Luen District, and have been worked since 1859. The Elmer is a lead mine, 40 ft. deep, with a vein 12 ft. wide of solid ore between walls, yet at present mixed with so much earthy substance as to make its average assays very low. Specimens, however, run up to 60 per cent. lead and over \$300 in silver.

CENTRAL PACIFIC MINES.—We pass southward to the Teocoma, and I should state that this upper hill is one of the hills on the main divide of the Luen range of mountains, from which we look down upon and across Salt Lake, and far away over the sage brush valleys of Nevada—we next come to the Central Pacific group of mines, owned by J. D. Andrews & Co. These mines have been extensively worked and present a huge mass of ore on the dump. I cannot state how much, but perhaps a thousand tons or more. The company as well as lead-smelting ores, and assays very high in both. Here I will state that the general formation of the district is that of limestone, at times passing into dolomite, and exhibiting very fair specimens of marble.

There is also, now and then, a streak of scientific porphyry, occasionally a ledge of quartzite, but only a little of this kind there are a few mines in the district that have a quartz gangue, and these are generally chlorides, and carry genuine horn-silver, a very fine specimen of which I brought here with me, but have forgotten the name of the mine from which it was taken. The grade of ores of this district is constantly increasing as the development progresses, especially of such ores as are rich in lead.

BINGHAM CANON.

VEASPAN.—This mine is reported to be opening up beyond expectation, the vein reached being some 4 ft. in width, of very fine grade and exceedingly well defined. Many experienced miners and others well versed in mineralogy have pronounced it to be a true fissure vein.

The Bingham Mining and Smelting Co. This new organization will be of immense importance in developing the placer mines of Bingham Canon, as it proposes to inaugurate a complete system of drainage, with a view of reaching the bed rock. The tunnel is already in 1,100 ft., and on its course will tap some of the best placer mines. By the means now being adopted the company will turn out to be a complete success.

The Mono mine has a shaft down 360 ft., and in the bottom the ore looks better than ever before. The Panacea looks exceedingly well as does the Noyes. The Belle Whitbur, Emporia and Mountain Chief make a favorable showing, and the Dexter, Utah Queen and Miami develop in a manner which shows them to be excellent prospects.

STAMP MILLS.—The Wyoming mill having proven a decided success it has been instrumental in inducing other capital to seek investment in a like channel. A twenty-stamp mill has been ordered for Diamond City. Another mill is in contemplation to be erected on the ground recently purchased by Mr. Hammer. When these new enterprises are completed there will be five stamp mills in the district aggregating about eight stamps.

CAMP FLOYD DISTRICT.—THE QUEEN OF THE WEST MINE.—This mine is reported to be doing finely, and the prospects most encouraging. An 8 ft. vein of yellow chloride has been struck. Ten men are at work and take out 20 tons daily. The width of the vein is said to be 35 ft. with no hanging wall.

New Incorporations.

MAONETA G. M. Co., April 14. Object: To work the ledges in Grass Valley, Cal., known as the Donahue and Ryan Ledges, in Mohawk Hill Extension of the Ophir and Price Hill ledges. Capital stock, \$200,000, in shares of \$100 each. Trustees—David Fry, Benj. Price, J. L. Ramsey, Chas. Beyer, F. G. Donahue.

IRA AND REORA LEWIS CO., M. Co., April 14. Location, Wallapai Mining District, Nevada. Capital stock, \$100,000, in shares of \$100 each. Trustees—F. R. Lewis, A. O. Morse, Wm. H. Smith, I. de St. Marina, John P. Lawson.

JOA QUARTZ MINING CO., April 16. Location: In Mud Springs Mining District, El Dorado county. Capital stock, \$300,000, in shares of \$100. Trustees—B. H. Numan, R. W. Thompson, R. R. Swain, S. W. Backus and A. D. Carpenter.

A COMPANY called the San Lorenzo Fruit Preserving Company has filed its certificate of incorporation in Sacramento, with a capital of \$50,000. This company to dry the surplus fruit produced in the vicinity of San Lorenzo, by means of the Allen Process.

Meetings and Elections.

THE ARIZONA AND UTAH MINING CO., have elected the following Trustees: D. Townsend, J. A. Pritchard, W. H. Sears, H. C. Kibbe and G. W. Fisher. Secretary, Joseph Maguire.

GIANT POWDER CO.—Trustees: Egbert Jndson, Henry Brickwell, A. Block, Geo. C. Bode, Geo. C. Hickox. Subequently, Geo. C. Hickox was chosen President and Henry Pichior, Secretary. The same officers were chosen for the Atlantic Powder Company.

THE MONTANA AND UTAH M. COMPANY.—April 14: Trustees—J. A. Pritchard, M. D. Townsend, W. H. Sears, H. C. Kibbe and G. W. Fisher; President, J. A. Pritchard; Vice-President, H. C. Kibbe; Treasurer, M. D. Townsend; Secretary, J. Maguire. The receipts of the year were \$63,000 (from assessments), and the disbursement \$49,500, leaving a balance of \$13,500 on hand.

CALIFORNIA STOCK EXCHANGE BOARD.—The California Stock Board commenced business in February, 1872, and has since been in active operation. Financially, the enterprise has been a success, and the Board has now in the treasury \$4,000, with no debts. The monthly sales for the year have been as follows: February, \$1,007,048; March, \$831,089; April, \$2,187,809; May, \$1,007,105; June, \$1,071,805; July, \$1,563,240; August, \$1,311,010; September, \$1,044,515; October, \$1,044,515; November, \$1,779,293; December, \$1,770,555; January, 1873, \$1,813,300. Total, \$15,651,196. At the annual meeting held on the 4th inst. the following names were re-elected officers for the ensuing year: President, T. J. L. Smiley; Vice-President, O. L. Weller; Oiler, Joseph Tilden; Secretary, W. W. Lawton; Treasurer, National Gold Bank and Trust Company.—Alta.

Iron and Coal in the North of Europe.

Official reports from Sweden tell of the increasing commercial prosperity of that country, in which prosperity the iron trade largely shares. The total amount of iron of all kinds exported from Sweden to foreign nations during the year 1871 was 214,350 tons, valued at £2,045,704. Of this amount 98,334 tons (worth £882,193) were exported to England; and it is interesting to note, in connection with the iron trade between Sweden and Great Britain, that, according to the official statistics it is one which has of late years gradually increased. The various kinds of iron taken by Great Britain from Sweden bore the following proportion to the whole quantity of each exported:—Pig iron 58 per cent; bar-iron, 43; casting 65; and scrap, 54 per cent. In Sweden the manufacture of railway rails has never been much developed, and it is at the present time limited in extent, its commercial importance being small. There are only two works of any pretensions in operation, and good authorities concur in the opinion that there is a capital field for enterprise in Sweden in respect to the manufacture of these rails. It is believed that the toughness and good quality of Swedish iron render it well adapted to withstand the wear and tear to which rails are necessarily liable. The chief articles of import into Sweden are machinery, coals, etc. Of 22,494,487 cubic feet of coal which entered Sweden last year, 22,000,000 came from England—principally Davison's West Hartley and Cowper Hartley—while the greater part of the remainder was derived from Holland and a small quantity from Belgium and Germany. A good deal of machinery is also imported from England into Sweden, and this is an importation which is constantly increasing.

The discovery of coal in Scandinavia has been the subject of much observation, but it is generally believed that, unless the existing extraordinary high prices are maintained in this country it is not likely to effect the market much—the less so as the quality of the seams hitherto brought to light is inferior to the British article. Seams of coal, according to a Copenhagen correspondent, have been discovered in the south of Sweden, and several companies have been or are being formed to work them. One of the companies commenced operations on 21st January, under the direction of an English engineer. A circulation has been issued by Stockholm capitalists for the formation of a company to work the mines near Engelholm, to the south-west of Scania, where the operations referred to above are being carried on. The capital is fixed at nine millions of Swedish crowns, which has been mostly subscribed. An Anglo-Swedish society has been formed in London to purchase for £190,000, 7,000 acres of coal country in Scania. Borings for coal have also been made in Denmark, but without success. In the Island of Bornholm the precious mineral has been found, but the quality is inferior, and it has not yet been exported. A Dano-German company is being formed to make more extensive experiments. There are coal-beds in Jutland, and the search for new mines is being prosecuted in the island of Faere.

Diving Armor for Miners.

It sometimes happens that mines have to be abandoned and cannot be worked, either because of their filling with water, or on account of the large amount of foul air. To pump out the former, and to expel the latter, may be too expensive, or occasion too long a delay, and, hence, it has been proposed to educate a corps of diving miners to enter, and, if need be, to work such mines. For this purpose, a diving-school has been instituted at a coal mine in Saarbrück, Germany, where strong, healthy men of medium size, are first taught the construction of the armor, how to take it apart, and put it together, how to repair it, and all other details connected with it. They then descend into a large tank, where the water is but twelve or thirteen feet deep, this depth being sufficient to give them practice with the apparatus, and to accustom them to remaining under water. A new beginner, after two or three descensions, acquires sufficient knowledge to enable him to help himself under any circumstance, and is able to remain there half an hour. A squad of seven to nine men work together, and, while one is in the water, a second works the air-pump, a third holds the signal line, a fourth attends to letting out or taking in the hose that supplies air, and so on, each assisting in some way.

Practice with the armor in fire damp and irrespirable gasses, is obtained in tightly closed rooms, filled with gas, steam, and smoke, so that a person not in armor could not remain there at all.

After gaining practice in the shallow basins, they descend into the shaft of a mine, which is nearly 350 feet deep, and filled within eighteen feet of the top with water. At depths of thirty and sixty feet, are permanent stagings, where the diver may stop and rest. At a depth of ten to eighteen feet, almost all experience a peculiar roaring in the ears, or a tickling of the drum of the ear. This disappears as they descend farther, and all feel so comfortable in the water that they are able to stay there several hours without fatigue. While in the mine, the men practice various kinds of work, either in the dark, or by the use of a submarine lantern. Thirty men have already been instructed in the Saarbrück mine, and will be employed principally in drilling others to the same new profession.—*American Artisan.*

Flower Studies.

The attention of nurserymen and florists has been directed of late to the many beautiful shrubs which belong to the Flora of California. One of these, rarely found in gardens, is just passing out of bloom, the *Garrya*—so named by David Douglass, in compliment to a distinguished officer of the Hudson Bay Company. It was regarded as the greatest curiosity sent home by the great botanist and explorer, and the structure of the flower is so unlike anything else in the vegetable world that it forms a natural order all by itself. From a shrub of medium size, somewhat straggling in its growth, with ovate or roundish leathery leaves, there depends early in January long strings of pale silver green blossoms; looking precisely like strings of lilac or jessamine flowers upon a blade of grass. It looks as though nature had made it in some mood of play, and the form had become fixed without her intention. More curious than beautiful, once seen, it will never be forgotten. (See Illustration.)

Highest on the list of flowering shrubs we place *Manzanita*, lovely in name as in form and foliage. There are several species, and all are



THE GARRYA.

desirable additions to ornamental grounds. The evergreen leaves and richly colored stems remind one by a subtle association of the aboriginal inhabitants, who used their berries as food and the wood for many purposes in their simple arts. *Manzanita* is a social shrub, and enjoys having companions of her name and lineage within speaking distance, as you will see if you ever visit the petrified forest near Calistoga, over the ruins of which a family circle of *Manzanita* trees, of all sizes and ages, but with garments cut by an exact pattern, appear to have convened to study out the mystery. On the summits of the Sierra Nevada, where the vegetation is dwarfed by the cold, miniature trees of the *Manzanita* closely resemble the vegetable monstrosities which the Chinese and Japanese create by artificial methods.

Along the cañons the currant gooseberry (*Ribes sanguineum*) hangs pale, pink tassels upon delicate willow stems, and the Moose Wood (*Dirca palustris*) is covered with leaves of freshest green. Its blossoms, tiny yellow bells on leafless boughs, have just faded. This plant shows well the advantages of our climate, for it is now budding in the Alleghanies, and two months hence will open on the edge of the Maine woods.

High up in the chapparal of the foothills the earliest of the *Ceanothus* family is opening its tiny chalice, and filling the air with fra-

grance of lilac and birch, or, as some will have it, of the best green tea. Its racemes of countless flowers, so purely, delicately blue, as to seem more like a deeper atmosphere than anything else, cover the nakedness of rugged spiny branches, and change the chapparal into a haze of lovely color, lasting for many weeks. No single genus gives such beauty to the drapery of the hill as the *Ceanothus*. Varying from purple to pure white, and in season until past midsummer, inhabiting the deep woods and more open spaces, it is our constant, changeless friend. To complete the catalogue of its virtues, let us say that it takes kindly to civilization.

One of our most desirable shrubs is the evergreen cherry (*Cercas ilicifolia*). The leaf is more polished than the English Holly, more delicately carved at the edges, and the habit of this plant quite as massive and compact. It is the best hedge plant for our climate, though of slow growth, for the gophers and squirrels understand its medicinal properties, and wisely let it alone. A hedge of this cherry, growing on Mr. Wheeler's farm, near San Mateo, is the most perfect we have ever seen. It is twelve feet in height, about fifteen years old, and perfectly impenetrable to man or beast. At San Lorenzo it may be seen at the Llewellyn place in great luxuriance.

The *Amelanchier*, commonly called "Shad bush," or June Berry, is distributed through the entire country, from ocean to ocean. It deserves cultivation from its graceful, drooping

The Gold and Silver Yield of Montana.

The following article, from the forthcoming Report of the United States Commissioner of Mining Statistics, has been published in the *Engineering and Mining Journal*:

The collection of the mining statistics of this Territory, for 1872, I have entrusted to Mr. William F. Wheeler, of Helena, Montana, whose extensive acquaintance in the Territory has enabled him to send me detailed estimates of the product, and, considering the means at his command, very full data in regard to the several districts. His estimates of the yield of gold and silver of Montana, for the year 1872, are derived from shipments by express, from purchases made by bankers, brokers and merchants, and from miners and others, who have not shipped by express, and who have given him what they believe to have been the yield of their several mining districts.

Gold shipped by Wells, Fargo & Co. \$3,471,395
Gold from Missoula, by "pack-train," to Walla Walla 200,000
Gold taken out of the country in private hands, overland and down the Missouri 1,500,000
Gold retained in hand by miners for winter expenses 550,000

Total gold \$5,721,395

SILVER.
Refined silver bars shipped by express \$97,944
220 tons base bullion, shipped by wagon by Corinne, value \$500 per ton 110,000
60 tons base bullion, shipped East, via Fort Benton, at \$500 per ton 30,000
410 tons silver ore, shipped by wagon to Corinne, value \$200 per ton 82,000
135 tons of silver ore, shipped East—75 tons via Fort Benton, and 60 tons by wagon to Corinne—value \$200 per ton 27,000
Value of copper ore shipped for assay 5,000

Total coin value \$6,073,339

The foregoing estimate is accompanied with the following certificate from leading citizens of Montana, which refers to the estimate for this previous year also:

The undersigned, citizens of Montana, have examined the data upon which the foregoing estimates are based, and are satisfied that Mr. Wheeler has made a very moderate statement of the gold and silver yield of Montana for the year 1872. We have also examined the report for 1871, and consider his estimate of \$8,050,000, as the yield for that year of gold and silver from the mines of Montana, as very correct.

D. C. Corbin, Cashier of the First National Bank, Helena.

T. H. Kleinschmidt, Assistant Cashier, do.
George W. Fox, of Fox, Lyster & Roe, Bankers.

L. H. Hirschfeldt & Bro., Bankers.
R. E. Fisk, Editor of the Helena Herald.

D. S. Wade, Chief Justice.

I am confident that the above estimate is largely under the actual yield.

S. T. HAUSER, Pres. First Nat. Bank.

*In regard to this item, Mr. Wheeler says: "I have taken the actual shipments by 'express' of gold dust and refined silver bars. But I find by inquiry of the several banks and brokers that they have purchased nearly half a million more than the amount reported shipped by express in the Territory. The contracts of the banks in the Territory with the Express Company begin with May 1, 1872, and end with May 1, 1873. The bankers all say they will be able to fulfill their contracts, as they have four months to make shipments in; therefore, the amount will have to be furnished from the yield of 1872, and I am thus justified in adding that sum to the amount named as the yield for 1872 in my report, which will make the total yield of the Territory for 1872 upwards of \$7,000,000."

[I quote the above statement, without adopting the suggestion, since it seems to me that there would be no fairness in adding the first shipments of 1873, on the ground that they contained product of 1872, to an aggregate which, by the same reasoning, must contain a part of the product of 1871. I have, therefore, retained the original figures, representing simply the shipments of 1872.—R. W. A.]

On this point Mr. Wheeler says: "Towards autumn, after the season's work in our placer mines is done, large numbers of miners go to Utah, Nevada and California, to seek employment for the winter in the numerous silver and gold quartz mines there, and return in the spring to their placer mines here. They generally go in companies of ten to twenty, and carry with them the product of their past summer's work, in order to avoid 'express charges,' which are from two to three per cent, and for mutual protection. The sums they take away are large in the aggregate, and the express company is the least likely to know the amounts, in the case of travelers by the coaches, since the express company assume to charge for all gold carried by passengers in this way. Many passengers in the stages take from \$1,000 to \$5,000 with them secretly, to avoid paying these express charges. I know of one company of miners, who traveled by their own conveyance, and took out last fall \$60,000. I doubt if I have sufficiently estimated the amount thus taken out by a quarter of a million. Much of this gold is sold in Utah, Colorado and California, and is deposited in the mints at Denver and San Francisco, and is not reported as the yield of Montana."

Mr. Wheeler says: "There are, to my own knowledge, more than 3,000 tons of silver ore lying on dumps at the mines, and waiting for purchasers, or for spring to permit shipments, etc., of which I have made no account. This cannot properly be included, the value being uncertain, and the amount, whatever it is, is sure to find a place in the aggregate for a succeeding year."

RICH SPECIMENS.—Frank Helling, of Gold Mountain, a few days since exhibited to us one or two of the finest specimens of gold ore that we have seen for many a day. They were selected pieces from the Golden Leaf, a claim belonging to Roth, Smith & Helling, and were literally loaded with lumps and flakes of gold. The ledge is from 2½ to 3 feet in width, all the ore being of a very high grade. It is stated that the Manhattan Company of Austin under the Presidency of Mr. Taylor, are about to build a mill at a point some two miles from the principal mines, where water can be readily obtained by sinking.—*Inyo Independent.*

habit and early bloom, though less valued by us than it is by our friends in the Eastern States, as a harbinger of spring.—*Illustrated Press for March.*

STOCKHOLDERS AS CREDITORS.—An important point arising out of the bankruptcy of the Kearsarge Mining Company has gone before three tribunals; and before all three, judgments have been rendered in one way. The Treasurer and Superintendent of the Company are large stockholders, and they presented claims for money advanced by them. The question was, whether they should rank as ordinary creditors or should have their claims postponed to those of other creditors who are not stockholders. Successively, Register Clarke, Judge Hoffman and Judge Sawyer have affirmed that a stockholder who is a creditor can share coördinarily with other creditors in the distribution of the assets.—*Call.*

The Blue Mountain Coal Company have received a lot of implements for constructing a railroad from the Coquille river to the navigable waters of Coos Bay. The length of the road is eight miles. The company intend to have the road in running order this summer.

A VALUABLE deposit of copper has just been discovered in Montana. The ore is described as very rich and remarkably abundant.

USEFUL INFORMATION.

Magic Paintings.

It is a fact well known to chemists that many salts undergo change of color when heated. Sometimes this is due to the loss of water, at others, it is due to a change in the molecular condition of the surface.

The red sulphide of mercury, known as cinnabar, turns black when heated, and its original color returns on cooling. For this reason, it has been proposed to use it for painting journals and journal boxes, not easily accessible, but in plain sight. The change of color would indicate a "hot box."

The salts of cobalt are so sensitive to slight changes of temperature that they have long been used as sympathetic inks. By writing on white paper with a dilute solution of chloride of cobalt, the writing is invisible until the paper is warmed.

The beautiful red iodide of mercury becomes yellow when heated; the yellow iodide of silver and mercury becomes orange red; and the scarlet red iodide of copper and mercury turns a deep black. By judicious selection and arrangement of these colors very striking effects are produced on warming. A bunch of half-ripe blackberries, for example, if painted red, instantly ripen to a deep black; red roses become yellow, and yellow lemons turn into deep colored oranges.

A winter landscape may be painted in such a manner, that, when warmed, it is converted into a summer landscape. The white sky, painted with chloride of cobalt, becomes blue when heated; the grass and foliage on the trees are palated with chloride of cobalt and nickel, which turns green when heated; the berries and red flowers are colored with dilute nitrate of cobalt solution, and appear red when heated; for the blue flowers, a solution of pure acetate of cobalt is employed. The outlines of the picture, as well as those objects, which, like houses, trunks, and branches of trees, etc., are to remain of one constant color, are painted with the ordinary water colors.

How Gas was First Introduced.—It is now sixty-six years since Pall Mall, London, was lighted with gas—the first street of any city so illuminated. The idea of using carburetted hydrogen gas for purposes of illumination first occurred to Wm. Murdoch, Ayrshire, Scotland. He made his first experiments in 1792, and six years later he succeeded in lighting up the engineering works of Watts & Boulton, at Birmingham. Murdoch was a sagacious man, worthy to be associated with Watt. The merit of bringing gas light to London, however, he loans to a German named Winsor. He was an enthusiast, and employed all the arts of quackery and fanaticism to convince the benighted Londoners of the merits of his scheme. Sir Walter Scott did not believe in this German genius, and actually called him a madman; and even the liberal mind of Sir Humphrey Davy failed to take in the idea that gas was applicable to purposes of lighting houses and streets. Winsor, however, stuck to his business; he won supporters; and one night a long line of streets litized out in a burst of gas lamps, much to the astonishment and admiration of the citizens. After such a demonstration, the promoters were no longer considered idiots. It is calculated that \$100,000,000 are now invested in gas manufactures in Great Britain.

NEW METHOD OF MAKING HYDROGEN GAS.—We have to report the invention of making hydrogen, invented by Gifford of Paris, and claimed to be so cheap as to cost only 10 to 30 cts. per thousand cubic feet, therefore less than one tenth of our common coal gas. The *modus operandi* is not given, and therefore it is impossible to verify the statement in regard to the expense. But if it is true, it will no doubt create a revolution not only in gas matters, but in the cooking of food, in metallurgy, in the working of metals, and especially those of a refractory kind, as platinum and others. In the method now referred to, the gas is said to be produced by a very rapid decomposition of water, and we are anxiously awaiting the details.

AMOUNT OF WATER IN THE ATMOSPHERE.—Did you ever think how much water is in the air, floating unseen? It generally amounts to nearly three gallons above each foot of the earth's surface, and often much more. As new vapor is always rising, the amount of rain that falls during a year is very large. At one place in the Himalaya mountains as many as three hundred inches deep fall in twelve months, or enough if it all fell at once to cover the land with water twenty-five feet deep. In San Francisco thirty-five to forty-three inches fall annually. In the Sierra Nevada the annual fall is from five to six feet.

TO DETECT ADULTERATION IN INDIA-RUBBER.—One criterion for good rubber has been that it would float on water, its specific gravity being .985. The addition of any mineral adulteration, of course, renders it heavier than water, and it sinks; but, recently, cork has been introduced as an adulteration, and, as it injures quality, without increasing its weight, specific gravity becomes an insufficient test of quality. In some specimens examined at a chemical works in Stolberg, forty to fifty per cent. of mineral constituents were found, and to these were attributed the fact that india-rubber finds less use in the arts than might be expected.

East Indian Method of Cleaning Silver.

The Boston Journal of Chemistry, gives the following interesting account of the way in which the natives of East India clean silver articles.

The East Indian jewelers never touch silverware with any abrasive substance. For all articles of the kind, even the most delicate, the method of cleaning they adopt is as follows: Cut some juicy lemons in slices; with these rub any large silver or plated article briskly, and leave it hidden by the slices in a pan for a few hours. For delicate jewelry, the Indians cut a large lime nearly in half, and insert the ornament; they then close up the halves tightly, and put it away for a few hours. The articles are then to be removed, rinsed in two or three waters, and consigned to a sancepan of nearly boiling soapuds, well stirred about, taken out, again brushed, rinsed, and finally dried on a metal plate over hot water, finishing the process by a little rub of wash-leather (if smooth work). For very old, neglected, or corroded silver, dip the article, with a slow stirring motion, in a rather weak solution of cyanide potass.; but this process requires care and practice as it is by dissolving off the dirty silver you obtain the effect. Green tamarind pods (oxalate of potash) are greater detergents of gold and silver articles than lemons, and are much more employed by the artisan for removal of oxides and fire-marks.

A Perfect Waterproof.

A writer in an English paper says: By the way, speaking of waterproofs, I think I can give travelers a valuable hint or two. For many years I have worn india-rubber waterproofs, but will buy no more, for I have learned that good Scottish tweed can be made entirely impervious to rain, and, moreover, I have learned how to make it so; and, for the benefit of your readers, I will give the recipe:

In a bucket of soft water, put half a pound of sugar of lead, and half a pound of powdered alum; stir this at intervals, until it becomes clear, then pour it off into another bucket, and put the garment therein, and let it be in for twenty-four hours, and then hang it up to dry without ringing it. Two of my party—a lady and gentleman—have worn garments thus treated in the wildest storms of wind and rain, without getting wet. The rain hangs upon the cloth in globules. In short, they were really waterproof. The gentleman, a fortnight ago, walked nine miles in a storm of rain and wind, such as you rarely see in the South; and, when he slipped off his overcoat, his underwear was as dry as when he put them on. This is, I think, a secret worth knowing; for cloth, it can be made to keep out wet, in every way, better than what we know as most waterproofs.

KILLING ANIMALS WITH CHLOROFORM.—Many persons would be glad to know how to kill an animal without suffering, and we venture to give this benefit of our experience. We are constantly called upon to destroy horses, dogs and cats, and have little difficulty in doing it. For horses we use a large sponge, say six inches in diameter, thoroughly saturated with chloroform, which is dropped into a bag, large enough to be drawn over the horse's nose. It is not desirable to have the bag "air-tight;" for, if so, suffocation is likely to ensue. In two or three minutes the horse is unconscious, and in eight or ten minutes dead, without suffering. For dogs and cats, a similar process, using a small sponge and bag; or these animals, with the saturated sponge, may be put in a box admitting some air, when they soon "go to sleep." Seventy-five cents worth of chloroform will kill a horse, and twenty-five cents a dog or cat. If one saturation of the sponge does not complete the work, repeat it.—*Our Dumb Animals.*

ARTIFICIAL ORGANISMS.—The researches and experiments into the artificial formation of organic substances are being pursued by many original experimenters, with most encouraging success, and bid fair at an early day to reach a much greater practical value than has yet been realized. Although the methods adopted by the chemist in their artificial compounds are different from those which Nature employs; there can be but little doubt that the forces brought into requisition in both cases are identical. The conditions, however, under which the two operators work, are widely different. There is evidently a wide field for important research in this direction.

FLIES have immovable eyes. They stand out from the head like half an apple, exceedingly prominent. Instead of being smooth hemispheres, they have an immense number of facets, resembling old-fashioned glass watch seals, each one directing the light directly to the optic retina. That explains why they cannot be approached in any direction without seeing what is coming.

A CHEAP AND HARMLESS HAIR DYE may be made of the extract from the green epicarpium of walnuts. The effect of the juice of this substance in blackening the skin is well known. It is perfectly harmless in its effect on the skin or scalp.

GOOD HEALTH.

Health of Women.

Farmers' wives are not as healthy and red-cheeked as city people suppose them to be. In a journey of a hundred miles, you may see a few rosy, bright-eyed, happy women; but, as a rule from Maine to California, care-worn faces, sunken eyes and compressed lips, tell pitiful tales of disturbed rest, of weariness and suffering. We do not attribute this to the tyranny of husbands. We have yet to see the man who does not pity his sick wife.

It cannot always be attributed to the tyranny of fashion, thousands of those suffering women do not read fashion-books. We do not propose to point out all the causes that operate so destructively, but will attract attention to a few not generally attended to by patients and physicians.

We speak of women who at marriage gave promise of a vigorous, healthy life, but as the years passed, their hopes faded like the haseless fabric of dreams.

Asking questions, and closely observing their habits, we learn that very soon after marriage the regular bath was omitted. "I knew it would refresh me, but it was not convenient. I had company, or was tired; and put it off from time to time, until the bath ceased to be a regular habit, and is now only the occasional luxury." The result was, the waste matter, that should have been passed off by the skin, had to be carried along, to be cast out by the kidneys and bowels; or was retained in the blood, loading the breath with impurities and finally clogging the liver.

Here, we have, through neglect of the bath, overworked kidneys, constipated bowels, and a torpid or tired liver. The vital forces ever working to preserve life, and the machinery of life, tossed out flags of distress. Yellow flags, over tongue, skin and eyes; and finally took away relish for food. The wise woman would have "abstained from food" and exhausted labor, and would have taken a thorough rubbing, scrubbing, sweating-bath, to open the pores. Before going in and while in, and after coming out of the bath, copious drinking of water to wash the blood would have assisted the vital forces to go on with the cleansing processes.

"How?"

In this way: Water is very rapidly absorbed, or taken into the circulation. Then, to speak very plainly, it dissolves dirt; and through the skin, kidneys or bowels floats it out of the body.

Every particle of worn-out matter, salts, or medicines, dissolved and carried through the natural channels, by so much relieve the tired liver; when rested it will resume work without spurs or whips of any kind.

Sick women have not thus reasoned; have not thus been obedient to the Divinely appointed law of cleanliness.—*Science of Health.*

Curing Without Medicine.

What is disease, let us ask again, that it should or should not be cured? This solution of the question underlies all argument, all theory, and all practice. It involves the truth or falsity of every medical system. Those of our readers who patiently and carefully follow the series of articles appearing monthly in our columns to its conclusion, will have all the data before them by which to settle this vitally important question, which have accrued from two thousand years of assiduous study and experimentation. We hope and trust that the testimony will be conclusive in establishing the right system, whatever that may be.

Meanwhile, as an aid to the study of this problem, as well as a key to its solution, let us take the simplest illustration possible. Give a well person an "operative dose" of medicine, no matter what. It may be a compound of Bergh's and Bonner's remedies for "hippohorrea"—tincture of iron, Jamaica rum tartar emetic and nitre. In an hour or two the person will be sick. He will experience nausea of the stomach, griping of the bowels, dizziness, headache, debility, and perhaps vomiting and purging. The disease is the effect of the medicine. It is the effort of the system to expel the medicine. Is this effort to be cured, or is the patient to be cured? Clearly the effort, the disease should rather be promoted than suppressed, that the drugs may be removed from the organic domain. The true medication is to regulate the effort so that it will be successful in its work of purification. To cure it with more drugs is simply warring on vitality adding insult to injury.—*Science of Health.*

MILK AS A MEDICINE.—An interesting article recently appeared in the London Milk Journal, concerning the value of milk as a remedial agent in certain diseases. Several physicians of high standing regard it as a specific for diarrhoea, dysentery, and incipient cholera. The milk should not be boiled, but heated sufficiently to be agreeably warm. It is also recommended as of great value in typhoid fevers—as cooling and nourishing, and as promoting sleep.

AVOID FERMENTED FOOD.—Fermentation of food should always be guarded against as the warm weather approaches. Cooked vegetables, fruits, beans, etc., when set away are very liable to ferment. Instead of warming up cold messes, thoroughly scald them. Much sickness is caused by eating stale food.

MISCELLANEOUS.

Cleaning Feathers.

How shall we renovate old feathers, and also clean old ticks? This inquiry I have seen in the papers. My way is this: When the weather portends a heavy shower of rain, I lay the feather tick on clean grass, or in some other suitable position, and smooth it over evenly. One-half hour's heavy rain will clean one side of a badly soiled tick, unless there be greasy spots. In this case I take a pail of hot suds, pour it on the spots, brush them, and let the rain rinse it out. I then turn it over and serve the other side the same. If the shower should be of short duration, I put the bed out in the next rain.

To dry the bed, lay up the tick on slat work, clean rails, or something of the kind. If the feathers are much wet, so much the better. When drying, shake up, beat with light rods, pick up lumps if there be any. When the bed is dry, the tick will be clean, and the feathers almost as good as new. Some of our beds have been used thirty years. I have lain them in the rain every summer; they are now clean and good. It takes but a short time to dry the bed, but when it is dry to appearance, it is not at all fit to sleep on, but should be laid on an empty bedstead, a month or more, with the windows up. This caution may be unnecessary, as no wise head sleeps on feathers in the summer.

As for the labor, I had rather clean five beds in the rain than one in the way generally recommended—that is by poring the feathers from the tick on a sheet in an empty room (when there is no empty room in the house), washing the tick, stirring up the feathers thoroughly, returning to the tick, and laying in the sun for several days, turning and beating up often.—*M. D. E., in Western Rural.*

COOKING VEGETABLES.—Why should vegetables be washed in warm water first, then cold, to clean them from the sand and insects? The hot water, which must be hotter than tepid, causes the insects and sand to fall out at once.

Insects do not always dislike cold water and salt, but hot water kills them.

It must be understood that only a small handful of greens or one head or cabbage at a time must be washed, and then instantly thrown into cold water, which crisps and thoroughly cleanses them. Spinich, leeks, celery and asakale, are thus rendered very clean, and, moreover, are very rapidly cleansed.

It is worse than useless to attempt to cleanse vegetables in salt and water. The hardness which salt creates in the water prevents all cleansing properties. The salt may kill the insects (it does not always do this), but they stick on hard and fast; the hot water makes them fall out at once, and the cold water crisps and also bleaches the vegetables.—*Mrs. Warren.*

COOKING PEAS.—No vegetable depends more for its excellence upon good cooking than peas. Have them freshly gathered and shelled, but never wash them. If they are not perfectly clean, roll them in a dry cloth; but this is seldom required, and then only through carelessness. Pour them into the dry cooking dish, and put as much salt over them as is required; then pour on boiling water enough to cover them; boil them fifteen minutes if they are young; no pea is fit to cook which requires more than half an hour's boiling. When done, put to a quart of peas three tablespoonfuls of butter, and pepper to your taste. Put all the water to them in which they were boiled. The great mistakes in cooking peas are in cooking too long, and in deluging them with water.

RANK FLAVOR IN MUTTON.—A correspondent of the Rural New Yorker, writing from New Mexico, suggests that the rank flavor in mutton may not be due either to the wool or the entrails; but possibly to the breed, management, and more particularly to the feed of the sheep. Mutton, particularly in the summer months, is used extensively in New Mexico as an article of food, and is free from rank flavor, though hatched in the usual way; and it tastes no more like that of the East, than Buffalo does like short-horn beef.

We may say the same of California raised mutton.

LEMON CHEESE CAKE.—A quarter of a pound of butter, a quarter of a pound of sugar, a wine glass of milk or cream, two ounces of sponge cake, three eggs, the grated rind of one and juice of half a lemon; slice the cake and pour over it the milk or cream; beat the butter and sugar together, and stir into it; mash the sponge cake very fine, and add to the above; grate the yellow rind, and squeeze the juice of half a lemon and stir in. Cover the pie plates with paste, fill with the mixture, and bake in a moderately hot oven.

AN ARTIFICIAL OYSTER.—Where will the genius of the American inventor end? A down east journal informs us that a Maine man is about to apply for a patent for an artificial oyster made out of flour paste, tapioca, salt and water. The inventor places these in second hand oyster shells which are carefully glued around the edges; and when a half intoxicated customer calls for a dozen raw on the half shell, he gets them fresh from the shop.



W. B. EWER..... SENIOR EDITOR

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San Francisco:

Saturday Morning, April 19, 1873.

Legal Tender Rates.—S. F., Thurs., April 17—buying 86; selling 87.

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LABOR SCHOOLS.—As we go to press, a meeting of the gentlemen selected by the Mechanics' State Council, to organize a Deliberative Assembly, is being held. They will effect an organization and elect an Executive Assembly. The question of labor schools is a very important one, and discussions of the subject by the gentlemen selected will be a great benefit.

COPPER.—Five or six copper ledges are reported as discovered on Church Island, in the midst of Salt Lake. Assays run up to 42 per cent. There is considerable excitement in mining circles.

PATENT EXTENSION.—The commissioner of patents has granted the application for the extension of a patent to Francis and John Stock, of San José, Santa Clara County, for pump boxes.

TR. in large quantities, is said to have been found at Walla-Walla. A dispatch from Portland, Oregon, states that twenty-six pounds of metal have been brought in.

CHINESE LABOR IN MINES.—It is stated that the Reed quicksilver mine in Napa County is employing a gang of Chinamen as miners, discharging whites in order to do so.

RICH.—It is stated that "49-diggings" have been found at Duck Creek, Montana, and there is a rush there from Diamond City and elsewhere.

THE PROCE Record, one of our most valued interior exchanges, has come to us in an improved and enlarged form.

COAL has been found on the ranch of Thomas Guinean, in Napa Co. The mine promises to be valuable, the deposit being large.

In the coal mines of Amador a vein of coal twelve feet in thickness has been struck in an incline lately run in the ridge between Lone and Jackson valleys.

Decisions of Interest to Miners.

In the issue of the MINING AND SCIENTIFIC PRESS of the 5th inst., we gave the recent Act of Congress which extended the time for the first annual expenditure on claims located prior to the passage of the Act of May 10th 1872, to June 10th, 1874, and now have several other matters of interest to the mining community. The first is a rather interesting and important question coming before the Commissioner of the General Land Office from the Carson City Land Office, which was decided on the 11th inst. The Dardanelles Mining Company having applied for a patent for certain mining property alleged to be a continuation of the Bosphorus lode, the Overman Company made an adverse claim to the same mine as a continuation of the Comstock lode. The Dardanelles Company moved to dismiss this adverse claim, and Commissioner Drummond now decides the motion cannot be granted, holding that there is no law or instructions of the department authorizing such motions to be made or granted; that the only mode of bringing a matter of this kind before the General Land Office is to take an appeal from the decision of the Register and Receiver when made.

Another decision of the Commissioner of the General Land Office is of interest as showing that the provisions of the law of May 10th, 1872, are to be strictly adhered to. The case is in reference to the Lady Morehead mine in Little Cottonwood Cañon, Utah. The title of the case is A. G. Paddock vs. John P. Taggart. Paddock's adverse claim to the mine, as a continuation of the Elmer lode, was rejected by the Commissioner on the ground that no survey had been made of the Elmer claim within the sixty days required by law.

It will be remembered that the Mining Law states that after application for patent has been made, the notices posted, etc., the Register of the Land Office, upon the filing of the application, plat, field-notes, notices and affidavits, shall publish a notice of the application for the period of 60 days in the newspaper which is published nearest to the particular claim. The claimant at the time of filing this application or at any time thereafter, within the 60 days of the publication, must file with the United States Surveyor General a certificate that \$500 worth of work has been done upon the claim; that the plat is correct, with a description accurate enough to identify the claim, etc. At the expiration of the 60 days of publication he must file his affidavit that the plat and notice have been posted in a conspicuous place on the claim during said publication. If no adverse claim is filed during the 60 days of publication the patent is granted, on proper payment. The importance of attending to these details in the matter of location, labor and expenditure, is illustrated by this decision, and will be readily perceived when it is understood that a failure to give the subject proper attention, may invalidate the claim.

It has been also decided by the Commissioner that borax deposits may be located under the provisions of the new law, and as considerable interest is being taken in mining and prospecting for this substance it is well to bear in mind the restrictions as to the size of locations, which come under the provisions of the sections referring to placer claims. The twelfth section of the Act of July 9th, 1870, provides that no location of a placer claim shall hereafter exceed 160 acres for any one person, or association of persons, which location shall conform to U. S. Survey. The tenth section of the Act of May 10th, 1872, (the new law) provides that all placer claims hereafter located, shall conform as near as practicable to the United States system of Land Surveys, and no such locations shall include more than 20 acres for each individual claimant. The Commissioner's construction put upon these two sections is as follows:

The foregoing provisions of law are construed to mean that after the 9th day of July, 1870, no location of a placer claim can be made to exceed one hundred and sixty acres, whatever may be the number of locators associated together, or whatever the local regulations of the district may allow; and that from and after the passage of said Act of May 10, 1872, no location made by an individual can exceed twenty acres, and no location made by an association of individuals can exceed one hundred and sixty acres, which location of one hundred and sixty acres cannot be made by a less number than eight bona fide locators, but that whether as much as twenty acres can be located by an individual, or one hundred and sixty acres by an association, depends entirely upon the mining regulations in force in the respective districts at the date of the location; it being held that such mining regulations are in no way enlarged by said acts of Congress, but remain intact and in full force with regard to the size of locations, in so far as they do not permit locations

in excess of the limits fixed by Congress, but that where such regulations permit locations in excess of the max mums fixed by Congress as aforesaid, they are restricted accordingly.

A case is now pending on appeal before the Secretary of the Interior which is of great interest to miners, especially to those who are occupants of grounds on sixteenth and thirty sixth sections. A dispatch from Washington to the *Call* gives the substance of the whole matter. It appears that unusual professional and lobby influences are being brought to bear on the Secretary of the Interior, in the important case of the Keystone Consolidated Mining Company, the Original Amador Mining Company, the Bunker Hill Quartz Company, and the town site of Amador against the State of California. The purpose is to secure a reversal of the decision of the General Land Office so as to turn over to A. H. Rose and his associates property worth millions of dollars for which the nominal sum of \$400, was partly paid by Henry Casey, the alleged grantee from the State.

The case, according to the *Call's* dispatches, involves extraordinary features of apparent fraud, as well as a principle of utmost importance to thousands of mine owners. The mines in controversy are situated on the mother lode of California, and have been worked since 1850. A dozen years ago, Rose sold for \$130,000 the Keystone mine, which he now seeks to recover in the name of Casey and the town of Amador.

The town was founded in 1850. Its site and all these mines are situated upon the east half of section 36, township 7 north, range 10 east, Mount Diablo meridian. In 1870 certain parties procured a United States survey of that township, and it is alleged that they induced the Deputy Surveyor, by fraudulent field notes, to represent the mines and town as located upon the west half of the section. The purpose was to deceive the occupants, so as to induce them to apply for the wrong tract, while the speculators could, without opposition, purchase from the State for \$400 and receive a patent for the tract on which these properties are actually located. The fraud was discovered and exposed by abundant proofs, demonstrating unquestionably the surveyor's infidelity in returning as agricultural land the richest half section of mineral land ever discovered.

The patents having been issued, the bona fide mining claimants and town authorities immediately applied to the Land Department for patents under the mineral and town site laws, but the would-be purchaser from the State then boldly claimed that the School Land Act of March 3d, 1853, was a grant, in *presente*, of both the surveyed and unsurveyed and both the mineral and agricultural lands comprised in the sixteenth and thirty-sixth sections of every township and consequently that the mineral lands in controversy, situated in the thirty-sixth section, passed to the State immediately on the passage of the Act of 1853.

To this it is replied that mineral lands were excluded from the grant to the State; that the State title did not rest in any lands until surveyed, there being prior thereto no sections sixteen and thirty-six; that the Act of 1853 provided as to mineral lands; only township lines should be the rule, which provision was not repealed until July 9, 1870; that it was competent for Congress, before vested interests had been attached, to make a different appropriation of the lands; that before the survey, Congress did, by Act of July 26, 1866, make a different appropriation of the mineral lands. That if this were so, yet the particular tract in controversy was expressly excepted from the State grant, by the seventh section of the Act of 1853, by reason of its settlement and the erection of dwelling-houses there prior to the survey.

The local land officers and the Commissioner of the General Land Office decided against the pretensions of the private claimants, who use the State's name, and the case is now pending on appeal before the Secretary of the Interior.

The danger grows out of the fact that the Supreme Court of California has decided that the Act of 1853 did vest title to all sixteenth and thirty-sixth sections in the State prior to their survey; and though it is believed that the Court will grant a rehearing and reverse that decision, its action nevertheless lends color and support to the attempt now making to obtain possession of the Amador mines, and to establish a principle fraught with immense danger to thousands of other interests.

Several well known California lawyers are in Washington to assist in the prosecution. It is probable that dilatory tactics will be employed to postpone a decision on this tainted claim until the Benjamin Selling case from the Marysville District can be presented to the Secretary for a decision of the naked question of the right of the State to the sixteenth and thirty-sixth sections of mineral lands; so that if the right of the State is affirmed, it will be comparatively easy to find a pretext for deciding Rose's case in his favor.

The question has a vital importance to all mineral occupants of sixteenth and thirty-sixth sections. If the mineral claimants in either the Keystone or the Selling cases are defeated, then all mines upon similarly numbered subdivisions or which, upon future survey, may prove to be so numbered, are at the mercy of the first applicant to purchase from the State at \$1.25 per acre.

It is represented in Washington that the parties who initiated this speculation have already taken the requisite steps to file first applications for all similar sections throughout the State of California. The same dangers threaten mining occupants in every other mineral State.

"The Geology of the Stars."

The above sentence, which is the title of a little pamphlet before us, is eminently suggestive, and could not possibly have been thus used with propriety, until within the past ten or fifteen years. The telescope long since gave us a very correct idea of the grandeur and immensity of space, and of the fact that it was occupied by an innumerable number of suns and worlds, more or less resembling our own.

The researches of the geologist and the chemist have given us a very correct idea of composition and geology of the globs which we inhabit. Aided by such researches, improved telescopes have also been able to show that the moon is made up of elements similar in appearance, at least, to what we find on this earth, and that its surface is divided into valleys, plains and mountains. But what of the sun and what of the stars? The telescope fails to satisfy our enquiry as to them. True, the former appears to the telescopic view to be a vast globe of fire; but as to what supports that combustion or what may be the elements composing the sun and stars, it tells us nothing—and any such thing as a study of the "geology of the stars" has until quite recently been considered utterly beyond human power—one of the mysteries of nature, closed forever to the knowledge of man.

Such was the condition of astronomical science, when, that most wonderful of all scientific instruments—the spectroscope—was brought to the aid of the astronomer and geologist. This instrument developed the fact that light was capable not only of being separated into its primitive colors; but also, that under proper manipulation, it could be made to mark or superimpose upon those colors certain hands and lines, by which the identity of the element or substance which sends forth the light may be readily detected. These facts having been learned by experimenting with various substances in the laboratory, the light from the sun and stars, and from nebulae and comets was also submitted to its test with results equally satisfactory; and it is by this means that astronomers have of late years been actually studying the geology of the sun and stars. The progress of this study has demonstrated the fact, not only that the whole family of planets in our solar system has had a common experience or history; but that every body in the visible universe undoubtedly belongs to one system of matter.

It is definitely proven by the apetroscope that the mineral constitution of all the stars, comets and nebulae is similar to that of the earth. We have learned by it enough of the phases of matter to feel certain that our own system represents all the various progressive stages in the natural evolution of matter from its gaseous condition, as observed in the faintest comets or nebulae, to the completed, worn out, planetary condition exemplified in the moon.

The spectroscopes has fully verified the nebular theory that all matter was once diffused through space in the form of a vapor or fire-mist of a most attenuated state, which, under some special condition or creative act, became detached and divided into fragmentary portions, the contraction of which inaugurated rotation, which was inevitably accelerated until peripheral rings were thrown off, broken, and aggregated into planets.

Our sun, near "the beginning," occupied a sphere in space, whose boundary exceeded that circumscribed by the revolution about the sun of the most distant planet of our system—perhaps one even yet undiscovered. It has continued to throw off periphery rings until our whole family of planets has been produced, and then by such successive offshoots and contractions has at last come to occupy its present condensed form in the center of the system. Most of the planets, in their turn, following the same law, have thrown off smaller rings forming secondary planets or moons.

The most striking and instructive feature in our system is Saturn with its eight moons and grand system of rings. The first thought that was suggested by those rings, when their character first became known, was the nebular theory of planetary origin. And now that the spectroscope has demonstrated beyond doubt the absolute identity, in composition, of sun, planets and stars, this visible instance of the ring-condition of a planet furnishes a demonstration even more convincing than written history or laboratory experiments, of the abso-

late truth of the theory above set forth of the origin of suns and planets. The existence, in space, of comets, asteroids, meteors, etc., is easily accounted for on this theory, as merely fragmentary bodies of matter, observing the same laws of gravitation, rotation, etc., as the larger bodies.

"Thus" to quote the words of the little pamphlet before us, "The present state of the solar system is a living picture of the entire history of a single planet. From the solar fire-mountain to ring-girt Saturn—from Saturn to storm-battered Jupiter—from Jupiter to the sunny summer time of our own planet—from earth to autumn-browned Mars, and from Mars to the wintry silence and desolation of the dark gulches of the Moon—here is a series of stages which carry thought back into the eternity long lapsed, and onward into the measureless depths of the future, and confer upon human intelligence a sort of exemption from the limitations of finite existence."

This little pamphlet alluded to, which may be bought of Libby & Swett, No. 3 New Montgomery street, for 25 cents, presents a succinct statement by Prof. Winchell, of the University of Michigan, of the principle facts elicited by the combination of the telescope and spectroscopic in the study of the heavenly bodies, a mere reference to which we have made above. It forms No. 7 of a series of concise papers upon various scientific subjects, now in course of publication by Estes & Lauriat, of Boston, also for sale as above. These publications have thus far been prepared with special reference to the capacities and understanding of the general reader, and are presented in a most felicitous and attractive style. This growing demand for books of this character, devoted to popular sciences, in all its various phases, is one of the most encouraging signs of the times; and so long as the supply is continued, and kept free from matter which is too abstruse and technical to be clearly understood by the average reader, we believe the demand will not only continue but increase, until the great mass of the sensational reading of the day, as well as the more unprofitable light literature, with which the country is flooded, shall be so neglected as to be unremunerative to the publishers.

Narrow-Gauge Railroads.

The people of the Pacific Coast are fully alive to the importance of railroad communication, and strenuous efforts are being made in various localities to improve property and facilities of transportation by building roads. Narrow gauge lines are in great favor, as they are built at a comparatively small expense, and are peculiarly adapted for the generally mountainous character of the Pacific Slope. As will be seen by the following recent railroad news, considerable attention is being turned to the subject, and several lines are in process of construction.

Measurements are being taken to get the proposed narrow-gauge railroad from Oroville to Reno started. It is said that about \$250,000 has already been subscribed.

It is understood that the San Joaquin and Tulare Narrow Gauge Railroad Co. intend pushing their road through at once. The Engineer Corps were at work in Stockton on the 12th inst., prospecting for a starting point.

The ceremony of breaking ground on the Salt Lake, Sevier Valley and Pioche Railroad took place at Salt Lake on the 14th inst. It is expected that the line will be opened to Salt Lake by July 4th, and to Stockton by the latter part of the Summer.

The Wahsatch and Jordan Valley narrow gauge railroad is completed to Granite, at the mouth of Little Cottonwood Cañon, Utah. The total distance is twenty-one miles. This road will afford great facilities for transportation of ores from the rich and extensive mineral district in the Cañon. It is expected that the road will be completed to the Emma and Flagstaff mines by the 1st of June.

The work of grading for a branch narrow-gauge of the Utah Northern Railroad from Bingham City to Corinne, is going on rapidly.

In connection with the Elko and Hamilton (White Pine) narrow-gauge railroad, the Reese River Reveille says that Mr. A. A. Cohen a prominent railroad man of California, has deposited with him by Messrs. Gilmer and Sanbury the sum of \$150,000 in coin as a deposit on three ship-loads of railroad iron and rolling stock—sufficient to complete 50 miles of road.

The Saucelito Herald thinks that a through train from Saucelito to San Rafael on the narrow-gauge railroad will be running before four months are over. Some 800 men are now at work grading between White's Hill and Strawberry Point. At White's Hill a tunnel 1,200 feet long will be run, and a shorter one, two miles south of the large one will shortly be commenced.

The people of Santa Cruz county have recently held a meeting to take into consideration the propriety of building a narrow-gauge

railroad in that locality, and the following resolution, published in this Sentinel, was adopted:

Resolved, That the Executive Railroad Committee be instructed to immediately proceed with the organization of a railroad company, having for its object the construction of a narrow-gauge railroad from Watsonville, thence through the town of Santa Cruz and along or near the coast to the northern line of the county; and that canvassers be appointed to obtain subscriptions, so as to enable us to accept the county aid of \$5,000 per mile, on the terms agreed upon with our Board of Supervisors.

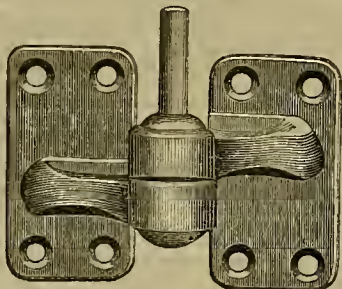
Improved Door and Gate Hinges.

Among the many convenient devices needed by the community has been an efficient door and gate hinge, which could be made cheaply and at the same time be durable and cause the door or gate to close automatically without the intervention of springs, weights or intricate mechanism. Many attempts have been made to fill the want but until recently most of the inventions have either been too complicated and bulky or too expensive to warrant a general introduction. The objections to former devices would seem to be overcome by Norton's door and gate hinge, a recent invention which is shown in the accompanying cuts. It will be perceived at a glance that there is no intricate mechanism in connection with this device. So there is no danger of its getting out of order.

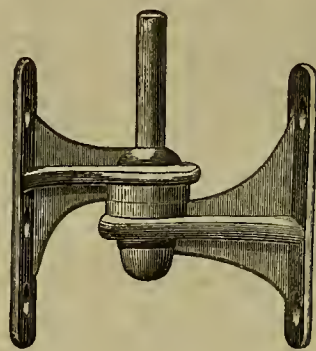
There are two classes of this hinge, the single and double, both of which are shown. The single hinge is applicable to doors or common

There is no necessity of a latch, for the hinge will keep the gate in its proper position when closed. There is very little friction on the hinge, and no liability for it to get out of order. With a large gate a horseman can pass through either way, and it will close automatically behind him. When a team is to be driven through, by merely opening the gate a little wider it remains open, and a gentle twist will release it, when it will close itself. The gate is not thrown out of line by this device; it merely raises it straight up the height of the incline when it is opened. For "front gates" it is particularly adapted, since the gate will always close after any one passes through. Messrs Geo. B. Davis and H. H. Magill own the patent right of this invention for this coast, and Mr. Geo. B. Davis, of Alameda, Alameda county, Cal., has exclusive rights in the territory east of the Rocky Mountains. The hinges are cast in different sizes, and their neatness, durability and practical utility will no doubt cause them to be generally introduced. Mr. Davis is having a number of them manufactured in this city, and will shortly make arrangements for turning them out in large quantities.

THE DIAMOND MOUNTAIN MINES.—John B. Winter has returned from a visit to the Diamond Mountain placer mines, situated in the vicinity of Susanville, in the lower hills of the Sierra Nevada Mountains. The snow was not yet sufficiently melted to allow of mining on the higher hills. Mr. Winters obtained some excellent prospects in coarse gold in places



SINGLE-ACTING HINGE.



DOUBLE-ACTING HINGE.

garden gates, while the double hinge is peculiarly adapted for use on farm gates, or enclosures where it is desired to have the gate open either way with equal facility. On both classes the principle of an incline is employed by an ingenious mechanical application, so that an arrangement is effected by which the gate shall close by its own gravity. The hinge is constructed with double inclines of unequal base upon each leaf, the apex of the widest inclines being cut off at an angle so that when the gate is opened wide it is held in that position without being locked. If the gate is opened so that it is at a right angle from the post, the construction is such that it will remain so, and can be closed by a gentle touch; but if it is only opened half way it will close by its own gravity. There is no strain on the pintles as they only serve as guides to hold the inclines against each other; while by the employment of inclines of unequal base, the whole weight of the gate is supported by the single-bearing surface of the wide inclines, and is held open without being locked; consequently the necessity of lifting it preparatory to closing is avoided.

It will be seen that the hinge is a very simple and practical one, there being no springs or other contrivance to get out of order. In opening or closing a farm gate no lifting is necessary, the hinge performing the operation itself by the gate being pushed in the required direction. There is no danger of its dragging on the ground if the gate post is properly set, and when closed is securely locked by itself.

where the snow had disappeared. He made several cuts through the gravel deposits and succeeded in finding bed-rock, a thing which had not been done before. He found upon the bed-rock a considerable quantity of very hard cement. The weather was so cold that he did not dig through this cement nor make more than a very rough test of it. It is supposed that in following the bed-rock into the hill the cement will be left above it in a horizontal stratum. Susanville is full of prospectors from California, who are waiting for the disappearance of the snow in order to commence operations. At the time Mr. Winters left it was thought that the snow would be gone in a couple of weeks, at least from the range where the gravel is found. The late snow-storm, however, have doubtless given the hills in that region a fresh coating.—*Alta*.

UTAH MINING INCORPORATIONS.—Two new mining companies were incorporated in Salt Lake last week, each with a capital of \$1,000,000. The companies are called respectively the Utah Belcher and the Rocky Mountain smelting company. On the 10th, the Otsego mining company was incorporated with a capital of \$3,000,000. This latter company was organized at Otsego, New York, to operate in Utah mines.

SUTRO TUNNEL.—The Terrestrial Enterprise of the 11th says: It was yesterday reported that Adolph Sutro had succeeded in negotiating in Europe a loan of \$3,000,000 for the Sutro Tunnel Company. What foundation there may be for the report we are unable to say.

COAL.—The yearly consumption of coal in Great Britain is 118,000,000 tons.

PATENTS & INVENTIONS.

Telegraphic List of U. S. Patents Issued to Pacific Coast Inventors.

(REPORTED OFFICIALLY FOR THE MINING AND SCIENTIFIC PRESS, DEWEY & CO., PUBLISHERS AND U. S. AND FOREIGN PATENT AGENTS.)

By Special Dispatch, Dated Washington, D. C., April 15th, 1873.

FOR WEEK ENDING APRIL 1st, 1873.

MACHINE FOR INSERTING SCREW-PIES IN BOOTS AND SHOES.—Andrew Cavall, assignor one-half interest to Victor Noly, S. F., Cal.
PROCESS OF SEPARATING GOLD AND SILVER FROM BASE METALS.—Erick Lundquist, Grass Valley, Cal.
TRACK CLEANER FOR HARVESTERS.—Orrin Du Bois, San José, Cal.
PRESSER BLOCK FOR PANTS.—Lewis Cohen and John C. Waller, S. F., Cal.
PROCESS FOR REMOVING PAPER FROM WALLS.—Catherine F. Ware, S. F., Cal.
MAGAZINE GUN.—Alfred Swingle and Frank A. Huntington, S. F., Cal.
CHIMNEY.—Jeremiah Browell, S. F., Cal.
CHANNELING AND ENGINING TOOL.—Louis Baur, S. F., Cal.
FRUIT KNIFE.—George W. Stevens, S. F., Cal.
FRAT FOR DAYING FACIT.—George W. Stevens, S. F., Cal.
DIAMOND POINTED DRILL FOR DENTAL USE.—James P. Gillispie, S. F., Cal.
METALLIC CASES FOR TURBINE WHEELS.—Abraham Myers, Salem, Oregon.

TRADE MARK.

MEDICINE.—D. D. Tomlinson, San José, Cal.
—The patents are not ready for delivery by the Patent Office until some 14 days after the date of issue. NOTE.—Copies of U. S. and Foreign Patents furnished by DEWEY & CO., in the shortest time possible (by telegraph or otherwise) at the lowest rates. All patent business for Pacific coast inventors transacted with greater security and in much less time than by any other agency.

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s Scientific Press American and Foreign Patent Agency, the following are worthy of mention:

TOP.—N. D. Clark, S. F., Cal. It is seldom that we are able to chronicle the discovery of a new principle in mechanics and its practical application in a toy for the amusement of the rising generation. Mr. Clark has discovered that if we take a tube, one end of which is a flat disk through which the hole in the tube also passes, and make a groove from the center to its outer rim on the under side, and place against this grooved underside an oppositely grooved flat surface, say the upper portion of a common spinning top flattened, and then blow strongly through the tube, the top will be caused to spin or revolve with great rapidity as long as the air passes forcibly through the tube. As soon as the breath is exhausted the top can be allowed to drop upon an even surface when it will spin like any ordinary top. An important feature of this discovery is that as long as the air is passing through the tube under pressure the top will not leave the disk, no difference how it is held, but will remain as it were, suspended in the air and in swift motion very close to the disk. Water, air, or steam can be used to drive the top. Mr. Clark has also applied this principle to a motive power and various other uses.

CONVERTING BUTTER INTO CYLINDRICAL ROLLS. Chas. H. Fancher, S. F., Cal. When our California butter was first introduced into the Eastern market, it was likened by the Eastern people to the bright and shining rolls of \$20 gold pieces so common to our State. This was owing more, perhaps, to the neat and modest manner in which it was put up than to any great superiority in the quality of the butter. Mr. Fancher is a practical butter-man; he saw that the California plan of putting up butter in rolls was to succeed the present plan, practiced in other parts of the United States, of making flat, stamped rolls, or balls. Mr. Fancher's invention consists of a number of mechanical devices by which he is enabled to convert a keg or barrel of packed butter into beautiful rolls in a very short time, so that it cannot be distinguished (by its looks, at least) from freshly-put up butter. One great advantage of his process is that the grain of the butter is not disturbed in converting it into rolls, thus preserving its quality to the last.

STEVEN'S FURNACE.—The White Pine News says it is asserted that great impetus has been imparted to mining operations at Mineral Hill, by the success of the new oxy-hydrogen furnace recently described in our columns. There are large quantities of base metal ore in that vicinity which will pay with economical working.

NICKEL.—It is stated that an extensive nickel mine has been discovered somewhere in Lake County, in this State. The precise locality of the mine has not been divulged, nor have any details connected with it.

The Disilverization of Lead.

The details of this important and essential process in the metallurgical operations connected with lead-mining are fully set forth in Mr. G. H. Makins' *Manual of Metallurgy* (2d edition) recently published, as follows:

As all lead, after reducing, retains the amount of silver originally present in the ore, this has now to be removed, which is done by first concentrating the silver into a reduced quantity of lead and afterwards cupelling this. Formerly, for want of a good and effective process, the lead of commerce always retained a considerable amount of silver, so much as to render its separation a very profitable operation since Mr. Pattinson's process has been in use. That gentleman discovered that if we fuse lead containing any notable amount of silver, and then cool slowly, carefully stirring at the same time, crystals will form in the bath and subside to the bottom; and, moreover, these will be much less rich in silver than the original metal was. Upon this discovery he founded the following operation for removing the poorer lead and concentrating this silver. A series of iron pots, from nine to eleven to twelve in number is employed. These are hemispherical, of about five feet in diameter, and calculated to hold a charge of about nine tons of metal each. They are set in brick furnaces adjacent to each other, but with quite distinct flues, furnaces, dampers, etc. Suppose the series of pots to be numbered consecutively from one to eleven, then each will have a certain place and value in the series, according to the estimated richness of the lead in silver, as usually found resulting in the ordinary course of working the operation. Thus:

Pots Numbers.....	1	2	3	4	5	6	7	8	9	10	11
Ozs. of silver per ton.....	36	24	22½	5	10	20	40	60	160	220	640

Soms 10-oz. lead, that is to say, lead containing 10 ozs. of silver per ton, having been worked, nine tons of it would be placed in the fifth pot and melted, after complete fusion it is skimmed with a perforated ladle; thus the fluid lead runs through into the pot, and the dry oxides are reserved for after reduction. The fire is drawn, and the men stir the metal continually; if, however, it is much too hot, they will throw water upon it, which sets the top lead; this they push down with their slices, but the plan is objectionable for two reasons; first, on account of the danger, as frequently, under some part of the hardened top a certain quantity of water becomes enclosed, and an explosion thence follows; and secondly, because too much water causes an improper formation of crystals, which retain silver (such crystals are, however, easily distinguished).

When the pot begins to thicken from stirring and cooling, one workman takes a crystallizing ladle. These are large iron ladles of 18 inches diameter by about 5 inches deep; they are perforated at the bottom with half-inch holes, and furnished with very long handles. This handle he raises above his head, sinking the bowl down vertically into the lead until it reaches the bottom; then, by bringing the handle down as far as he is able, he holds it for a companion workman to place a hook, which is attached to a chain over it, and thus, by means of a crab and crane, draws up the ladle full of crystals; the first operator then slides the ladle handle under a shoulder of the crane, and it is left to drain; the second resumes the stirring of the pot, while the fluid lead drains out from the holes of the ladle, which is accelerated from time to time by a man in charge of the ladle, who, by shaking the shank, so displaces the crystals as to cause all the fluid lead to run more completely out.

This effected, the crane is turned, so as to bring the ladle over pot No. 4, for these crystals are to be turned into it, and will be found to contain only 5 ozs. silver. These operations are continued until two-thirds of the lead in the pot No. 5 has been passed over in crystals to pot No. 4, that is to say, six tons out of the nine. Now, under pot No. 4 a fire is made up, so that the crystals, as they are thrown in, may be melted. This done, the men, with a large plain ladle, turn the remaining one-third, or three tons, of molten lead in pot No. 5, and which now contains the remainder of the silver, equalling 20 ozs. per ton, into pot No. 6.

Now in produce the operation is thus:—In pot No. 5 nine tons of 10-oz. lead equals 90 ozs. of silver, of which six tons of 5-oz., or 30 ozs., works into pot No. 4; and three tons of 20-oz., or 60 ozs., is ladled into pot No. 6.

Now, providing there is lead of these two assays in the works, that is, three tons of 5-oz to add to the six tons passed into the pot No. 4, and also six tons of 20-oz. in the same way, to fill pot No. 6, this would be done, and both these pots may be worked at the same time with two different sets of men. Six tons from No. 6 in crystals will work into No. 5, and three tons in bottom will be put back into the same pot from No. 4, and thus again fill it without any addition of pig-lead.

The rich lead is now finally submitted to cupellation to separate the silver, and as there is generally a loss of about 5 per cent. of lead in this operation, it is found better to employ less of this high silver value for it.

During the whole operation much oxidation of the lead is going on, and it is estimated that leads averaging 20 ozs. to the ton will produce a quarter of their weight in "dross," or oxide, to reduce; leads of 30 ozs. about one-third; thus 1,000 tons a year of 20 ozs. will give 250

tons to reduce, and the same quantity of 30 ozs. about 330 tons.

Although this lead of commerce is very nearly pure, it is never entirely so; consequently, if it be required chemically pure, the best quality of commercial lead must be taken and dissolved in nitric acid, and the resulting nitrate crystallized repeatedly to purify it. This is then heated to redness in a crucible, whereby the nitric acid being decomposed and driven off, a pure oxide of lead remains, which may be reduced to metal by heating with black flux. But it may thus even retain traces of silver. If, therefore, it is to be freed entirely from silver, lead should be dissolved in nitric acid, purified by recrystallization, and precipitated as sulphate from a dilute solution by sulphuric acid. Thus diluted the silver remains untouched. The washed plumbic sulphates is reduced by heating with sodic carbonate and resin in a lined crucible. Or eight parts of plumbic sulphate may be mixed with four of potash and one of charcoal, and then reduced at a moderate temperature.

Parkes' patented process was for the fusion of argenteiferous lead with zinc, which, on cooling, removes and retains a small portion of the lead, and at the same time abstracts nearly the whole of the silver, the zinc being finally separated by distillation with lime and carbonaceous matter, the lead and silver being divided by cupellation.

Condurifé has patented an improvement thereon by passing superheated steam for two or three hours through the molten lead.—*Iron.*

Diamonds in the Hydraulic Washings of California.

Professor B. Silliman, at a recent meeting of the American Institute of Mining Engineers, read the following paper, "On the Probable Existence of Microscopic Diamonds, Zircons and Topaz in the Sand of Hydraulic Washings in California," which has been published in the *Engineering and Mining Journal*:

The occurrences of diamonds of some size in the gold fields of California is by no means uncommon, and was noticed by me in a communication to the California Academy of Science in 1867, when specimens of this gem, from at least five different localities, were exhibited. I then suggested that a more attentive examination of the heavy sands left in the sluices of hydraulic washings would in all probability detect diamonds, mingled with other rare species not commonly believed to occur in these sands.

Mr. George A. Treadwell, of San Francisco, has lately sent me a small package of these sands, collected by him from the sluices of the "Spring Valley Gravel Mining Claim," Cherokee, Butte County, California. A microscopic examination shows these sands to abound in beautiful colorless zircons (hyacinths), of the form well-known in the hyacinths of Expailly (France), associated with crystals of topaz, quartz in fragments, rounded grains of chromic and titanite iron, and a few small, almost globular, masses of very high refracting power which appeared to be diamonds. To determine this chemically, a portion of the sands was treated with acid for the removal of any carbonates which might be present. There was no effervescence from this treatment. The same sample was then digested in strong sulphuric acid of a high temperature to destroy any particles of organic matter which might be present, washed out in pure water without contact with organic matter, dried and ignited in a vessel of platinum out of contact with air. This sample of the sands thus freed from anything which could afford carbonic acid, but the diamond, was then ignited in a platinum nacelle (boat) in a tube of hard glass, and in a current of pure dry oxygen gas, which, for precaution, was passed over soda lime, and then, after passing the ignited assay, was delivered through a solution of baryta water. The transparency of this delicate test was soon disturbed, and by continuing the experiment for about an hour, a notable quantity of baryta carbonate was obtained. This experiment seems to prove that diamond powder was present in small quantity.

It will be remembered that Prof. Wöhler, some years since, found diamonds by a similar method in the platinum sands from Oregon, associated with the rare species *Laurite*—sulphide of osmium and ruthenium. His paper will be found in the *American Supplement* to the *Chemical News* for November, 1869, p. 317.

The black grains, which contribute fully one-half the bulk of the Butte County sands, are about equally chromic iron, which the magnet removes, and titanite iron, which is unaffected by the magnet. The chromic iron was so proved by the blowpipe, and no magnetite could be detected. No metallic grains of any of the platinum or iridosmium metals, or gold, could be found.

Under polarized light, these crystalline sands form a splendid microscopic object.

When I am provided with a larger quantity of these sands, I propose to determine the amount of diamond dust quantitatively.

In his letter to me, accompanying the sample sent, Mr. Treadwell says: "I have examined much of the sand under the microscope, and think there are a few fragments of broken diamonds. These sands were taken from the tailings after passing through a long flume paved with stone. You know what sharp and hard pounding the gravel gets, mixed with boulders, in a hydraulic flume. No doubt, some diamonds are ground, or rather broken, by hard knocks to powder."

A more attentive observation, by a mineralogical eye, of the sands accumulating in the

sluices of hydraulic washings will, no doubt, be rewarded by the discovery of many rare species, which have thus far escaped notice for want of scientific skill. To show how much may be learned from an attentive study of such sands, Dr. John Torrey has informed me that in a sample of sands from gold washings in Nicaragua, he has found not less than twenty distinct mineral species, many of them of rare occurrences. No doubt, a careful examination of the sands of Oregon, where Dr. Trask found the platinum minerals, would reveal many unsuspected species.

The Gold Placers of the Plains.

When labor, living and supplies are as cheap in Colorado as in the older eastern communities, and its mining population becomes satisfied with a smaller margin of profit, it is probable that the ancient water-courses and bars of that portion of the great Plains lying along the foothills of the Range will become valuable property as placer diggings. The extent of the auriferous deposits outside of the mountains is much greater than is generally supposed, and of considerable interest, on account of the changes that have evidently occurred both in the topography of the valley, and in the courses of the streams, some of which are entirely innocent of any presences to water, or flow now in beds miles away from their ancient channels. How far towards the east gold may be found, it is impossible to say. Probably a belt of country 20 miles in width would include all the land that could be worked with any profit without the introduction of super labor which would barely be compensated for by any amount of billion produced.

From its head to a point some miles north of Denver the Platte is known to be auriferous, while Cherry, Clear, Ralston, Cache-la-Poudre, North and South Boulder, and other of its tributaries yielded the first gold that was found by Americans in Colorado. From the sands of Dry Creek about 8 miles south of Denver, from \$5 to \$10 per day to the man was made as early as 1858, and only on account of the richer discoveries in 1859 of Gregory and his followers in this gulch of Gilpin County, were the deposits on the Plains neglected. The immense yield of those at first, and the subsequent discovery of the network of gold and silver veins that are exclusively found in the mountains, have drawn attention from the deposits on the plains, so entirely, that all these lands are now considered as agricultural when in reality they are in every sense of the word mineral.

The bed-rock under the city of Denver is unusually shallow. At almost any portion of the town it can be reached by a 15 ft. shaft, and in many places it is not necessary to sink more than five feet. The strata of soil are very evenly laid and consist of three separate kinds, namely, gravel with coarse and large boulders intermixed, clay and sand. An examination of any of the excavations being made daily in the city for cellars, etc., will show very plainly these strata are always in the same relative position. The farther away from what is now the bed of the Platte sections of the soil are examined, the larger will be found the layers of sand and gravel, and the smaller the clay. On Capitol hill on one side and the Table lands beyond what is called North Denver on the other, bed-rock approaches the surface very closely and often crops out, indicating the limit of the forces that have produced the ground upon which the city stands. Between these boundary lines it can hardly be doubted that the Platte River once ran, a stream from one to five miles broad and several hundred feet in depth, narrowed at times to perhaps half a mile, and again expanding into huge lakes with shallow and far reaching shores. Such a formation is one in all probability in which Denver now stands, while farther to the south the river was narrower and more rapid.

It has been found and curiously enough, that the swifter the current and more rocky the channel, the larger the deposit of gold. It is a notable fact that the soil which now forms the banks of the Platte for half a mile back from its present channel will yield a color in almost every case, and little pockets have been found that richly repay the prospector even at the present value of time and labor. To the south of Denver its banks are torn up with prospect holes and in its more rapid courses, nearer or under the foot hills, it has yielded largely. The gold found on the plains is very fine grained and thin, and needs the most careful washing to save a fair per cent. Nuggets are seldom if ever found. On the other hand the metal is remarkably pure, and more so than the best obtained from quartz mining. Both these conditions would be naturally expected from the abrasion and rubbing that the metal would naturally have undergone in its long travel from its first place of deposition.

We believe no deep bed rock mining has been attempted on the plains, with the exception of the working of some of the creeks close by the foothills. Should the auriferous deposits in Colorado prove at all similar to those now being worked in California, there yet remains unprospected and untouched a large part of this Territory which may fairly be expected at no distant day to yield its share to the balloon produce of the country. Judging from the character of the ancient bars and creek beds of the Pacific Slope, nothing but deep bed-rock mining will successfully develop the placers of the Plains. And this will need to be backed by large capital and the most approved machinery.—*Colorado Mining Review.*

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passes down, and to the circumference as before. Thus
it is constantly passing a regular flow between the grind-
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reduced to an impalpable powder, and the metal amal-
gamated.

Settlers made on the same principle excel all others
They bring the pulp so constantly and perfectly in con-
tact with quicksilver, that the particles are rapidly and
completely absorbed.

Mill-men are invited to examine these pans and settlers
for themselves, at the office, 229 Fremont Street,
San Francisco.

Richardson & Co., Copper Ore Wharves,
SWANSEA.

RICHARDSON & CO. have been for thirty years established
in Swansea as Agents for the preparation, Sampling, Assay-
ing, and Sale of Copper, Silver, Gold, Lead, Zinc, and all
other Ores and Metals, for which they have extensive Ware-
houses and Wharves under cover, 1,600 feet of Quay Front-
age within the Floating Dock, and the most complete Ma-
chinery and Appliances. They are also prepared to make
advance against Ores in anticipation of realization, and to
guarantee all payments when required. 17v24-1y

PLATINUM
Vessels, Apparatus, Sheet, Wire, Etc., Etc.
For all Laboratory and Manufacturing Purposes
H. M. RAYNOB,
26 Bond street, New York.
Platinum Scrap and Ore purchased. 12v18

Nevada Metallurgical Works.
RIOTTE & LUCKHARDT,
Consulting Mining Engineers and Metal-
lurgists, No. 21 First St., S. F.
WORKING TEST MADE BY ANY PROCESS
—TESTING OF PROCESSES.
Plans furnished for the most suitable Process for Ores.
Assaying in all its Branches.
Analysis of Ores, Minerals, Waters and all other sub-
stances.
Special attention paid to the mining and metal-
lurgy of Quicksilver. 26v11-6m

CHARLES F. KIROHNER,
Sampler and Crusher of Ores,
NO. 11 DRUMM STREET,
San Francisco.

NICKEL PLATING.
The San Francisco Nickel Plating Company
Are prepared to plate articles of all descriptions, of any
metal. Cutlery, Liquor Flasks, Pistols, Ours, Swords, Bri-
dle Bits, Pole Oars, Hub Bands, Dash Rails, and all arti-
cles of household hardware plated at short notice, and
warranted. Nickel Plate never tarnishes or corrodes,
always retaining its polish until the article is worn out.
Office at the KIMBALL MANUFACTORY WORKS, Cor.
Fourth and Bryant Streets. 12v25-3m

LEA & PERRINS'
CELEBRATED
Worcestershire Sauce.

Declared by Connois-
seurs to be the only good
SAUCE
Caution Against Fraud.
The success of this most
delicious and unrivaled
Condiment having caused certain dealers to
apply the name of "Worcestershire Sauce"
to their own inferior compounds, the public
is hereby informed that the only way to
secure the genuine is to ask for LEA &
PERRINS' SAUCE, and see that their names
are upon the wrapper, labels, stopper and
bottle.
Some of the foreign markets having been
supplied with a spurious Worcestershire
sauce, upon the wrapper and labels of which the names
of Lea and Perrins have been forged, L. and P. give
notice that they have furnished their correspondents
with power of attorney to take instant proceedings
against manufacturers and vendors of such, or any
other imitations by which their right may be infringed.
Ask for LEA & PERRINS' Sauce, and see name on
wrapper, label, bottle and stopper.
Wholesale and for export by the Proprietors, Worces-
ter; Crosse & Blackwell, London, &c., &c., and by
Grocers and Oilmen universally. 15v24-1f

EUCALYPTUS.
The attention of the Medical profession is respectfully
called to the following preparation of this new reme-
dial agent. Eucalyptus and its preparations have been
found useful in obstinate cases of Intermittent and Malar
Fever, often supplanting the use of Quinine. The paroxysms
of Asthma and Catarrh are greatly controlled, and in various
Kidney diseases and Catarrh of the Bladder
it seems to act like a specific.

FLUID EXTRACT EUCALYPTUS.
This extract represents in a concentrated form the
medicinal effects of the leaves of Eucalyptus Globulus
THE ELIXIR OF EUCALYPTUS.

This compound presents the properties of the leaves
in a palatable form and elegant appearance. Dose—
One tablespoonful, to be repeated as often as the case
demands.

Cigarettes of Eucalyptus Globulus, useful in
Asthma, Difficulty of Breathing, Incipient Pleurisy, etc.
Prepared and sold by **JAMES G. STEELE & CO.,**
Chemists and Apothecaries,
No. 521 Montgomery St., between Clay and Commercial,
San Francisco. nc28

SHEET IRON PIPE.
THE

Risdon Iron and Locomotive Works
Corner Howard and Beale Streets,

Are prepared to make SHEET IRON AND ASPHALTUM
PIPE, of any size and for any pressure, and contract to
lay the same where wanted, guaranteeing a perfect
working pipe with the least amount of material.

Standard sizes of railroad Car Wheels, with special
patterns for Mining Cars. These small wheels are made
of the best Car Wheel Iron, properly chilled, and can be
fitted up with the improved axle and box—introduced by
this company, and guaranteed to outlast any other
wheels made in this State.

All kinds of Machinery made and repaired.

24v22-3m **JOSEPH MOORE,** Superintendent.

OAKEY & SON'S EMERY AND BLACK
LEAD MILLS, Blackfriars Road, London, England.
OAKEY'S WELLINGTON KNIFE POLISH.
Packets, 3d each; tins, 6d., 1s., 2s., 6d., and 4s. each.
OAKEY'S INDIA RUBBER KNIFE
BOARDS from 1s. 6d. each.
OAKEY'S SILVERSMITH'S SOAP (NON
MERCURIAL), for Cleansing and Polishing Silver, Elec-
tro-plate, Plate-glass, Marble, etc. Tablets, 6d. each
OAKEY'S GENUINE EMERY, GRAIN
AND LUMPS, for Polishing and Buffing.
OAKEY'S EMERY AND GLASS CLOTH.
OAKEY'S CABINET GLASS PAPER,
BLACK LEAD, etc.
OAKEY'S GOODS SOLD EVERYWHERE
by Ironmongers, Grocers, Oilmen, Brushmakers, Drug-
gists, &c. 24v25-1y

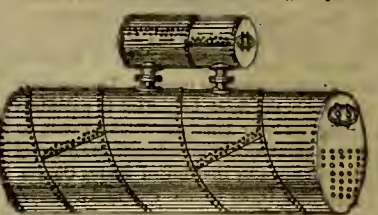
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SCREW BOLT WORKS,

PHELPS BROTHERS, Proprietors
MANUFACTURERS OF ALL KINDS OF

Machine Bolts, Bridge Bolts, and Ship or
Band Bolts.
13, 15 and 17 Drumm Street, San Francisco. 4v24-1y

San Francisco Boiler Works,
123 and 125 Beale Street.....SAN FRANCISCO.
F. I. CURRY.

(Late Foreman of the Vulcan Iron Works,) Proprietor.



High and Low Pressure Boilers of all
Descriptions.

SOLE MANUFACTURERS OF THE CELEBRATED
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SHEET IRON WORK of every description done
at the Shortest Notice.

All kinds of JOBBING and REPAIRING promptly
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Portland Boiler Works.

MOYNIHAN & AITKEN,
311 and 313 Mission St., San Francisco.

T. J. MOYNIHAN. **J. AITKEN.**

High & Low Pressure Boilers
OF ALL KINDS,

Built according to Drawings or Specifications, and
SHEET IRON WORK executed at the shortest notice,
and on the most reasonable terms.

Repairing promptly attended to, and at reasonable
rates.

Agents for Robinson's Government Lock Valve.
4v26-3m

Steam Boiler Manufactory

—OF—
JAMES H. SHANLEY,
(Successor to D. McDonald.)

Oregon street, below Front.....SAN FRANCISCO.

ALL SORTS OF STEAM BOILERS
Made to order and repaired.
Also all kinds of Sheet Iron Work done promptly,
and at prices to suit the times. 25v26-5m

McAFEE, SPIERS & CO.,

BOILER MAKERS

AND GENERAL MACHINISTS,
Howard st., between Fremont and Beale, San Francisco

BLACK DIAMOND FILE WORKS.



G. & H. BARNETT,
Manufacturers of Files of every Description,
Nos. 39, 41 and 43 Richmond street,
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MILL SAW FILES A SPECIALTY.
18v25-1y

NELSON & DOBLE,

AGENTS FOR

Thomas Firth & Sons' Cast Steel.

MANUFACTURERS OF
Sledges, Hammers, Stone
Cutters', Blacksmiths'
and Horse-Shoers'
Tools.

13 and 15 Fremont street, near Market, San Francisco
10v14-q

Pacific Irrigating Pipe and Pump Co.,

A. M. JEWELL, Superintendent.

MANUFACTURERS OF ALL KINDS OF
Wooden Pumps and Pipe.

OFFICE AND FACTORY, SOUTH POINT MILLS,
Berry Street, between Third and Fourth,
SAN FRANCISCO.

Send for Illustrated Catalogue. 10v25-3m

Important Patent Decision.

The suit of David McKay vs. John B. Wooster et al. was brought to restrain defendants from shipping egg cases from territory owned by defendants into the territory owned by plaintiff, both being assignees of different territory under the same patent. The decision in this case is the most important to patentees and assignees ever delivered on this Coast, as it settles a question but once heretofore directly adjudicated upon by the United States Courts, and one concerning which Patent Attorneys, and in fact the patent world, has heretofore been in doubt.

The patent covering the egg case in controversy was obtained through the Scientific Press Patent Agency, by J. L. and G. W. Stevens, of this city, in February, 1867.

In August, 1872, the patentees sold and assigned to F. H. Billings, of Chicago, Ill., all their right, title and interest in the States and Territories East of the Rocky Mountains, and in October, 1872, sold and transferred the patent right in and to the States and Territories west of the Rocky Mountains to this complainant, said McKay.

Billings made and sold the patent egg cases inside of this Territory, and, in the course of business, some of the cases were shipped, filled with eggs, to the defendants at San Francisco.

After citing the single decision upon the points in this case, mentioned above, Judge Sawyer continues as follows:

In the absence of an authoritative injunction, I should hesitate long, before venturing to dissent from a well-considered decision of so learned, experienced and eminent a jurist as Judge Shapley. But, in this instance, I can perceive no good ground for doubting the soundness of the proposition laid down in the guarded form in which it is stated in the case cited.

An important question, not discussed by the learned Judge, may, however, arise, as to when, or under what state of facts, a patented machine may be regarded as "lawfully" sold without restriction, or condition, within his territory, by the territorial assignee of a patent right.

In the case now under consideration, it will be seen by reference to the stipulated facts, that the assignment to Billings was made in August, 1872, while that to complainant was not made till October following. If there is any conflict, therefore, in the rights claimed by the parties, the complainant's assignment so far as the conflict is concerned, being subsequent in time, was taken in subordination to the prior grant to Billings—that is to say, he could only take by his assignment what was left after Billings' interest had been carved out. At the date of the assignment to Billings, the patentees were still the holders of the entire interest under the patent. Had they, at that time, at Chicago, sold one of the patented articles in question, without restriction or condition, that, undoubtedly, would have been a lawful sale without restriction or condition, and the article so sold would have been taken out of the monopoly, and the purchaser, or any one deriving title through him, would have been entitled to use it till worn out in any part of the United States. The patentee, himself, could not by a subsequent assignment of his patent have limited the right of the purchaser already vested. The vendor, being at that entitled to the whole monopoly for the entire jurisdiction of the United States, it was competent for him to wholly emancipate the article sold by taking the entire royalty for the use in any part of the territory. And a sale, without restriction or limitation would work such emancipation.

In such case any party subsequently purchasing thereto to any specific portion of territory, would take that right subject to the use of the machine so sold at any point within the territory purchased. What the patentees could do with respect to one machine, they could do as to any number of machines in existence, or to be brought into existence. What they could do themselves they could by contract authorize, or convey the right to any other party to do. As the patentees themselves could lawfully sell these patented articles at Chicago without restriction or condition, so as to authorize the purchaser, or those claiming under them, to use the machine anywhere in the United States, they could convey the right to Billings to lawfully do the same.

This authority to emancipate from the monopoly by an unrestricted sale was a part of their "right, title and interest in the invention secured by the patent," that could be exercised and enjoyed at Chicago, or other place east of the Rocky Mountains, as well as elsewhere. The assignment to Billings is in the broadest terms. It is of "all the right, title and interest which the said John L. and George W. Stevens had, in and to the said Letters Patent, and the invention as secured to them by said Letters Patent, and all their rights, liberties, privileges and franchises, which they had, or might acquire by or under said Letters Patent." "for, to and in all the States and Territories of the United States east of the Rocky Mountains."

There is no limitation of the power to vend in the territory. The patentees could lawfully make without restriction or condition,

could use without restriction or condition, or could vend without restriction or condition any where within the specified territory, and all their rights they conveyed to Billings without restriction or condition, who, thereupon, stepped into the shoes of the patentees, as to the territory sold. Had they intended to limit the right of vending, "to vending to be used" by the purchasers within the territory sold only, they should, at least, have so specified the intention, and by some apt words restricted the right of use in the deed of assignment. This unrestricted assignment of the right to vend put it in the power of Billings to lawfully vend the patented article within his territory without restriction or condition, and, thereby, wholly emancipated from the monopoly the articles so sold. The complainant subsequently purchased his territory, and whatever the terms of his grant, he could, of course, only obtain what was left of the franchise, or monopoly.

As the patentees, after their sale to Billings, could not object to sales by him without restriction or conditions, their subsequent assignees cannot object. The latter's right is subject to the right of Billings and those who have lawfully purchased without restriction or condition from him. This is as far as it is necessary to go in this. It is unnecessary, now, to consider the effect of an express limitation in the deed of assignment of the right to vend for the purpose of use only within the purchased territory; or how far the complainant, being a subsequent purchaser of territory, can lawfully vend without restriction or condition, so as to wholly emancipate the article sold from the monopoly, and enable the purchaser of the patented articles of his manufacture to use it in the territory of Billings.

If there is any practical hardship in the construction adopted of the law and contract under it, and it should turn out to be the correct construction, then the patentee, when he desires to assign, must consider whether he can afford to do so without restriction, and the subsequent purchaser, when he wishes to buy, must determine whether he can afford to do so with the burden entailed upon his territory by a prior grant unlimited in the particular indicated. There must be a decree for defendants.

Asbestos.

This remarkable mineral is totally indistructible by fire notwithstanding it consists of fibres as fine as the finest linen. Its name has been taken from a Greek root meaning incombustible. Several varieties of this mineral have different names; amongst them, byssolite, mountain-wood, mountain-cork, mountain-leather, etc. They are all silicates, that means compounds of silica (silicic acid) with an earthy base. The greater number of them are hydrated silicates, but all varieties are distinguished by a crystalline fibrous structure possessing a certain amount of flexibility and elasticity of which usually the whole mass partakes as well as the single fibre. In former years, deceived by the idea that this property belonged exclusively to certain chemical combination, the different varieties of asphalium were supposed to be identical in elementary composition; but we know at present that the asbestos form belongs to no exclusive mineral, but is only a peculiar condition under which many minerals may present themselves. It has been agreed to apply the name "asbestos" only to those fibrous minerals possessing the chemical composition of the augit or amphibolite. The ordinary German asbestos at Tyrol is of this class; also the mountain-cork of Tillerthal, and the fibrous travertine. The fibrous amphibolite forms a kind of asbestos, to which belongs the fibrous tale of St. Gothard, the fibrous Krokodyolith. In all these minerals a portion of the magnesia is displaced by basic water, and it is exactly the presence of this water which appears to give to these minerals the fibrous structure, and in general causes the crystalline structure to be found with one long axis, obliterating all outward aggregations of molecules. The term by which this is expressed scientifically is that those minerals are the result of a homoaxial paramorphose.

Other minerals adopting sometimes the arbut-like structure, are the serpentine and tourmaline. To this class belong the mountain-wood, which are found on Staten Island, United States, and the mountain-leather of the Tillerthal, Germany.

The ancients used the asbestos fibres for the manufacture of incombustible woven products, which they chiefly used to wrap up the corpses previous to burning them, so as to keep all the ashes together, which were then placed in an urn, and this in the burial vault. In this way they hastened the decomposition of the bodies in ashes, which in our present method of burials is the result of a during many years continued chemical decomposition. Most kinds of asbestos can not be spun or woven without intermixture of cotton or linen fibre, as the asbestos fibres are not quite long enough. The intermixture of longer fibre makes the operation quite easy, and when the fabric is entirely ready, it is simply placed in the fire, when the combustible linen or cotton is burned out and the incombustible asphalt texture remains.

It is an excellent material for the chemist as a filter. Being a silicate, it will filter acids which would destroy the ordinary filters. It is also used to dry air by placing the asphaltum loose in a tube like a sponge, moistening it with sulphuric acid, and passing the air through in a gentle current. Other properties and uses of this material we will mention later.—*Manufacturer and Builder.*

Our Iron Mines.

The Calaveras Mountaineer of the 2d inst., referring to an article in the Stockton Independent touching upon the iron mining interests of the State, has the following pertinent remarks:

The Independent is probably not aware that in the vicinity of Murphys there is known to exist one of the richest iron mines in the world. Ore from it has yielded as high as seventy per cent., while the poorest yielded fifty per cent. In addition to this, in the immediate neighborhood there are immense quantities of soapstone of the finest quality known in commerce. This is extensively used in the erection of furnaces. As far as timber is concerned, from which to get the charcoal necessary for use in the manufacture of iron, there is enough in the immediate neighborhood to keep a hundred furnaces running day and night for the next three generations. That paper well remarks "that it seems strange that an effort has not been made to work some of the valuable iron mines which are known to exist in this State." The answer to this is simple: Our capitalists have been encouraged by the press and the easy manner of making and losing money through stock speculation, to invest their money in mines abroad. In most of these cases it has been a losing game, and this has made them cautious when a known meritorious enterprise is offered for their consideration. The Independent further remarks that the "consumption of iron on this coast is rapidly increasing." This is so.—Calaveras, we predict, will have—before another decade has passed—used millions of tons of iron dug from her own mines. People may say we are sanguine on this point, but time, which at last sets all things even, will prove the assertion to be true. The known richness and vast extent of these mines will sooner or later cause their development. Their comparatively easy access and nearness to point of shipment is also another advantage in favor of development. We hope to hear more upon this subject from the daily press of the State.—*Calaveras Mountaineer.*

Ore Sampling.

A Mechanical device for sampling ores is much needed to replace the tedious and unsatisfactory operation of hand sampling now in use. Equal accuracy in results can be obtained by machinery in this as in every other kind of work, while treble the amount of labor can be performed in the same time. This is of course self-evident and it can only be by reason of the imperfections existing in such machines as have come under the notice of our mill-men, that they are not extensively in use.

Ores in this and adjoining counties are generally sampled after passing through the crusher where they are broken to the size of coarse gravel. In this state the ore proper (galena, zinc blende, and pyrites) is in a finer condition than the gangue; whatever dust there is, is valuable, while the larger pieces are mainly quartz. It can fairly be questioned whether any of the methods of hand sampling succeed in yielding a perfect specimen of the value of a small lot, though variations are as likely to occur on the side of the purchaser as on that of the owner, and while a fair result would be obtained in the long run, individual lots might be under or over valued, owing evidently to the different classes of ore submitted to the same kind of handling.

Again the different methods used by our mill-men and purchasers is proving a source of trouble. Discrepancies in assays such as have occurred at times between them, and which can only be laid to the varying results obtained in sampling, often appear on the surface as carelessness, or worse, on the part of the assayer. Either the adoption by all who buy ore of a uniform system of hand sampling or the use of good machines would bring about more satisfactory results for those whose living depends upon a correct determination of the value of their produce.—*Col. Mining Review.*

MINING IN MEXICO.—Mining in Mexico seems to have been improving for the past three or four years. The annual coinage is now \$22,000,000, and the production is probably about the same, for the smuggling of silver bars has been very slight lately. The yield of the country just before the revolt against Spain had risen to \$25,000,000, and was still, as it had been for two centuries before, steadily increasing; but the civil war was followed, immediately, by a great decline, and the standard of 1808 has never been reached. Sometimes the yield has not been more than \$10,000,000, and the average for the last sixty-five years has probably not been over \$16,000,000.

ARIZONA MINES.—On general principles, says the Prescott, Arizona Miner, we wish to brag of the mineral resources of this Territory, and on behalf of our miners and prospectors extend a cordial invitation to capitalists to come and look at our mines. We need Stetefeldt furnaces, good mills and millmen, and are willing to do everything in our power to secure them.

The Coos Bay News says, "There are four separate companies now organized for the construction of either railroads or canals, to connect the waters of the Coos Bay with the Coquille."

An Act Authorizing Joint Entry by Pre-emption Settlers, Etc.

The subjoined act is to go into effect at once, and orders have been given for the immediate preparation and issuance of circulars from the Land Office for the purpose.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, that when settlements have been made upon agricultural public lands of the United States, prior to the survey thereof, and it has been or shall be ascertained, after the public surveys have been extended over such lands, that two or more settlers have improvements upon the same legal subdivision, it shall be lawful for such settlers to make joint entry of their lands at the local land office, or for either of said settlers to enter into contract with his co-settlers to convey to them their portion of said land after a patent is issued to him, and, after making such contract, to file a declaratory statement in his own name, and prove up and pay for said land, and proof of joint occupation by himself and others, and of such contract with them made, shall be equivalent of sole occupation and pre-emption by the applicant. Provided that in no case shall the amount patented under this Act exceed one hundred and sixty acres, nor shall this Act apply to lands not subjected to homestead or pre-emption entry.

Sec. 2. That effect shall be given to this Act by regulations to be prescribed by the Commissioner of the General Land Office.

Approved March 3, 1873.

Leather Market Report.

(Reported for the Press by Dolliver & Bro.)

The market for Sole Leather continues the same. French Calf steady at old prices, with light demand.

City Tanned Leather, #1	26 00/29
Santa Cruz Leather, #1	26 00/29
Country Leather, #1	25 00/28
Stockton Leather, #1	26 00/29
Jodot, 8 Kil, per doz	50 00/54 00
Jodot, 11 to 13 Kil, per doz	66 00/68 00
Jodot, second choice, 11 to 13 Kil, per doz	55 00/60 00
Lemore, 16 to 18 Kil, per doz	75 00/77 50
Lemore, 12 and 13 Kil, per doz	68 00/70 00
Cornellian, 12 to 16 Kil	57 00/61 00
Cornellian Females, 12 to 13 Kil	60 00/62 00
Cornellian Females, 14 to 16 Kil	60 00/62 00
Ogeran Calf, #1 doz	54 00/54 00
Simon, 18 Kil, #1 doz	60 00/62 00
Simon, 20 Kil, #1 doz	65 00/67 00
Simon, 24 Kil, #1 doz	72 00/74 00
Robert Calf, 7 and 9 Kil	35 00/40 00
French Kips, #1	1 00/1 50
California, #1, per doz	8 00/10 00
French Sheep, all colors, per doz	8 00/10 00
Eastern Calf for Backs, #1	1 10/1 25
Sheep Roans for Topping, all colors, per doz	9 00/13 00
Sheep for Linings, #1 doz	5 00/5 50
California Ransett Sheep Linings	1 75/2 50
Best Jodot Calf Boot Legs, per pair	5 25
Best French Calf Boot Legs, per pair	4 50/5 00
French Calf Boot Legs, per pair	4 00/4 50
Harness Leather, #1	3 00/3 75
Fair Bridle Leather, #1 doz	48 00/52 00
Best Bridle Leather, #1 doz	54 00/58 00
Welt Leather, #1 doz	34 00/37 50
Buff Leather, #1 foot	21 00/24
Wax Side Leather, #1 foot	20 00/22
Eastern Wax Leather	26

San Francisco Metal Market.

PRICES FOR INVOICES.

Shipping prices rule, from ten to fifteen per cent. higher than the following quotations.

WEDNESDAY, April 16, 1873.

IRON.—	
Scotch Pig Iron, #1 ton	60 00/62 00
White Pig, #1 ton	60 00/62 00
Refined Bar, best assortment, #1	— 00/— 06
Scotch Bar, good assortment, #1	— 00/— 06
Boiler, No. 1 to 4	— 05/— 07
Plate, No. 5 to 9	— 06/— 07
Sheet, No. 10 to 13	— 07/— 08
Sheet, No. 14 to 20	— 08/— 09
Sheet, No. 21 to 27	— 08/— 09
Horse Shoes, per keg	9 00/10 00
Nail Rod	11 00/12 00
Norway Iron	5 00/5 50
Roller Iron	5 00/5 50
Other Irons for Blacksmiths, Miners, etc.	6 00/6 50
COPPER.—	
Brass	— 35/— 38
Copper Tin'd	— 50/— 52
O. N. E. Pat.	— 55/— 58
Sheeting, #1	— 28/— 29
Sheeting, Yellow	— 28/— 29
Sheeting, Old Yellow	— 28/— 29
Composition Nails	— 29/— 30
Composition Bolts	— 29/— 30
TIN PLATES.—	
Plates, Charcoal, 1X #1 box	14 50/15 00
Plates, 1C Charcoal	13 50/14 00
Roofing Plates	13 00/13 50
Bacon Tin, Slabs, #1	40 00/42 00
STEEL.—English Cast, #1	20 00/22 00
Drill	20 00/22 00
Flat Bar	22 00/24 00
Plough Points	16 00/17 00
Russia (for mould hearth)	17 00/18 00
Zinc Sheet	9 50/10 00
Nails—Assorted sizes	5 00/5 50

LUMBER MARKET.

CARGO PRICES OF PUGET SOUND PINE REDWOOD.—Ref 1st Price.

Rough, #1 M.	20 00
Rough, #2 M.	18 00
Rough clear, #1 M.	22 50
Rough clear, #2 M.	21 50
Rough clear, #3 M.	20 50
Rough clear, #4 M.	19 50
Rough clear, #5 M.	18 50
Rough clear, #6 M.	17 50
Rough clear, #7 M.	16 50
Rough clear, #8 M.	15 50
Rough clear, #9 M.	14 50
Rough clear, #10 M.	13 50
Rough clear, #11 M.	12 50
Rough clear, #12 M.	11 50
Rough clear, #13 M.	10 50
Rough clear, #14 M.	9 50
Rough clear, #15 M.	8 50
Rough clear, #16 M.	7 50
Rough clear, #17 M.	6 50
Rough clear, #18 M.	5 50
Rough clear, #19 M.	4 50
Rough clear, #20 M.	3 50
Rough clear, #21 M.	2 50
Rough clear, #22 M.	1 50
Rough clear, #23 M.	0 50
Rough clear, #24 M.	0 00
Rough clear, #25 M.	0 00
Rough clear, #26 M.	0 00
Rough clear, #27 M.	0 00
Rough clear, #28 M.	0 00
Rough clear, #29 M.	0 00
Rough clear, #30 M.	0 00

A NEW BOOK ON MINING.
The Explorers', Miners' and Metallurgists' Companion; Comprising a Practical Exposition of the Various Departments of Exploration, Mining, Engineering, Assaying, and Metallurgy. The Most Practical and Comprehensive Work on Mining Subjects Extant. Comprising 640 Pages, and 81 Engravings. By J. S. Phillips, M. E. Price, bound in cloth, \$10 (in ctn); in leather, \$12. Forwarded by mail, in cloth, \$11.40; currency; in leather, \$13.75. Issued and for sale by DEWEY & Co., Patent Agents and Publishers Mining and Scientific Press, S. F.

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Mining and Other Companies.

Notice is hereby given that at a meeting of the Board of Directors, held on the 15th day of March, 1873, an assessment of fifty cents per share was levied upon the capital stock of the Corporation, payable immediately in United States gold and silver coin, to the Secretary, Room 5, No. 33 Montgomery street, San Francisco, California. Any stock upon which this assessment shall remain unpaid on the 15th day of May, 1873, will be delinquent, and advertised for sale at public auction, and unless payment is made before, will be sold on Saturday, the 31st day of May, 1873, to pay the delinquent assessment, together with costs of advertising and expenses of sale.

Office, Room 5, No. 33 Montgomery street, San Francisco, Cal.

Angels Quartz Mining Company---Principal place of business, 408 California street, San Francisco. Location of works: Angels Mining District, Calaveras County, California.

Notice is hereby given that at a meeting of the Board of Directors, held on the 15th day of March, 1873, an assessment of fifty cents per share was levied upon the capital stock of the Corporation, payable immediately in United States gold and silver coin, to the Secretary, Room 5, No. 33 Montgomery street, San Francisco, California. Any stock upon which this assessment shall remain unpaid on the 15th day of May, 1873, will be delinquent, and advertised for sale at public auction, and unless payment is made before, will be sold on Saturday, the 31st day of May, 1873, to pay the delinquent assessment, together with costs of advertising and expenses of sale.

Name.	No. Certificate.	No. Shares.	Amount.
T D Mathewson.....	3	300	\$150 00
T D Mathewson.....	4	314	471 10
T D Mathewson.....	5	500	750 00
T D Mathewson.....	17	20	30 00
T D Mathewson (not issued)		325 5-7	487 57
J H Fish..... (not issued)		342 6-7	574 29
J H Fish, Trustee.....	20	60	75 00
J H Fish, Trustee.....	21	60	75 00
J H Fish, Trustee.....	22	60	75 00
J H Fish, Trustee.....	23	60	75 00
E B Fish.....	9	1000	1500 00
R M Anthony.....	8	100	150 00
R M Anthony..... (not issued)		45 5-7	68 87
R M Anthony.....	19	60	90 00
E H Sawyer.....	11	800	1200 00
E H Sawyer..... (not issued)		228 4-7	342 88
Geo. Osgood.....	12	400	600 00
Geo. Osgood..... (not issued)		114 2-7	171 00

And in accordance with law and an order made by the Board of Directors, on the 4th day of March, 1873, so many shares of each parcel of stock as may be necessary, will be sold at public auction, at the office of Maurice Dore & Co., 327 Montgomery street, San Francisco, Cal., on Monday, April 21st, 1873, at 2 o'clock P. M., of such day, to pay said delinquent assessment thereon, together with costs of advertising and expenses of sale.

Office, Room No. 1, 408 California Street, San Francisco, California (np stmr). 65-31

POSTPONEMENT.—Angels Quartz Mining Company. The above sale is hereby postponed for thirty days, at the same hour and place.

Office, Room No. 1, 408 California Street, San Francisco, California (np stmr). 65-31

POSTPONEMENT.—Angels Quartz Mining Company. The above sale is hereby postponed for thirty days, at the same hour and place.

Columbia Smelting and Mining Co.

Stockholders' Meeting.

A meeting of the stockholders of the Columbia Smelting and Mining Co., for the election of a board of directors, held on the 15th day of March, 1873, an assessment of fifty cents per share was levied upon the capital stock of said company, payable immediately in United States gold and silver coin, to the Secretary, at his office, Room 5 and 6, No. 302 Montgomery street, San Francisco, California. Any stock upon which this assessment shall remain unpaid on the 15th day of May, 1873, will be delinquent, and advertised for sale at public auction, and unless payment is made before, will be sold on Saturday, the 31st day of May, 1873, to pay the delinquent assessment, together with costs of advertising and expenses of sale.

Office, Room 5 and 6, No. 302 Montgomery street, San Francisco, Cal. 1425

POSTPONEMENT.—The day for deeming shares delinquent on the above assessment is hereby postponed until Thursday, the 21st day of April, 1873, and the sale thereof until Monday, the 28th day of April, 1873, at the same hour and place. By order of the Board of Directors.

Office, 114 California street, San Francisco, Cal. 1425

Fear Stone Company of California.—Location of principal place of business and works, City and County of San Francisco, State of California.

Notice is hereby given that at a meeting of the Board of Directors, held on the 15th day of April, 1873, an assessment of fifty cents per share was levied upon the capital stock of the Corporation, payable immediately in United States gold and silver coin, to the Secretary, at the office of the Company, No. 414 California street, San Francisco, California. Any stock upon which this assessment shall remain unpaid on the 15th day of May, 1873, will be delinquent, and advertised for sale at public auction, and unless payment is made before, will be sold on Monday, the 28th day of May, 1873, to pay the delinquent assessment, together with costs of advertising and expenses of sale.

Office, 414 California street, San Francisco, Cal. 1425

Keystone No. One and Two Gold and Silver Mining Company.—Location of principal place of business, 507 Montgomery street, San Francisco, Cal. Location of works, Wallapai Mining District, Mohave County, Territory of Arizona.

Notice is hereby given that at a meeting of the Board of Directors, held on the 15th day of March, 1873, an assessment of fifty cents per share was levied upon the capital stock of the Corporation, payable immediately in United States gold and silver coin, to the Secretary, at the office of the Company, No. 414 California street, San Francisco, California. Any stock upon which this assessment shall remain unpaid on the 15th day of May, 1873, will be delinquent, and advertised for sale at public auction, and unless payment is made before, will be sold on Monday, the 28th day of May, 1873, to pay the delinquent assessment, together with costs of advertising and expenses of sale.

Name.	No. Certificate.	No. Shares.	Amount.
Clark, J. L.....	100	100	\$25 00
Clark, J. L.....	9	100	25 00
Clark, J. L.....	10	100	25 00
Clark, J. L.....	11	100	25 00
Clark, J. L.....	15	250	62 50
Clark, J. L.....	16	250	62 50
Clark, J. L.....	17	50	12 50
Clark, J. L.....	19	60	15 00
Clark, J. L.....	20	60	15 00
Clark, J. L.....	25	25	6 25
Clark, J. L.....	25	25	6 25
Clark, J. L.....	27	25	6 25
Clark, J. L.....	28	25	6 25
Clark, J. L.....	29	25	6 25
Clark, J. L.....	30	25	6 25
Clark, J. L.....	31	20	5 00
Clark, J. L.....	32	20	5 00
Clark, J. L.....	33	20	5 00
Clark, J. L.....	34	10	2 50
Clark, J. L.....	35	10	2 50
Clark, J. L.....	36	10	2 50
Clark, J. L.....	37	10	2 50
Callon, William.....	80	250	62 50
Callon, William.....	81	100	25 00
Callon, William.....	82	100	25 00
Callon, William.....	83	100	25 00
Callon, William.....	84	100	25 00
Callon, William.....	85	25	6 25
Callon, William.....	86	25	6 25
Callon, William.....	114	100	25 00
Callon, William.....	115	100	25 00
Callon, William.....	120	100	25 00
Frederick, William.....	151	50	12 50
Jewell, T. E., Trustee.....	157	72	18 00
Steen, Robert.....	127	200	50 00
Stark, William H.....	134	100	25 00
Stark, William H.....	135	50	12 50
Walsh, William.....	152	50	12 50
Walsh, William.....	153	50	12 50

And in accordance with law, and an order of the Board of Directors, made on the 10th day of March, 1873, so many shares of each parcel of said stock as may be necessary, will be sold at public auction at the office of the Company, on the 6th day of May, 1873, at the hour of 1 o'clock P. M. of said day, to pay said delinquent assessment thereon, together with costs of advertising and expenses of sale.

Office, 507 Montgomery St., San Francisco, Cal. 1419

Hardy Coal Mining Company—Principal place of business, San Francisco, California.

Notice is hereby given that at a meeting of the Board of Directors, held on the 15th day of March, 1873, an assessment of fifty cents per share was levied upon the capital stock of the Corporation, payable immediately in United States gold and silver coin, to the Secretary, Room 5, No. 33 Montgomery street, San Francisco, California. Any stock upon which this assessment shall remain unpaid on the 15th day of May, 1873, will be delinquent, and advertised for sale at public auction, and unless payment is made before, will be sold on Saturday, the 31st day of May, 1873, to pay the delinquent assessment, together with costs of advertising and expenses of sale.

Office, Room 5, No. 33 Montgomery street, San Francisco, Cal. 1425

Lady Franklin Gold and Silver Mining Company—Location of works, Silver Mountain Mining District, Alpine County, State of California.

Principal place of business, San Francisco, Cal.

Notice is hereby given that at a meeting of the Board of Directors, held on the 15th day of March, 1873, an assessment of fifty cents per share was levied upon the capital stock of the Corporation, payable immediately in United States gold and silver coin, to the Secretary, at the office of the Company, Room 5, No. 33 Montgomery street, San Francisco, California. Any stock upon which this assessment shall remain unpaid on the 15th day of May, 1873, will be delinquent, and advertised for sale at public auction, and unless payment is made before, will be sold on Saturday, the 31st day of May, 1873, to pay the delinquent assessment, together with costs of advertising and expenses of sale.

Name.	No. Certificate.	No. Shares.	Amount.
Andrew Willett.....	42	5	\$2 50
Andrew Willett.....	43	5	2 50
B L Oslawski.....	72	5	2 50
Thomas Peters.....	97	10	5 00
Thomas Peters.....	100	5	2 50
Thomas Peters.....	103	5	2 50
John Champion.....	118	20	10 00
Ferdinand Beck.....	141	10	5 00
Anus Wright.....	194	15	7 50
W H Wilson.....	238	5	2 50
James Wilson.....	238	5	2 50
James Wilson.....	250	5	2 50

And in accordance with law and an order of the Board of Directors, made on the 18th day of February, 1873, so many shares of each parcel of said stock as may be necessary, will be sold at public auction, at the office of Maurice Dore & Co., 327 Montgomery street, San Francisco, Cal., on Monday, April 21st, 1873, at 2 o'clock P. M. of said day, to pay said delinquent assessment thereon, together with costs of advertising and expenses of sale.

Office, 501 Montgomery street, San Francisco, Cal. 1425

Lemon Mill and Mining Company—Principal place of business, City and County of San Francisco, California.

Location of works, Eureka Mining District, Eureka County, Nevada.

Notice is hereby given that at a meeting of the Board of Directors, held on the 15th day of March, 1873, an assessment of fifty cents per share was levied upon the capital stock of the Corporation, payable immediately in United States gold and silver coin, to the Secretary, at the office of the Company, Room 5, No. 33 Montgomery street, San Francisco, California. Any stock upon which this assessment shall remain unpaid on the 15th day of May, 1873, will be delinquent, and advertised for sale at public auction, and unless payment is made before, will be sold on Saturday, the 31st day of May, 1873, to pay the delinquent assessment, together with costs of advertising and expenses of sale.

Name.	No. Certificate.	No. Shares.	Amount.
E Van Santen, Trustee.....	2	100	\$100 00
E Van Santen, Trustee.....	4	100	100 00
E Van Santen, Trustee.....	5	100	100 00
E Van Santen, Trustee.....	6	100	100 00
E Van Santen, Trustee.....	8	8	8 00
E Van Santen, Trustee.....	9	8	8 00
E Van Santen, Trustee.....	10	100	100 00
E Van Santen, Trustee.....	11	102	102 00
E Van Santen, Trustee.....	13	100	100 00
E Van Santen, Trustee.....	14	364	364 00
E Van Santen, Trustee.....	15	100	100 00
E Van Santen, Trustee.....	16	350	350 00
E Van Santen, Trustee.....	17	190	190 00
E Van Santen, Trustee.....	280	1512	1512 00
H Zeitska.....	287	100	100 00
John Hahn.....	44	20	20 00
A Durand.....	45	25	25 00
Edward Weisig.....	229	2	2 00
L Ponton de Arco, Trustee.....	100	100	100 00
J C Bollinger.....	56	100	100 00
J C Bollinger.....	56	20	20 00
J C Bollinger.....	286	109	109 00
J C Bollinger.....	298	25	25 00
J C Bollinger.....	299	25	25 00
Erhard Weisig.....	229	2	2 00
Erhard Weisig.....	229	2	2 00
J M Briceland.....	275	450	450 00
J M Briceland.....	300	25	25 00
J M Briceland.....	301	25	25 00
T J Stack.....	56	50	50 00
T J Stack.....	57	50	50 00
T J Stack.....	234	100	100 00
Edward Weisig.....	229	2	2 00
Leon Gilly, Trustee.....	79	350	350 00
Joseph Winterburn.....	83	200	200 00
W H Richardson.....	101	100	100 00
O Soudry.....	108	53	53 00
R Hochkofler.....	111	103	103 00
J C Collins.....	112	2	2 00
H O Henrich, Trustee.....	128	300	300 00
H O Henrich, Trustee.....	128	300	300 00
H H Schafer, Trustee.....	135	500	500 00
H H Schafer, Trustee.....	136	500	500 00
H H Schafer, Trustee.....	145	1000	1000 00
H H Schafer, Trustee.....	206	50	50 00
H H Schafer, Trustee.....	209	19	19 00
H H Schafer, Trustee.....	220	100	100 00
H H Schafer, Trustee.....	221	44	44 00
H H Schafer, Trustee.....	231	25	25 00
H H Schafer, Trustee.....	139	200	200 00
H H Schafer, Trustee.....	140	200	200 00
Henry Steingeler.....	151	40	40 00
Andrew J McJovern.....	163	7	7 00
A A Harvey.....	168	7	7 00
Edward Weisig.....	173	132	132 00
John C Benz.....	190	12	12 00
F W Lougee.....	197	53	53 00
Charles Collischonn.....	238	80	80 00
John W Kohler.....	235	100	100 00
B Heringh, Trustee.....	235	100	100 00
B Heringh, Trustee.....	235	56	56 00
B Heringh, Trustee.....	239	44	44 00
B Heringh, Trustee.....	240	50	50 00
B Heringh, Trustee.....	232	50	50 00
G M Johnson.....	231	50	30 00
D W Davies, Trustee.....	255	10	10 00
Daniel Wagner.....	257	10	10 00
John Miller.....	278	50	50 00
John Hahn, Trustee.....	303	15	15 00
J F Thibault, Trustee.....	not issued	43	53 00

And in accordance with law, and an order of the Board of Directors, made on the twelfth day of February, 1873, so many shares of each parcel of said stock as may be necessary, will be sold at public auction, at the salesroom of Messrs. Maurice Dore & Co., No. 327 Montgomery street, San Francisco, California, on Tuesday, the 18th day of April, 1873, at the hour of 12 o'clock P. M. of said day, to pay said delinquent assessment thereon, together with costs of advertising and expenses of sale.

Office, 508 Merchant Street, San Francisco, California. 1425

Lemon Mill and Mining Company—Principal place of business, City and County of San Francisco, California.

Location of works, Eureka Mining District, Eureka County, Nevada.

Notice is hereby given that at a meeting of the Board of Directors, held on the 15th day of March, 1873, an assessment of fifty cents per share was levied upon the capital stock of the Corporation, payable immediately in United States gold and silver coin, to the Secretary, at the office of the Company, Room 5, No. 33 Montgomery street, San Francisco, California. Any stock upon which this assessment shall remain unpaid on the 15th day of May, 1873, will be delinquent, and advertised for sale at public auction, and unless payment is made before, will be sold on Saturday, the 31st day of May, 1873, to pay the delinquent assessment, together with costs of advertising and expenses of sale.

Name.	No. Certificate.	No. Shares.	Amount.
Clark, J. L.....	100	100	\$25 00
Clark, J. L.....	9	100	25 00
Clark, J. L.....	10	100	25 00
Clark, J. L.....	11	100	25 00
Clark, J. L.....	15	250	62 50
Clark, J. L.....	16	250	62 50
Clark, J. L.....	17	50	12 50
Clark, J. L.....	19	60	15 00
Clark, J. L.....	20	60	15 00
Clark, J. L.....	25	25	6 25
Clark, J. L.....	25	25	6 25
Clark, J. L.....	27	25	6 25
Clark, J. L.....	28	25	6 25
Clark, J. L.....	29	25	6 25
Clark, J. L.....	30	25	6 25
Clark, J. L.....	31	20	5 00
Clark, J. L.....	32	20	5 00
Clark, J. L.....	33	20	5 00
Clark, J. L.....	34	10	2 50
Clark, J. L.....	35	10	2 50
Clark, J. L.....	36	10	2 50
Clark, J. L.....	37	10	2 50
Callon, William.....	80	250	62 50
Callon, William.....	81	100	25 00
Callon, William.....	82	100	25 00
Callon, William.....	83	100	25 00
Callon, William.....	84	100	25 00
Callon, William.....	85	25	6 25
Callon, William.....	86	25	6 25
Callon, William.....	114	100	25 00
Callon, William.....	115	100	25 00
Callon, William.....	120	100	25 00
Frederick, William.....	151	50	12 50
Jewell, T. E., Trustee.....	157	72	18 00
Steen, Robert.....	127	200	50 00
Stark, William H.....	134	100	25 00
Stark, William H.....	135	50	12 50
Walsh, William.....	152	50	12 50
Walsh, William.....	153	50	12 50

And in accordance with law, and an order of the Board of Directors, made on the 10th day of March, 1873, so many shares of each parcel of said stock as may be necessary, will be sold at public auction at the office of the Company, on the 6th day of May, 1873, at the hour of 1 o'clock P. M. of said day, to pay said delinquent assessment thereon, together with costs of advertising and expenses of sale.

Office, 507 Montgomery St., San Francisco, Cal. 1419

Lemon Mill and Mining Company—Principal place of business, City and County of San Francisco, California.

Location of works, Eureka Mining District, Eureka County, Nevada.

Notice is hereby given that at a meeting of the Board of Directors, held on the 15th day of March, 1873, an assessment of fifty cents per share was levied upon the capital stock of the Corporation, payable immediately in United States gold and silver coin, to the Secretary, at the office of the Company, Room 5, No. 33 Montgomery street, San Francisco, California. Any stock upon which this assessment shall remain unpaid on the 15th day of May, 1873, will be delinquent, and advertised for sale at public auction, and unless payment is made before, will be sold on Saturday, the 31st day of May, 1873, to pay the delinquent assessment, together with costs of advertising and expenses of sale.

Office, 507 Montgomery St., San Francisco, Cal. 1419

May, 1873, to pay the delinquent assessment, together with costs of advertising and expenses of sale.

Office, No. 33 New Merchants' Exchange, California Street, San Francisco, California. 1425

POSTPONEMENT.—The day for deeming shares delinquent on the above assessment is hereby postponed until Wednesday, April 24th, 1873, and the sale thereof until Tuesday, May 13th, 1873, at the same hour and place. By order of the Board of Directors.

Office, 33 New Merchants' Exchange, California Street, San Francisco, California. 14

Machine Builders.

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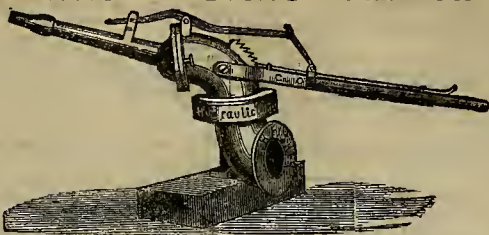
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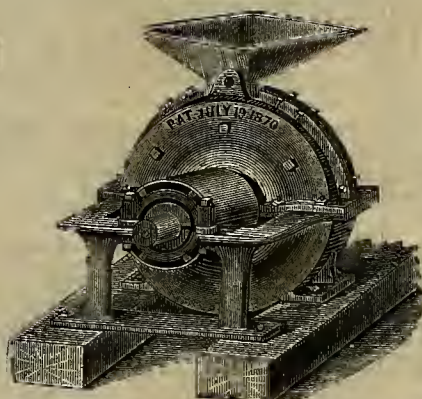
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Steiger & Boland are the sole Manufacturers of the Improved Hepburn Roller Pan. The patterns having all the improvements to those Pans are at the Occidental Foundry, enabling the Establishment to deliver all pans and parts thereof with uniformity, finished to the best style, and at the lowest possible price. Pan Castings furnished the trade, with liberal facilities for section, &c. All persons are cautioned against making, selling or using these Pans, except through the authorized agents and manufacturers, viz., Steiger & Boland, of the Occidental Foundry, S. F.

22v25-3m

WM. H. HEPBURN.

GEO. W. PRESCOTT. C. W. SCHEIDEL. W. R. ECKART

PRESCOTT, SCHEIDEL & CO.,

MARYSVILLE FOUNDRY.

Corner of B and Fourth streets, Marysville, Cal.

MANUFACTURERS OF

STEAM ENGINES,

STATIONARY AND PORTABLE

SAW AND GRIST MILLS,

Hydraulic Machinery,

Quartz Crushing and Amalgamating Machinery

Of every description, constantly on hand.

Plans and estimates furnished upon application. Repairs upon all kinds of Machinery promptly made, and at moderate charges.

Having unrivalled facilities, we are prepared to make to order, at short notice, anything required in our line. Specimens of our work may be seen in all the mining regions on this coast.

THE RISON

Iron and Locomotive Works.

INCORPORATED.....APRIL 30, 1863.
CAPITAL.....\$1,000,000.

LOCATION OF WORKS:
Corner of Beale and Howard Streets,
SAN FRANCISCO.

Manufacturers of Steam Engines, Quartz and Flour Mill Machinery, Steam Boilers (Marine, Locomotive and Stationary), Marine Engines (High and Low Pressure). All kinds of light and heavy Castings at lowest prices. Cams and Tappets, with chilled faces, guaranteed 40 per cent. more durable than ordinary iron.

Directors: Joseph Moors, O. J. Brennan, O. E. McLane, Wm. Norris, Wm. H. Taylor, Lloyd Tevis, James D. Walker.

WM. H. TAYLOR.....President
JOSEPH MOORE.....Vice-President and Superintendent
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24v17-ov

Scaling and Foaming Prevented and Fuel Saved.

Enquirers are respectfully informed that

WARSOP'S AERO STEAM SYSTEM

Has been well tested, during three years, in England. Besides the above advantages, it greatly prolongs the life of Boilers, Tubes and Fire-boxes.

It is a cheap contrivance, and easily applied to any engine.

Illustrated Circulars, showing the appliances and describing its advantages, are sent to all applicants.

All who are troubled with Scale and Foaming may rely on this system of prevention—also on saving at least 20 per cent. of fuel.

RIGHS for States and for individuals will be sold on liberal terms.

J. L. SANFORD,

General Agent for United States,

420 Montgomery street, San Francisco,

And Box 989, P. O.

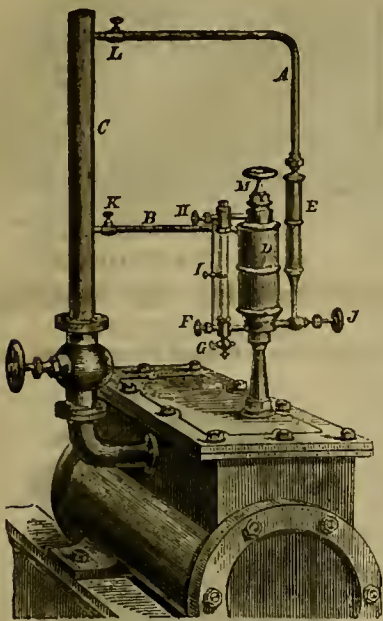
Information Required to Give an Estimate of Warsop's Apparatus:

- 1.—Diameter of Cylinder.
 - 2.—Length of Stroke.
 - 3.—Number and Length of Boilers—Tubes or Flues.
 - 4.—Distance of Boilers from Engine.
 - 5.—Can Pump Piston be attached to Cross-head of Engine?
- It can, however, be driven by any of the usual appliances that work the Water-feed Pump. These items will enable us to give a near estimate of the cost.

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Machinery.

N. Seibert's Eureka Lubricators.



THE HIGHEST PREMIUM

Awarded by the Mechanics' Institute Fair, San Francisco, and State Fair, Sacramento, 1871.

These Lubricators are acknowledged by all engineers to be superior to any they have ever used; feed constantly by pressure of condensed water supplied by pipe A, regulated under this oil by valve J, and forced out through check valve and pipe B into the steam pipe C; it then becomes greasy steam, passes to all the valves and cylinder at every stroke of the engine; glass tube I indicates amount used per hour. Packing on rod and stems lasts longer, and the rings on the piston will not corrode. One pint of oil will last from three to six days, according to speed and size of engine; I, adding gauge; K, valve to shut off when engine stops; H, F, valves to shut off in case of frost; steam does not enter the cup; it is always cool; warranted to give satisfaction. Patented February 14, 1871. Manufactured by California Brass Works, 125 First street, S. F. 24v23ti

IMPORTANT TO Quartz Mining Companies. IMPROVED PATENTED Hardened Cast Steel Shoes & Dies.

The undersigned are prepared, at short notice, to furnish IMPROVED PATENTED HARDENED CAST STEEL SHOES AND DIES, for Quartz Mills of every pattern. This improvement supplies a want long needed by persons engaged in Mining enterprises. They are more economical and cheaper than cast iron shoes, as they wear from four to six times as long, and crush a greater quantity, as they retain their full diameter, never chipping from the edges. This, with the time saved in replacing worn and broken iron shoes and dies, and the great saving of freight to remote mills and mines, makes a vast difference in the cost of reduction of ores.

WE ALSO FURNISH Cast Steel Tappets, Cams, Picks and Hammers,

Which possess the same advantage of Economy and Durability, and deserve the special attention of Miners and others engaged in quartz crushing.

The Superior Strength of these steel castings—the fact that they can be forged and welded as easily as bar steel—their cheapness and great accuracy, as compared with forged iron—cannot fail to make them desirable for many purposes, where forged iron and steel have heretofore been used. Among such articles we mention:

ROLLING MILL CASTINGS.
Bevel and Spur Wheels, Guides, Spindles, Dies, etc.
AGRICULTURAL CASTINGS.
Reaper Guards, Plow Shares, Mold Boards, Plow Joints, etc.

Anvils, Sledges, Vices, Masons' Hammers, Blacksmith Hammers, Mattocks, R. R. Frogs, etc.
And other articles requiring solidity and great strength.

DONKEY ENGINES FOR HOISTING, Mining Machinery, Etc. Persons giving orders will send diagrams and measurements of Shoes and Dies, etc., as above.

J. G. KITTREDGE & CO.,
No. 515 California street, San Francisco.
12v2b-4f

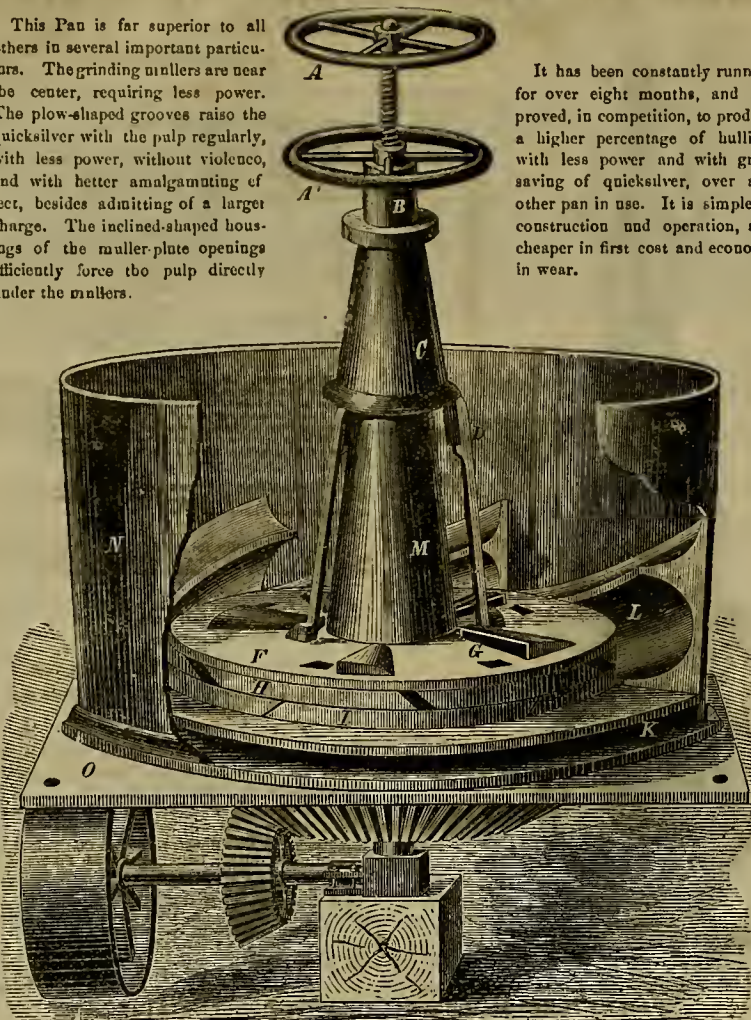
Notice is hereby given, that the copartnership heretofore existing between A. J. Severance, Charles W. Randall and J. Gus. Burt, under the firm name of "Severance, Holt & Co." is this day dissolved by mutual consent. A. J. Severance, having purchased all the interest of his late partners, will continue the business of manufacturing and selling Diamond Drills as before, under the style of A. J. Severance & Co. Dated San Francisco, Nov. 24, 1871.
Office, 315 California street. A. J. SEVERANCE,
OHAS. H. RANDALL,
J. GUS. BURT.

THEODORE KALLENBERG,
MACHINIST,
and Maker of Models for Inventors. All kinds of Dies Stamps and Punches made. Also, all kinds of Small Gears Cut.
Repairing done on very Reasonable Terms and in the best manner. No. 32 Fremont street, S. F. 19v23-2m

Britton, Holbrook & Co., Importers of
Stores and Metals, Tumblers' Goods, Tools and Machines;
111 and 113 California St., 17 and 19 Davis St., San Francisco, and 178 J St., Sacramento. mr-1y

STEVENSON'S PATENT MOULD BOARD AMALGAMATING PAN.

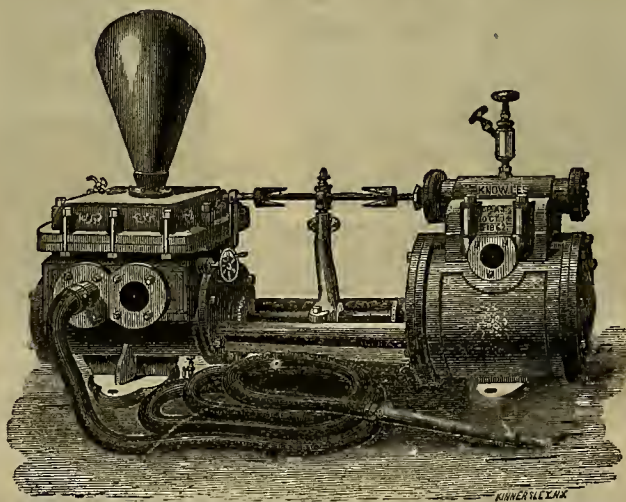
This Pan is far superior to all others in several important particulars. The grinding rollers are near the center, requiring less power. The plow-shaped grooves raise the quicksilver with the pulp regularly, with less power, without violence, and with better amalgamating effect, besides admitting of a larger charge. The inclined-shaped housings of the muller-plate openings efficiently force the pulp directly under the rollers.



Manufactured at the Golden State Iron Works (Co-operative), 19 First street, S. F.

Where it can be examined and further particulars be learned; or persons may apply to the inventor and patentee, Mr. O. O. STEVENSON, at the Douglas Mine, Gold Hill, State of Nevada, where the Pan has long been in constant operation. 15v20-1mr, lamtf

KNOWLES' PATENT STEAM PUMP.



It has no Cranks or Fly Wheel, and has no dead points where it will stop, consequently it is always ready to start without using a starting-bar, and does not require hand-work to get it past the center. Will always start when the steam cylinder is filled with cold water of condensation.

CENTRAL PACIFIC R. R. OFFICE OF THE GEN'L MASTER MECHANIC, SACRAMENTO, CAL., January 14, 1871.
A. L. FISH, Esq., Agent of the Knowles Steam Pump, San Francisco—Dear Sir: In reply to your inquiry as to the merits of the Knowles Steam Pump, in use upon this road, I will say that it gives me great pleasure to report that they have performed their work well whenever called upon. In no instance have they failed. We have now over 30 of them in use on this road as fire engines, and pumping water for shop and station use. I consider the Knowles Steam Pump the best in use, and prefer it to any other. Yours truly,
A. J. STEVENS, General Master Mechanic.

Messrs. KNOWLES & SIBLEY, 32 and 34 Liberty street, New York—Gentlemen: In reply to your note of 31st, requesting my opinion of your Steam Pump, etc., as suggested from my experience with them in a coal service, I have to state that I have used your pump, and entertain the most favorable opinion of their great merit and usefulness, and for every purpose well, we them to be superior to any others, and have so recommended and adopted them. They have given complete satisfaction in all cases that have come under my observation. Yours very respectfully,
WM. W. WOOD.

A. L. FISH, Agent Knowles' Steam Pump—Dear Sir: In answer to your inquiries, we state that the highest award for Steam Pumps at the Eighth or last Mechanics' Fair in San Francisco, was a First Premium and Diploma, awarded to the Knowles Patent Steam Pump, as published in the Official List September 23d, 1871.
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WE BUILD AND HAVE CONSTANTLY ON HAND
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And for Every Conceivable Purpose.
THE CELEBRATED BOOMER PRESS,
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One of these Lamps, when placed at a distance of 200 feet from the bank, will light up a bank surface 250 feet in length and 150 feet high, and to a much better advantage than any other light heretofore tried, and at an expense not to exceed five cents per hour. Lamps furnished at short notice.

Letter of Recommendation.

MR. C. B. BROWN—Sir: Your Patent Lamp for lighting hydraulic mines, which you sold to me in December last, has given entire satisfaction, and far exceeds my expectations, and I think it the best and cheapest light ever used to light mining claims by night, and am satisfied that I have saved three hundred dollars by the use of it in the last mining season over pitch or any other light of the same brilliancy; and I will also say that if I could not get another lamp, five hundred dollars would not buy it. Yours,
W. D. APLIN.

Little York, Nov. 5, 1872.

For further particulars, address,
1022-tf O. B. BROWN, Placerville, Cal.

P. J. PHILLIPS & CO., No. 608 Olay street, near Montgomery, San Francisco, are agents for Brown's Lamp, where it may be seen.

PACIFIC LAMP MANUFACTORY.

EMIL BOESCH,
Patentee and Manufacturer of
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NEW MINING LIGHT.
The proprietor also holds letters patent covering valuable improvements in Street, Ship and Railroad Lamps.

All at the Lowest Rates.
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The Burleigh Rock Drills, which have stood the test of five years' constant use at the Hoosac Tunnel, and which are now in use in nearly every State in the Union, as well as in Europe and South America, are unequalled in efficiency and economy by any other Drilling Machine. They are of various sizes, and equally well adapted to Tunneling, Shafting, Open Cut or Quarrying, and will drill six to ten inches per minute in granite. They are driven by steam above ground. The Burleigh Air Compressor is the best engine yet devised for furnishing the "air motor" for the many purposes to which it is now being used.
They are to be used on the St. Gothard Tunnel, Switzerland; Tunnel 13 miles long. We refer to the following gentlemen and works:

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Sidney Dillon Fourth Avenue Work, N. Y.
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American and Foreign
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this coast, enables us to give the most intelligent ad-
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time for the patentee, in both the MINING AND SCIENTIFIC
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We will send on receipt of stamp for
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rights and privileges of inventors and patentees; list of
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platform to suit purchaser. The same scale is used for
weighing cattle, hogs, etc. Scales adapted to all
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sure protection against till thieves. a19-6m

Ashcroft's Patent Steam
Gauges,
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Steam Gauges,
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Low Water Alarms, Gauge Cocks, Glass
Water Gauges, Cylinder Cups, Self-Oilers,
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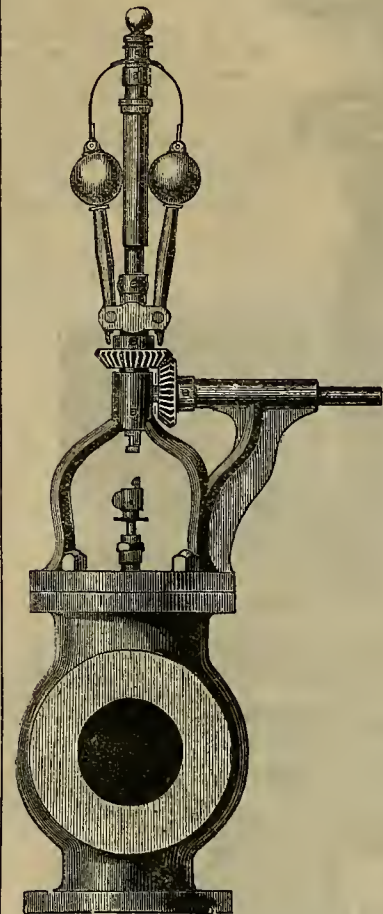
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Manufactured by the San Francisco Gas
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FOR SALE BY ALL GROCERS.
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An active and thoroughgoing young man, aged 30, is
now open to engagements. Thoroughly and practically
understands the complete metallurgy of lead, silver,
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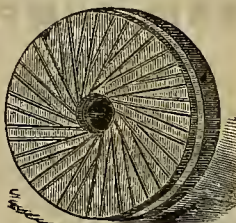
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OVER 400 HAVE BEEN PUT IN USE.



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Circular Saw Mills.
Send for Descriptive Circular. feb22-1am-4t

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FRENCH BURR
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—AND—
Portable Mills.
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Dutch Anchor Bolting Cloths.
BOLTING CLOTHS MADE UP.
Eureka Smut Machines, Bran Dusters, Mill Irons, Spindles,
Balls, Drivers, Steps, Regulating Screws, Silent Feeders, Pul-
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Flights, Plaster and Leather Belting.
Mill Picks, Mill Picks Dressed, Mill Stones Re-
paired and Rebuilt.
Mill Stones Balanced with FELLEBAUM'S PATENT BALANCE, of which I am sole proprietor for California,
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THE GIANT POWDER COMPANY
Are now manufacturing besides the famous regular
GIANT POWDER, A NO. 2 GIANT POWDER.
Some what slower in its Explosion, which we recommend for
BANK BLASTING, COAL MINES,
AND FOR ALL SUCH WORK WHERE THE ROCK IS NOT VERY HARD
It is fully as safe as the other and evolves neither smoke nor noxious fumes when exploded.
Price. 50 Cents per Pound.

The sales of both grades increase very fast, which is the best proof of their superiority over other explosives.
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Manufacturers of SOLID EMERY WHEELS
From 1 inch to 3 feet in diameter. EMERY GRINDERS
for Stone Manufacturers, Foundries, Machine and Rail
Road Shops, Planing Mills and Saw-Mills.
Emery Wheels and Saw Gumming Machines for
sharpening and gumming GANG, MULAY and CIRCU-
LAR Saws. A judicious use of Tanite Emery Wheel-
and Grinding or Gumming Machines, will more than
repay the cost in this year's work.
Write for circulars and Photographs to THE TAN-
ITE CO., Stroudsburg, Monroe co., Pa. 9v26-6ml6p

ROCKY MOUNTAIN NEWS.
Greatest Weekly Newspaper of
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stamp for specimen copy to WM.
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RECOMMENDATION.
St. Patrick Mill, Placer Co.,
Feb. 10, 1873.
JOSHUA HENDY, ESQ., SAN FRANCISCO:

Dear Sir: We, the undersigned, take pleasure in giving
you the following testimonial as to the merits of the Hendy
Governor, which we ordered from you about four months
ago. Though more than pleased with its workings at first,
we deferred writing until we had tested it thoroughly.

Our engine is 12x36 (carrying 70 lbs. of steam), driving 15
stamps, 725 lbs. each; 1 Wheel r Pan, 1 Knox Pan, 6 H. ndy
Conc. ntra ors. The discarded Governor was the common
"Arm and Ball Governor" it giving but poor satisfaction,
we decided to try the "HENDY," and are pleased to report
in its favor for the following reasons:

1st. It SAVES US FUEL. Previous to attaching your Gov-
ernor we were burning 3 1/2 cords of wood per 24 hours. We
now consume but 2 1/2 cords doing the same work.

2d. FOR SAFETY. The "trip" saved us from an expensive
smash up but a few days ago, during the temporary ab-
sence of our engineer. The Governor kept the Pul-
leys. Your little automatic trip worked like a charm, and
but one or two revolutions was the result, and no damage.
Had we been using any other Governor, the probability is
that we would not have had a whole cam in the mill.

3d. It is A PERFECT GOVERNOR. We can turn off the
Wheelser Pan and hang up one-third of our stamp, without
any perceptible change in speed.

4th. THE ADJUSTMENT for regulating the speed without
increasing or reducing the size of our Governor pulley, is
admirable, and as easily managed as setting a clock.

5th. It is SIMPLE and not liable to get out of order, or
requiring more than ordinary care.

Yours respectfully,
JAS. H. CROSSMAN, Supt.
(Signed by request.) GEO. H. BARNEY, Chief Eng'r.

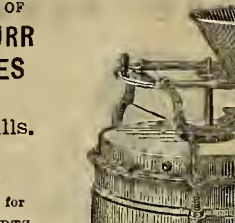
REFERENCES:
Rhode Island Mill, Crown Point M. Co., Gold Hill, Nev.
Eureka M. Co., Overman M. Co., Virginia City, Nev.
Camp Floyd M. Co., Utah S. M. Co., Utah.
Falk & Miner, Eureka; J. M. Brown, Hollister; Gazos
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All Governors Tested, the Number Revo-
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Warranted Perfectly Reliable.

Each Governor is warranted in every respect.
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Flights, Plaster and Leather Belting.
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GIANT POWDER, A NO. 2 GIANT POWDER.
Some what slower in its Explosion, which we recommend for
BANK BLASTING, COAL MINES,
AND FOR ALL SUCH WORK WHERE THE ROCK IS NOT VERY HARD
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From 1 inch to 3 feet in diameter. EMERY GRINDERS
for Stone Manufacturers, Foundries, Machine and Rail
Road Shops, Planing Mills and Saw-Mills.
Emery Wheels and Saw Gumming Machines for
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LAR Saws. A judicious use of Tanite Emery Wheel-
and Grinding or Gumming Machines, will more than
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Greatest Weekly Newspaper of
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Brass and Bell Founder,
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MANUFACTURERS OF
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CASTINGS.
Church and Steamboat Bells,
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Steam, Liquor, Soda, Oil, Water and Flange Cocks,
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Hose and all other Joints, Spelter, Solder and Cop-
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Highest Market Price paid for OLD BELLS, COP-
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Patent Tooth Circular Saws.
They have proved to be the most durable and economi-
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Each Saw is Warranted in every respect.
Particular attention paid to construction of
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Covered by Numerous U. S. Patents.

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Mining Companies, Civil Engineers, Con-
tractors, Etc.

The system of transporting material, such as Ores,
from the mine to the mill, Earths for embankments,
Rock from quarries, etc., by means of steel wire rope,
has been well tested and found more economical,
advantageous and reliable than any other method
of transportation; and to the annexed certificates in con-
nection therewith I beg to call the attention of those in-
terested:

EUREKA, Nevada, July 10, 1872.
T. M. MARTIN - My dear Sir: On your leaving for San
Francisco, it gives me great pleasure to hand you my
written acceptance of the HALLIDIE TRAMWAY put
up by you upon our mine in Freiburg.

It is a perfect success, discharging ten tons of ore per
hour with two men's labor. It is perfectly simple in
construction, and, as far as I can judge, there is nothing
about it to ever get out of order—nothing to wear out.
While ours requires but about two thousand five hun-
dred feet of wire rope, I can see no reason why the line
could not be extended almost indefinitely with equally
happy results. Again, the carrying capacity might be
doubled or quadrupled if desired. After several weeks
trial upon our mine, the unanimous verdict of all who
have seen it is a complete, unquestioned success. If
this can be of any service to you, use it in any way you
think proper. Very respectfully, O. C. GOODWIN.

EXUMA HILL CONSOLIDATED MINING CO.,
Little Cottonwood, Utah.
Superintendent's Office, Sept. 28, 1872.

T. M. MARTIN, Esq.—Sir: The Ropeway constructed by
you (HALLIDIE'S PATENT) for the Exuma Hill Consoli-
dated Mining Company, has been built in a most substan-
tial and workmanlike manner, and is at this time in splendid
working condition. I most cheerfully accept the work for
the Company, and recommend it to others wishing a safe
and speedy transit for ore over places impracticable for
wagon roads, etc. Respectfully,
L. W. COLBATH, Superintendent.

"The Vallejo works smoothly with the elevated wire
tramway, which carries its load of ore as quietly and easily
as if there was no winter or snow in the world."
"Whatever the objections to wire tramways may be on
account of their cost, I have seen nothing yet that even
approaches them in the facilities they afford for moving
ore at all seasons of the year."—Correspondent Utah Mining
Journal, Alta, Jan. 8, 1873.

The Vallejo Ropeway.
The Vallejo Tunnel Company's Tramway in Little Cot-
tonwood, built on the HALLIDIE PATENTED PLAN, is a
complete success. It is between 2,400 and 2,600 feet in
length, and is supported by thirteen stations. The fall in
this distance is about 600 feet, and the wire rope, which is
three-fourths of an inch in diameter, will safely and easily
deliver one hundred tons in six hours. The machinery is
automatic, loading and unloading the sacks or buckets.
About one ton and a half can be sent down at one time.
The stations are about two hundred feet apart, and the entire
apparatus is strong and safe. As the wire rope is elevated
about forty feet above the surface of the hill, the Tramway
can be worked all winter long, without the slightest trou-
ble.—Utah Mining Journal, Salt Lake, Sept. 22, 1872.
Mining Companies and others desiring to negotiate for
the erection of this system of Ropeway, can communicate
with me personally, or through Postoffice Box 264.

A. S. HALLIDIE, Patenteo,
112 and 114 California Street, SAN FRANCISCO.

WIRE ROPE
For hoisting from mines, transmitting power, ship rigging,
etc., of all kinds and sizes, on hand and made to order.
Wire of all kinds and descriptions, furnished at lowest
rates. A. S. HALLIDIE, 112 and 114 California St.

MINING AND SCIENTIFIC PRESS.

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Patent Solicitors.

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Important to Smelters—A Patent Section Slag Pot.

Prior to the White Pine excitement of four years ago, the only gold and silver-bearing ores of the Pacific Coast that received any attention from our prospectors and capitalists, were those that could be reduced by mill process. The milling process consists of reducing the ore by means of heavy stamps, to a fine state of mechanical division, and subsequently extracting the precious metals by amalgamation. Certain milling ores, however, require to be roasted, in suitably constructed furnaces, in order to set the precious metals free, so that the quicksilver can amalgamate with them. Soon after the discovery of the White Pine and surrounding districts, it was proven by experiment, that although some of their gold and silver-bearing ores could be easily worked by the ordinary mill process, the ores of the base metal range, owing to the presence of more or less lead, could not be profitably reduced by any known milling process. Attention was therefore turned to smelting, and the discovery in California, Nevada and Utah of vast bodies of lead ore, containing gold and silver in paying quantity, has created a new era in the metallurgy of the Pacific Coast. The smelting furnace thus far principally used in reducing these "base metal ores" is a modification of the ordinary iron blast furnace. The charcoal and ore alone, or else ore mixed with the proper fluxes (if these be required), are fed into the furnace in alternate layers, at a distance of ten to twelve feet above the level where the jets of air are forced into the furnace. As the charge of charcoal and ore moves downward, it becomes heated, first to redness, and subsequently to the smelting point. This temperature attained, the lead, gold and silver are separated in the metallic condition, while the iron, lime and other constituents of the ore are converted into slag. The metal finds its way to the bottom of the furnace—the slag, being lighter, floats upon the melted metal. The metal is drawn off at intervals from the bottom of the furnace and the slag runs off as fast as formed, over a slag spout, into a slag pot. A great improvement has recently been made in the construction of these slag pots, an illustration of which is shown on the accompanying page.

Figure 1 shows the form of the ordinary slag pot, which is simply a conical cast iron pot, with three legs upon which it stands, and four trunnions by which the pot is handled. These slag pots are about two feet high, and weigh four to five hundred pounds, according to their thickness. Foundrymen are familiar with the fact that iron castings of irregular form and unequal thickness in their different parts, are often very fragile. Sometimes it even happens that such castings will remain apparently perfect for some days, and then suddenly crack and fall apart spontaneously. But commonly, such fracture requires a disturbing cause.

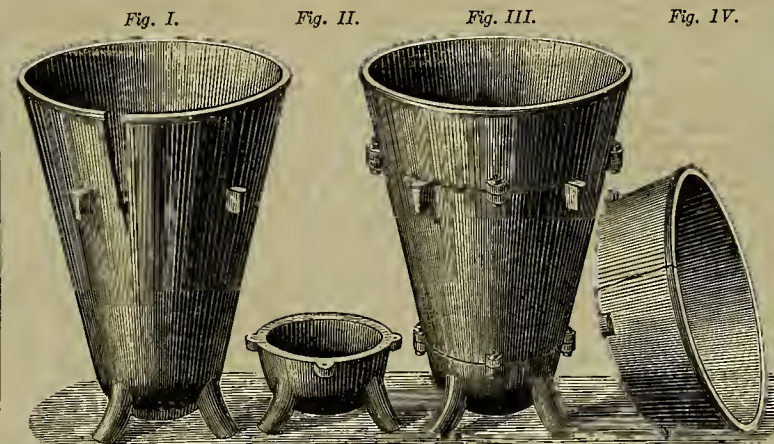
The ordinary slag pot, when cast with the usual precautions, will bear transportation and a certain amount of rough handling without cracking. But the effect of running into them a slag heated sometimes to whiteness, is the same in kind though less in degree, as pouring boiling water into a thick glass tumbler. The ultimate consequence is a crack, and the "skin" of the casting being broken, the forces opposed to cohesion (produced during the first cooling of the pot in the "flask"), held in check before breaking of the "skin," now overcome the cohesive force, and the crack rapidly opens into a V shape, as shown in Fig. 1, and sometimes extends half way down the pot. In this condition, a pot is quite useless—the iron of an old slag pot being too much "burned" to be fit for recasting. Fig. 3 shows the section slag pot invented by Prof. R. H. Fisher of this city, the patent for which was obtained through the SCIENTIFIC PRESS agency. The illustration speaks

for itself. As shown in the figure, the slag pot is cast in sections. The edges of the sections are turned in a lathe, then washed with a strong solution of Sal Ammoniac, (to produce a perfectly tight "rust joint"), and after being put together are firmly held in place by iron bolts, passing through the four ears or lugs on the edges of the sections. The value of the patent section slag pot has been fully tested, and is now used almost exclusively at the Richmond furnaces at Enreka, Nevada.

A crack commencing at the top of one of these slag pots, is of course limited to the section, and experience has proven that a crack does not open, as in Fig. 1., but remains sufficiently closed, as represented in Fig. 4., to permit the pot to be filled to the usual height with slag.

Should the top section crack in more than one place and become useless, the sections being "interchangeable," a new top section (costing only one-third of the price of a whole pot), puts the old pot into a thoroughly renovated condition.

It sometimes happens with the ordinary slag pot, that the bottom is cracked by hot slag the first time it is used. When slag pots are cast in sections, there does not exist the same strain upon the different parts of the pot as if it be



cast in a single piece. The bottom section of the new slag pot seldom cracks, but in case of such mishap, it is renovated by replacing the broken bottom section.

Some idea of the importance to smelters of this simple invention will be conceived upon considering that the ordinary slag pot weighs four hundred pounds or upwards, and if transported from San Francisco to any considerable distance from a railroad station, they cannot be laid down at a cost (including freight) of less than fifty dollars. Beside the "Patent Section Slag Pot," Prof. Fisher has invented a new "slag spout," a "tweezer tester," by which a leaky water tweezer can be detected almost immediately; and a means of preventing the formation in tweezers of the incrustation (from the use of impure water) that is so frequent a cause of "burning out" the tweezer. Patents for all these inventions have been secured through the agency connected with this office. The "slag pot" is manufactured by Messrs. Hawkins & Cantrell, No. 210 Beale street, San Francisco, who may be addressed for further information.

ACADEMY OF SCIENCES.—The rooms of the California Academy of Sciences on Clay street between Montgomery and Kearny are open on Mondays, Wednesdays and Fridays, from 9 A. M. to 4 P. M., when visitors may inspect the curiosities. The collection of the Academy is large and varied and while but a small proportion of it is in a position to be examined as yet, it will repay a visit to those who have an interest in natural history. Most of the specimens to be seen are of Pacific Coast origin and as no entrance fee is required a good chance is given for every one to see them.

The Dangers of Coal Oil and How to Avoid Them.

During the year 1872, fifty-nine fires—the largest number from any one cause—originated in Philadelphia, from the explosion of coal oil and lamps, and about 100 deaths were caused from these fires and from coal oil explosions, not attended by fires. This is an enormous loss of life and property to be charged to a single cause, in a single city.

The number of deaths from similar causes in the entire Union, during 1871, was about 3,500; and probably three times that number were more or less severely burned or maimed. These facts have carefully been collected by insurance companies, whose interest and business it is to collect such statistics. This is a terrible record indeed; and when the fact is borne in mind that nearly nine-tenths of the casualties are the results of sheer carelessness, which the most trifling caution or forethought

accidents will certainly be avoided; for the more volatile the oil the cheaper can it be afforded, and the more dangerous is the compound.

Accidents often occur from the evaporation of cheap oils so filling a room as to render the gas explosive, as is the case when ordinary gas escapes from a burner, and a light is brought into the room—the gas is fired more surely and suddenly than gunpowder would be under such circumstances. When the mixture of gas reaches an extent of four parts of gas to one of common air, the compound is highly explosive. No family can be safe with a can or lamp of kerosene standing near a hot stove.

A burning wick turned down becomes a live coal. It consumes but little oil and gives but little light; but it always heats the tube to a dangerous extent, thereby raising the temperature of the oil in the lamp, causing rapid evaporation, which is liable to find its way, in company with the right proportion of atmospheric air, to the small blaze, and an instantaneous explosion takes place. Never turn the wick of a kerosene lamp down very low, except when you do so to extinguish it.

Coal oil, when first introduced for general illuminating purposes, had a burning point of 125°, and was used with great timidity and care. The accepted standard has since been reduced to 110°, and familiarity has led to its more careless use. Dealers often mix light oils with that of the 110° degrees of that standard, thus reducing it still lower, because the lighter oil is also cheaper; and moreover such a mixture gives a better light. Many customers will have the best light, careless or ignorant that the danger increases with the brilliancy of the light.

Dealers in light oils, to show the safety of their oils, make vain attempts to set it on fire in an open vessel. Let them fill a lamp half full with it, and allow it to reach the warmth that always exists in a lamp after it has been burning an hour, so that the vacant space may be partially filled with the oil vapor, and then try to set it on fire, and our word for it, they will accomplish the thing most effectually.

All the light forms of petroleum, when not closely confined, are constantly though slowly generating vapor, even when the temperature is not more than 10 or 12 degrees above the freezing point; and any oil that generates vapor, rapidly, below two degrees, should be considered very unsafe.

A good and simple way of testing oil is as follows:—Take a small four-inch test tube, which can be obtained at the druggist's for ten cents; fill with oil, place it in the ordinary temperature of a room in summer, and if the evaporation exceeds one-fourth of an inch in 24 hours, the oil is not safe. The best oil will thus remain for days without any perceptible diminution. In the absence of a test tube, a two ounce vial will answer, but the evaporation will be much less, owing to the contraction of the neck of the vial. We recommend to every one to try some simple test before using any new lot of oil.

SATURN SMELTING WORKS.—A dispatch from Salt Lake states that the fire reported at Sandy on the 22d was at Saturn Smelting Works, and not at the Germania. During the absence of the Salt Lake steam fire-engine, two small fires occurred in that city. The engine returned to Salt Lake, leaving the charcoal burning, it being impossible to extinguish it. A terrible wind storm prevailed at the time of the fire; 15,000 bushels of charcoal, four freight cars and 350 feet of the Utah Southern track were destroyed.

might have avoided, the problem becomes still more perplexing.

The use of petroleum is still in its infancy. It is less than fifteen years since its introduction became general; yet the great cause of civilization cannot do without it. Like gunpowder and steam, it has become indispensable. Like those agents, also, in the hands of knowledge, it is a faithful servant; but in the hands of ignorance a terrible master.

The authorities of this city have been and still are very much exercised over this matter. The necessities of the day will not permit its disuse, and beyond certain rules in regard to its sale our authorities cannot go.

The press is continually repeating its words of caution, and almost daily giving the particulars of such accidents, and often pointing out the particular phase of carelessness from which they originated. As we write, we call to mind several instances of gross carelessness, which did not find their way "into the papers," but which have recently occurred almost, and in part, directly under our own observation, and in most intelligent families, where utterly, inexcusable carelessness came near resulting in serious casualties.

What is to be done? The first thing is to restrict the sale of illuminating fluids to the very best article the market affords, even if it cost double what the cheapest can be bought for. The price of the article is low enough, even at the highest figure—by observing this as the chief and first rule, a great number of

Coin and Bullion.

This actual coin supply in San Francisco is a matter of interest. There is probably not over \$15,000,000, and possibly not more than \$12,000,000 in coin in the vaults of the city. It is well known, says the *Bulletin*, that the drain hence for the past two months has been very heavy. Our sources of supply are the Mint and the Express Company. The coinage at the Mint for the first quarter of the year, together with the receipts through the Express, have been as follows:

Coinage at Mint.....	\$3,259,400
Receipts by Express.....	2,404,328

Total supply.....\$5,663,728

Against this amount there have been demands for the payment of duties, for remittances to the interior, and for shipment to New York and other distant markets as follows:

Demands for duties.....	\$1,940,959
Remitted to interior by Express.....	3,559,695
Gold coin exported.....	3,469,043
Silver coin exported.....	15,940

Total withdrawn.....\$8,985,637

To this sum must be added the shipments through the mails, the aggregate of which is not known, but variously estimated at from \$2,000,000 to \$3,000,000. This money will work back again in time, though for the present there will be inconvenience.

The descriptions of treasure shipped from San Francisco during the first quarter of the year, through regular mercantile channels, have been as follows:

	Jan.	Feb.	March.
Gold Bars.....	\$198,681	\$69,954	\$129,237
Silver Bars.....	745,766	393,162	393,080
Gold Coin.....	227,412	1,465,349	1,776,302
Silver Coin.....	10,000	.....	5,940
Gold Dust.....	1,630	3,230	2,500
Mexican Dollars.....	443,280	315,448	249,255
Totals.....	\$1,026,742	\$2,247,123	\$2,554,111

The aggregates for the quarter compare as follows with the same quarter last year:

	1872.	1873.
Gold Bars.....	\$2,225,346	\$397,875
Silver Bars.....	1,834,799	1,634,028
Gold Coin.....	1,511,169	3,469,043
Silver Coin.....	64,773	15,940
Gold Dust.....	2,375	5,110
Mexican Dollars.....	353,573	1,607,983
Totals.....	\$5,030,035	\$6,427,979

The comparison shows an increase for this year of \$400,000. It is probable that as much has gone through the mails since January 1st as for the same time last year. The amount thus shipped is not definitely known, but will probably approximate \$4,000,000, mostly in gold coin. The results of the above table are interesting. It will be seen that there has been an increase of over 100 per cent. in the gold coin shipments. The amount of fine gold sent is quite small compared with last year, while there has also been \$350,000 less of fine silver and \$650,000 more in Mexican coin. Of the \$4,236,000 in treasure shipped hence in the first quarter of 1871, \$2,201,000 was in fine silver, \$1,161,000 in fine gold, \$429,000 in American gold coin, and \$443,000 in Mexican silver coin. Two-thirds of the treasure shipped this year went to New York.

It is a difficult matter to determine the bullion product of the Coast, since it is diverted into various channels. Formerly, nearly all came to San Francisco for a market. Now, large sums go direct from the mines to New York and London. The bulk of that brought to the city comes through the Express Company. The amount reported through that channel for the first quarter of the year, was \$951,300 in fine silver and \$2,081,700 in fine gold and dust, making a total of \$3,033,000. Another way of ascertaining the product is to take the amounts sent to the Mint for coinage and add to them the bullion exports. During the first quarter of the year the San Francisco Assaying and Refining Works sent the following sums to the Mint in this city for coinage purposes:

	Gold		Silver	
	Ounces.	Value.	Ounces.	Value.
January.....	61,063	\$1,252,473	3,391	\$4,549
February.....	48,292	983,780	3,747	5,027
March.....	47,684	977,112	2,630	3,393
Totals.....	157,039	\$3,213,365	9,668	\$12,969

We will now add the bullion exports for the quarter through regular mercantile channels, as follows:

Fine gold deposited at Mint.....	\$3,213,365
Fine silver deposited at Mint.....	12,969
Fine gold exported.....	397,875
Gold dust exported.....	5,110
Fine silver exported.....	1,532,028

Total from January 1st to March 31st.....\$5,166,347

Bullion receipts by Express for same time....\$3,033,030

Discrepancy.....\$2,133,317

There are two explanations for this discrepancy. One is found in the fact that there was some bullion carried over from 1872, and the other is that some bullion has been received through private channels. We believe the receipts for the quarter were much nearer \$5,000,000 than \$3,000,000.

NEW ZEALAND COAL.—The subject of coal is attracting attention in New Zealand. There were imported into that colony last year 93,867 tons of coal, the total value of which was \$121,151. There were exported 1,698 tons valued at \$1,612.

COOMBS & TAYLOR, of 109 Market street, advertise for 150 ship carpenters, to work four months, at \$5 per day—nine hours to constitute the working day.

Mineral Resources of Amador.

Notwithstanding the vast and exceedingly valuable agricultural resources of Amador county, says the *Stockton Independent*: Its greatest wealth has not yet been referred to. As a mineral county it must be considered the leading one in this State. Every old Californian has heard of her rich placer mines, now, however, mostly exhausted, and the fabulous richness of the Hayward quartz mine at Sutter Creek, from which one of California's noted millionaires gained his great wealth, has been so frequently written about that every person in the State is familiar with its story. The quartz mines of the county are still yielding their treasure to the persevering miners, and several mines besides the Hayward mine are still being

Worked at Immense Profit.

Fortunately for this county, these mines are worked for profit at the mine rather than upon California and Montgomery streets, and the owners make their profits therefrom in the shape of dividends, rather than by hawking and bearing the stock in the Board of Brokers of San Francisco. Several hundred men are constantly employed in these mines, and the supplies for them and the machinery for the mills (excepting such as is made at a foundry at Sutter Creek) is transported from the line of the Western Pacific Railroad at great expense. Stockton has none of this trade, and it is today within her grasp, provided her people will but put forth their hands to control it.

Valuable Copper Mines

Also exist in this county, which were worked with profit several years ago, and large amounts of ore shipped therefrom to market. Work was stopped, however, on account of the decline in the price of copper, and the great expense of shipping the ores to market, and for several years nothing was done to develop these important interests. The suspension of the work, however, has probably been a very fortunate circumstance for the present owners of the mines. At the time the work was stopped, some of the tools used were left in the pits, which in time became partially filled with water. When this was pumped out after the lapse of two or three years.

A Remarkable Discovery

Was made. Every piece of Iron and steel that had been left in the mine, where it had been covered with water, was found to be completely decomposed, while around it had formed deposits of crystallized copper, nearly pure. Shovels, hammers, drills and iron bars were completely eaten up by the action of the water, but in their place deposits of copper were found, generally resembling in shape the pieces of iron which had thus so singularly disappeared. Drills and iron bars had, in that singular laboratory, been mysteriously changed into irregular copper tubes. The iron car wheels and the iron fastenings of the car had all passed through this transmutation. The ring and hook attached to the manilla rope used for hauling out the car was covered by the water in the pit, every sign of the iron ring and hook was gone, but in their place a large copper ring and hook were perfectly formed, with the exception of a cavity of the exact size and shape of the iron ring and hook, around which the copper had been precipitated, while the manilla rope retained its original appearance and was still firmly attached to the copper ring which had so singularly taken the place of the original iron one. The owners of this mine have taken advantage of the knowledge thus obtained, and this mine is now

Being Successfully Worked

By a process of which the above was the first example. It is found that the mine contains quantities of sulphurets of copper which, on being exposed to the atmosphere, rapidly oxidize and change to sulphate of copper, a salt that is soluble in water. The ores are now taken from the mine and exposed to the air so that they may become completely oxidized when water is turned over them to dissolve the sulphate of copper, and then run through vats filled with scraps of iron. The sulphuric acid which holds the copper in solution having a stronger affinity for iron than for copper, unites with it, and the copper held in solution is precipitated in these vats, and can be gathered in large quantities. The copper thus obtained is nearly pure, assaying ninety-two per cent., and hundreds of tons are being obtained from ores which by any other process would not pay for working. The owners of this mine—Messrs. Glidden and Williams, of Boston, Mass.—are much encouraged by their present prospects, and consider it a very valuable piece of property.

The Same Vein of Copper

Passes through Amador county from north to south, and has been opened at several points, at all of which the same character of ores are obtained. This will soon be a valuable interest in that county, and would afford a large amount of business for a railroad.

PLACER MINES NEAR OROVILLE.—A dispatch from Marysville states that great excitement prevails in the vicinity of McConnell's Ferry, near Oroville, over the discovery of rich placer diggings. One claim was sold for \$2,500, and as high as \$6,000 offered for others, but declined. The new district covers a space of about four square miles.

"Wage-Laborers" in Massachusetts.

Wishing to find out the number and average earnings of the "wage-laborers" in Massachusetts, General Oliver and his deputy have made a thorough study of the United States census report of 1870, and have based elaborate calculations upon the figures therein given. It seems that there were then reported in Massachusetts about 550,000 male persons above the age of 10, and that about 450,100 of these had specified occupations. More than 320,000 of these are included in the tables of wages given by the Labor Bureau; besides about 90,000 women and girls, out of 123,000 put down in the census report as having some occupation. There are, therefore, more than 400,000 employed persons, whose wages and earnings are averaged in the volume before us. The general result is that, of skilled laborers, the men get, 280 working days in the year, average earnings of \$536½; the women earn, in the same time, \$237 each; and the children earn \$151; the average annual earnings for all persons being somewhat more than \$308. The unskilled laborers fall below this rate, and earn (the men) only \$422 a year—no figures being given for women in these employments. It must be remembered that these sums are all estimates of the result of computation. Whenever the actual earnings are returned, they are generally higher than these figures. For example, carpenters are set down as earning less than \$600, but one in Fitchburg, who returns his exact wages, gives \$962.50 for 275 days—the table showing only 262 days as the average working time. Laborers are set down as earning less than \$400, but one who returns his wages gives \$360 besides board—equal to at least \$460. In the same family one boy is plumber's apprentice, and earns \$260 a year, almost twice what the table allows him, which is \$135 only; and a second boy whose occupation is not specified, earns \$182, though the average of the table would give him but \$151. From these instances, and for other reasons that might be given, we conclude that the average earnings as computed by the Bureau are at least twenty per cent. too low.—*Christian Union*.

What Becomes of the Quicksilver?

What becomes of all the quicksilver brought to this State and used in our reduction works is a matter worthy of receiving the critical attention of some of our scientists. Quicksilver in large quantities is constantly being brought to the State and not an ounce is ever sent away. After it has been used in amalgamating the precious metals contained in the ores operated upon, it is separated from the metals with which it is combined by retorting and is again used in the amalgamating pans. Thus it is used over and over until it has disappeared. Whether it floats away with the water used in amalgamating or is lost by evaporation, there must be vast quantities of it collecting somewhere, as it is a metal not easily destroyed. In case it is lost by evaporation it must condense and fall to the ground somewhere near the works in which it was used, and if it floats away in the water it must eventually find a resting place on the bottom of the stream in which it was floated away. It is an axiom among millmen that "wherever quicksilver is lost, silver is lost;" therefore there must be a great amount of silver lost, as we shall presently see. The amount of quicksilver furnished mills in this section of the State alone by the Bank of California averages 800 flasks of 76½ pounds each, or 61,200 pounds per month. This in one year would amount to 734,400 pounds of quicksilver, that goes somewhere, and counting backwards for ten years shows 7,344,000 pounds that has gone somewhere, either up the flue or down the flume. The quantity of quicksilver distributed monthly among the mills shows just how much is lost. None is sold or sent out of the country with the bullion; therefore, if there was no loss, the mills would never want any more quicksilver than enough to give them a start at first, as the same lot could be used over and over, ad infinitum. But there is a loss and a very large one, as is exactly shown by the demand for quicksilver, as it all goes to supply the place of that lost.—*Virginia Enterprise*.

COAL AT LANCHA PLANA.—The Amador Ledger hears the most flattering reports from the coal discoveries at Lancha Plana and near Buena Vista. Samples of the coal have been sent to Sacramento and Stockton and other places, and experts have reported very favorably upon the quality. It appears that the top strata is a little hard and dull, yet makes a very hot fire. That taken from the third and fourth strata improves and works admirably in plain blacksmiths' fires. We feel highly gratified to think that little Amador county contains such promising evidence of future wealth, for when these coal deposits are properly opened and an easy mode of approaching a ready market obtained, the owners will become rich, a large number of workmen will have employment, and all the county be benefited. The Stockton and Lone Narrow Gauge Railroad will pass along the line of these valuable coal deposits and will furnish easy and cheap transportation to market. We understand that a contract has already been taken to supply one hundred tons of coal each to Sacramento and Stockton for trial.

Hydraulic in Plumas County.

The Hungarian Mining Company purchased the claims on which they are now operating a little less than a year ago, for the sum of \$50,000. They at once commenced the work of introducing all the modern improvements in hydraulic mining, and are now only getting into fair running order. The company have already laid out over \$40,000 in improvements, and are still under heavy expense. Thousands of feet of huge iron pipe have been laid, large flumes have been built, reservoirs constructed, miles of ditch dug, and still the work goes on. The company are now piping in what is known as Quigley's ravine, on the west end of the diggings, where they are opening a new claim. The flume here is in four sections, making a length of 1,800 ft. The flume is very substantially built, is four ft. eight inches wide inside the blocks, and on six inches grade works well with 1,000 inches of water. Two large undercurrents catch all the fine dirt, and it seems impossible for the gold to escape. Between the sections of flume are ground sluices, so arranged as to break up the dirt, which might otherwise pass off in "chunks." The bank of gravel at this place is from 100 to 200 feet deep, and contains gold from the surface to the bed-rock. Two large "giants" are worked against the bank, throwing some 900 or 1,000 inches of water. With a pressure of 300 feet these pipes keep the flume constantly filled to its full running capacity, and the bank seems fairly to melt before their almost irresistible power. Rocks weighing hundreds of pounds are tossed about the flume to land in the cañon below.

In the old workings on the north side of the claim the company have constructed a new flume three feet wide through the whole length of the tunnel, and at the lower end have placed undercurrents sufficient, it seems, to render the escape of gold impossible. The main pipe is finished to this point also, and two or three days work will place the remainder of the machinery in position to commence piping. Here the former owners did all their work on these claims, and from their noted richness, the yield under the present appliances must be immense. The company own some one hundred and fifty acres of ground, and from what we see and know of its richness, we believe it to be the most valuable gravel claims in the State.

THE MECHANIC.—Popularly the mechanic is considered to be a little more than a skillful handler of the tools of his specific trade, rarely or never being called upon to exercise the higher intellectual powers, such as reflection, reason and judgment. Very little thought, however, will convince any one that such a notion is far from being a correct or complete one. Correct, it may be, as far as it goes, but very incomplete. To dexterously use the hammer, the plane or the file requires long and tedious practice, and exact an extensive acquaintance with the nature of the material operated upon; the many mechanical and physical laws which govern the same, in numerous varied conditions and circumstances. The mechanic to be truly worthy of the name, should thoroughly understand the groundwork of the mathematics. At least, he should be an adept in the use of fractions, decimals, and the calculations of common ratios. Then again, sketching and practical drawing with the laws of light and shade are indispensable to a workman of even ordinary ability. These are a few of the many qualifications requisite to constitute a worthy competitor for the name of mechanic in the latter days of the celebrated Nineteenth Century. *Manufacturers Bulletin*.

LOCOMOTIVE CONSTRUCTION AT SACRAMENTO.—The new enterprise of constructing locomotives at the railroad shops in this city is no longer a doubtful one. The original order was to build ten freight locomotives. Lately this order was amended by adding, "and two passenger locomotives." Thus, twelve in all are to be built. Two-thirds of the iron work for these is already completed. The passenger engines will have 18-inch cylinders, the others being 17 inch. All the wrought iron work is being made out of scrap-iron, and in this respect, as in others, the locomotives will be superior to any made by Eastern manufacturers. The whole work is being done better than is usual in shops where locomotives are made for sale. Norway iron is used largely, which is an item of superiority. More general care is taken in the whole work than is usual. Exceeding strength and durability are the essentials aimed at. The heaviest of these iron horses will reach thirty-five tons, while none will fall below thirty tons. One hundred and fifty-four men in the iron works are now bending their energies to accomplish the rapid building of these locomotives, besides carrying on the general business of the shop. The whole is under the supervision, so far as the iron work is concerned, of one of the most methodical and careful of foremen, Lashella.—*Sac. Rec.*

DIABLO COAL.—The Antioch Ledger of April 12th has the annexed: "The vast amount of coal which has been taken from the Diablo range of mountains has given our county somewhat of celebrity as a coal-producing region, and there is no doubt that greater developments will yet be made. One writer has asserted, and substantiated with sound argument, that the coal veins of Diablo are but the outcroppings or upheavals of the great bed of coal which underlies this immediate section of the valley. The dip of the veins would indicate this, and the same is substantiated by the outcroppings found on the Montezuma hills opposite, in Solano county."

MECHANICAL PROGRESS.

Hints on Forging Iron.

An interesting book was published some time since, in England, containing much valuable information given to Government by the most eminent firms in that country, upon the subject of forging iron. A brief summary thereof may not be devoid of interest and value, as these sources of information are not often applied to by, or accessible to, the general public.

With respect to the best mode of securing from deterioration the store of raw iron, the opinion is expressed that it should be kept under cover, and exposed as little as possible to the influence of moisture. The best iron is that which is most frequently worked, or which in the manufacture undergoes the greatest number of processes at a welding heat; such as iron produced from re-manufactured scrap and old iron.

The cleaning of the scrap iron previous to manufacture is recommended to be done in the chainable cleaning machine as far as possible. By this means, not only will the scrap iron be perfectly cleaned, but the cleaning of the chainable will be facilitated by the increased attrition thus produced.

With reference to the means of producing sound smith's work, the most fertile sources of defects which from time to time have been experienced are:—(1) The original inferior quality of the iron; (2) Improper treatment in the forging; (3) Improper treatment of articles of smith's work in actual service. With respect to the quality of iron, that employed in the dockyards is generally of good quality, and only requires due care in its treatment to render the work produced therefrom equal to any legitimate duty required of it. With respect to the second cause of defects, namely, improper treatment in the forging; as this head refers to a very extensive class of defects, it may be proper to regard it, first, with reference to the nature of the forging; and, secondly, to the kind of coal used in the operation.

It being most important that every condition necessary for the operation of welding should be in the highest state of perfection, this requires that the iron should be at the right welding heat, rather than over or under it; so that, if any slight delay or impediment arise in bringing the parts together, there may be, as it were, a surplus of heat to work upon; and next in importance to this is, that as little scoria, or oxide, or other foreign material as possible should cling to, or interpose between the surfaces about to be welded. As the welding of iron is accompanied by its combustion, and by the production of an oxide in a melting state, we must altogether get quit of this interposing material, as, ere the two pieces are laid together, it has a tendency to form as rapidly as it is wiped off. But very fortunately, in almost every case, if due care be paid to the form and manner in which the surfaces are presented together, the instant the blows are given to the parts in question, the interposing scoria is forced off it, and the two perfectly pure surfaces of the weld ing-hot iron are so brought into intimate contact as to unite together and form one mass. There is no department of the art of forging more important than this, inasmuch as, in the majority of cases of defective welding, it is observed that the defect in question has arisen either from the scoria being shut up by means of improper forms of the surfaces, or that it has been inefficiently expressed from between the surfaces, for want of due energy and judgment in the blows of the hammer.

Secondly.—On the subject of forging it may be proper to refer to the kind of coal used in that operation. Much evil arises in this process from the risk of viscid and sulphurous scoria clinging to the surface of the iron, owing to the use of raw or impure coal as the material for the smith's fire. If the coal were of a pure quality, namely, such as contain nothing but carbon and its ordinary bituminous accompaniments, the evil alluded to would be less felt; but as all coal contains, besides earthy matter, more or less of sulphur, a class of evils arises which is of a very serious nature. When we attempt to weld together two pieces of iron which have been heated in a fire formed of very sulphurous coal, not only is the quality of the iron damaged by being rendered brittle, but also its surface becomes covered with a certain substance which in a very remarkable degree, destroys that adhesive quality which accompanies iron when at a welding heat. When this evil exists to excess, the parts will not unite, however much they may be hammered. But although such an extreme case as this is not frequent, yet it is a question of degree, and not of existence, so long as raw coal is used.

It is therefore advisable for those shops which admit of it, slightly to carbonize the coal previous to use. This is the practice in most private establishments where the quality of the smith's work is a prime object. The practice should be discontinued of making notches in the scarp of two pieces of iron about to be welded together, as such notches afford a lodgment for scoria, etc. Another extremely bad practice should be discontinued, namely, that of throwing a few fresh coals into a hollow fire on the hot iron, just before the heat is coming out.

It is recommended also to abolish cold

hammering, unless the articles can afterwards be annealed.

No Injury From Straining or Testing Iron.

The committee appointed to investigate the several matters relating to iron, etc., report that the result of their experiments clearly shows that very heavy testing strains even to the extent of the breaking strain (that is equal to the strength of the iron itself) and this even several times repeated, were found not only not to weaken the iron, but actually to increase its strength by every application.

"This fact," the committee says, "appeared so important, and so much opposed to the opinion of the best informed persons upon the subject, that in order to prove beyond all question, that the increased strength was due to the repeated previous strains, and not to the diminished length of the bars, we considered it proper to make experiments upon this point; we therefore took several bars of the same kind of iron, and of the same diameter, but varying in length from ten inches to ten feet, and found they were all equally strong. It may be proper to state the circumstances which usually attend the fracture of iron bars; namely, that considerable heat is evolved at the breaking place, and that the diameter of the bar is everywhere reduced, but particularly so at the place of fracture; but it is worthy of remark, that at the second and subsequent fractures of the bars, it generally happened that little or no heat was given out at the place of fracture, and that the general diameter of the bar was not again sensibly reduced, except in some instances, at the place of fracture."

Some of the results announced by the committee are somewhat remarkable. If they are right as to increase of strength resulting from the continued application of the breaking strain, what becomes of the modern doctrine of the "fatigue" of metals, and how are we to reconcile therewith the admitted action of the testing machine submitted to the Institute of Naval Architects in 1872?

Compounding Common Steam Engines.

A correspondent of *The Engineer*, asks, in view of the manifest saving in the use of the compound engines:—"What shall we do with our old engines?" After alluding to some proposed modifications brought forward by the engineers, in answer to this query, he gives his own as follows:

"My idea would be rather to attach a very small cylinder to each side of the large one, and connect them to the large one by a cross-head, let the steam into both of them at once, and the exhaust into the large one; proportion them so that with steam, say, at 50 lb. below them both and the exhaust in the large one, the same strain, and no more than what was before, for no more is needed, would be on the beam and connecting rod. Have no cut off for small cylinder, but follow the steam to the end of the stroke. By this means the old cylinder would be left as it is; perhaps an extra eccentric would be required to move the small valves. By this means I see no limit to the pressure that could be used. The greater the pressure the smaller the cylinders would require to be; the regularity of the engine would not be affected, the power would be applied exactly as before. No doubt the pressure would fail in the large cylinder as the piston neared the end of the stroke, but the steam following at full pressure in the small ones would help to balance the loss.

I have given my idea roughly it may be, and I will conclude by stating this: I have a cylinder 14in. which will drive the machinery at the proper speed with 25lb., but at this pressure the stroke ratio requires to be pretty open. I am of opinion a 10in. cylinder with 50lb. would do the same work with a third less coal, or by fitting a slide to cut off in the 14in. cylinder, say at a third off the stroke, would come to the same purpose. Were I using to put up the same machinery I would be inclined to put in a small cylinder, and use high pressure; the only thing I would lose would be I would be unable to increase the power of the small cylinder."

CAR AXLES AND JOURNALS.—A committee appointed by the Master Car Builders' Association to determine the most suitable form and size of railway axes, oil boxes and journal bearings, in order that a uniform standard may be adopted, state that larger axes, longer and larger journals and larger oil boxes than are now in use are desirable. A large axle, it is considered, would tend to lessen its liability to break; an increase in the length and diameter of journals would distribute the friction over a larger surface, facilitate lubrication and avoid delays by hot boxes.

A NEW CAR-SPRING.—The chief locomotive engineer of the Berlin and Gorlitz railroad has obtained a patent for a car spring which depends upon torsion instead of flexion, as in the ordinary plate springs, and which, it is claimed, is less liable to break, gives greater security, with twenty per cent. heavier load, is cheaper, and is easily attached to the car.

NEW USE FOR SULPHATE OF SODA.—Mr. W. Dingley, of England, has lately patented the use of sulphate of soda in the crude state of salt cake, for the purification of iron. A small quantity of the salt is thrown on the surface of the molten iron during the operation of the puddling—about 12 ounces being recommended for each heat of 4 or 4½ cwt. of metal.

SCIENTIFIC PROGRESS.

The Origin of Life.

Professor Haeckel of the University of Jena, who has won a name for himself during the past ten years as the author of several remarkable works in various departments of natural history gives the following facts in relation to the origin of life in mammals:

At the outset of his existence, man, like every other animal organism, is only an egg, a simple little cell, whose diameter is only one fourth of a millimeter—the one hundredth part of an inch—at the most. It differs from the primordial cellule of the other mammalia only in its chemical constitution and the molecular composition of the albuminous matter of which the egg essentially consists. And yet these differences cannot be directly perceived by any means at our disposal; but we are compelled by indirect conclusions to suppose their existence as the prime cause of the difference in individuals. The human egg incloses all the essential elements of a simple organic cellule; a protoplasm which bears the name *vitelus* and a nucleus or germinal vesicle. This nucleus is a small sphere itself, inclosing another nucleus much smaller still, the *nucleolus*; exteriorly the protoplasm is enveloped by a membrane which is known by the name of *zona pellucida*. The eggs of many of the lower animals, as the greater part of the mollusca, are, on the contrary, naked cells which do not possess this envelope.

As soon as the egg of the mammal is completely developed, it leaves the ovary and descends, by the narrow canal of the oviduct, into the uterus, where, after fecundation, it becomes an embryo. This transformation is thus brought about: The original cellule becomes divided into two cellules: on the primitive nucleolus are formed two new specks, and the nucleus becomes separated into two vesicles, each of which takes with it half of the protoplasm. The result of this process is that, in the heart of the vitelline membrane, which alone is not divided, two cellules are found in juxtaposition differing from the original only in being unenveloped. Each of these new cellules in its turn divided into two others, so as to form four, which in the same way become eight, these eight, sixteen, and so on; these successive segmentations producing an agglomeration of cellules, in outward appearance resembling a mulberry.

The further development consists in the cells assuming the shape of a sac, in the interior of which a liquid collects; shortly, on a point of the wall which is composed of these cells is produced a disk-like coagulation; their number rapidly increases, and this particular condensation becomes the embryo strictly so called while the remainder of the sack serves only for its nourishment. The embryo soon begins to broaden into the form of a biscuit. Three leaves or layers of cellules can be distinguished, superposed like envelopes upon each other, and each having its particular place in construction of the living being; from the exterior leaf is formed the epidermis and the central parts of the nervous system, the spinal marrow and the brain; from the central layers is formed the interior membrane which lines the digestive canal from the mouth to the anus, with all the glands that are attached to it (the lungs, the liver, the salivary glands, etc.); the intermediate layer is the source of all the other organs.

The processes by which the three layers of cellules give birth to the most complicated organs all be reduced: (1.) To new segmentations, and consequently to an increase in the number of the cells; (2.) To the divisions of labor or the differentiation of these cellules; (3.) To the combination of these cellules, differently developed.

Until the brain begins to show itself distinctly it is scarcely possible to recognize any difference between the embryos of the different vertebrata, or least of the three superior classes—reptiles, birds, and mammals.

THE COLOR OF MARINE WATERS.—Many local causes influence the colors of marine waters, and give them certain decided and constant shades. A bottom of white sand will communicate a grayish or apple-green color to the water, if not very deep; when the sand is yellow, the green appears more sombre; the presence of rocks is often announced by the deep color which the sea takes in their vicinity. In the Bay of Loango the waters appear of a deep red, because the bottom is there naturally red. It appears white in the Gulf of Guinea, yellow on the coast of Japan, green to the west of the Canaries, and black round the Maldivian group of Islands. The Mediterranean, toward the Grecian Archipelago, sometimes becomes more or less red. The White and Black Seas appear to be named after the ice of the one and the tempests to which the other is subjected.

SULPHURIC ACID BY SYNTHESIS.—M. Boillot announces that, by passing the electric current through a vessel containing a mixture of sulphur vapor and oxygen gas, he has effected a combination of the two, thus producing sulphuric acid by synthesis.

LIFE IN THE OCEAN DEPTHS.—The unscientific man is generally startled a little, when Agassiz tells him that "the ocean is the true home of animal life." He is so accustomed to think of the sea as barren and desert, that he "makes great eyes," as the Germans say, when the naturalist assures him that it is rather the land which is comparatively bare of animal life. The land, to be sure, is the habitation of the most perfect of animals, and, as it is besides the home of our own species, we naturally connect the idea of life with it rather than with the ocean. The land, moreover, affords more favorable conditions for the development of a greater variety of functions, among which is the faculty of uttering sounds, while almost all marine animals are dumb. The latter have such a quiet way, that we are apt to overlook them—the fate of quiet people generally.

But it is quite sure that in the number both of species and of individuals, the ocean far exceeds the land. We begin to realize this when we look down into a shallow, waveless sea, and observe the variety of creatures of all sorts—crabs, snails, worms, starfishes, polyps—each have their home among the sea-weed; and yet these animals which we are able to see in their submarine abodes, are nothing in comparison to the hosts of smaller creatures, imperceptible to our eyes—the infusoria, myriads of which the microscope brings to our view, and which are all, without exception, aquatic.—*Journal of Chemistry.*

THE AURORA AND THE ALL-PERVADING ETHER—COMETS TAILS.—A correspondent of the *Journal of Science* for April, suggests the possibility that the electric currents which give rise to auroras are propagated in the ethereal medium which is supposed to pervade all space, and that the spectrum of the aurora is, in reality, the spectrum of that ethereal medium.

The same writer suggests that it is not improbable that the tails of all large comets will be found to give spectra similar to that of the aurora, although additional lines may be present. This hypothesis is certainly a very interesting one, and one the solution of which will be looked for with much interest on the appearance of the next comet, which presents any very considerable caudal appendage. The tail of a comet, we believe, has never yet been observed by means of the spectroscope.

OZO-BENZINE—A NEW EXPLOSIVE.—M. Houzeau and Renard state, in *Les Mondes*, that by causing concentrated ozone to react upon pure benzene boiling at 178° Fahr., a solid body is formed of gelatinous appearance to which the name of ozo-benzine has been given. The formula is $C_6H_8O_3$ ($C_6H_6O_3$). Dried *in vacuo*, the substance becomes solid, white, amorphous and highly explosive. It detonates with violence under the influence of shocks or heat. A few grains exploded in the laboratory shattered the glass in the windows. It is very unstable, and when left either in air, carbonic acid, or even in a vacuum, it changes rapidly.

It has also been noted that a mixture of bicarbonated hydrogen and ozone detonates violently without the action of light, heat or electricity. The ozone must be strongly concentrated.

EXTENT OF METEOR STREAMS.—Astronomers now very generally accept the theory that the November and other periodical meteors consist of a vast number of those small bodies moving like comets, around the sun, and in orbits so eccentric as to cross that of the earth. They may move in vast aggregated numbers, or in streams more or less elongative. Some idea of the vast number of some of these meteoric streams, or aggregations may be inferred from the fact that it required six hours for the earth to cross the meteoric stream which was encountered on the 27th of November last. As the earth moves at the rate of 68,000 miles an hour, we must therefore infer that stream to be upwards of 400,000 miles in breadth and of unknown length.

NEW DETERMINATION OF THE VELOCITY OF LIGHT.—M. Fizeau communicates to *Les Mondes* the results of a series of very elaborate experiments made with a view of the most accurate determination of the velocity of light. The source of the ray was a jet of oxyhydrogen gas, and the distance between the two stations, as found by triangulation, was 33829.1 feet (about 6 miles,) with a probable error of 0.001.

Six hundred and fifty satisfactory observations were made, the mean of which, gave 185,368 miles per second as the velocity of light. This result agrees with that determined previously by Foucault. M. Fizeau considers that, with stations separated a distance of 12 miles, the velocity of light could be determined to an approximation of 0.001.

STABILITY OF BLUE COLORS.—Professor Chevreul, a French chemist, who is high authority on such subjects, in a recent paper mentions that while the blue colors obtained from indigo are permanent, those from Prussian blue will not resist the action of soap, though equally unaffected by light and air.

PLATINUM BRONZE.—H. Helouin proposes the introduction of a platinum bronze for the manufacture of cooking utensils. It is said to be entirely inoxidizable. The proportions are; nickel, 100; tin, 10; platinum, 1.

PHOSPHORESCENCE OF ORRIS ROOT.—Landerer has discovered this phenomena repeatedly while digging for the root at night. The phosphorescence occurs in the form of luminous spots.

barren quartz and in much better working ground. Air pumps are now working in the incline. Expect to get the water out to commence sinking to-night or to-morrow.

Golden Chariot.

Letter of the 15th says the sixth level drift south has passed through the crosscourse and now has an 18 inch vein of very rich ore. It is fine development. The eighth level drift also shows some fine ore. No change in winze or fifth and ninth levels.

Hale & Norcross.

The weekly report for the week ending on the 19th gives the following summary of operations: Ore extracted from the lower mine—second station level, 223 tons; twelfth station level, 92 tons; ninth station level, 45 feet; tenth station level, 29 tons—total, 399 tons. Delivered to mills, 363 tons 1030 pounds. On hand, 604 tons 980 pounds.

Imperial.

The accident to the hoover was caused by a portion of the woodwork on the inside breaking loose, slipping the gear and smashing things generally. It has been repaired temporarily, and will try and keep it going until the arrival of another. But little has been done during the week in the mine.

Letter of the 21st says there is no material change in the appearance of the mine. Are getting along finely with the machinery, and will, without doubt, start the perpendicular shaft this week.

Julia.

Letter of the 17th says the south drift continues to improve. The ore is looking well—not very large but will pay for milling. There is nothing new in the north drift, pushing ahead, and making excellent progress. The rock is very soft, and considerable water is coming in the face of the drift. Everything looks well and very favorably.

Justice.

Letter of the 20th says they have made average progress during the past week, as follows: North works, main south drift 315 feet in hard quartz, with an increase of water from the west side. Crosscut number two, last 35 feet in quartz and porphyry. In the former the strata became more regular as they approached the Cedar chimney. In South works, main drift south, 211 feet have been made, and it is looking better, all ore, one-half good for milling. Winze in main south drift, 74 feet below the second station, in low-grade ore, with rich pockets. Crosscut east in the main south drift 43 feet with streaks of ore. Main incline 54 feet below second station in west wall, and ground sinking. The work is pushed with all energy to gain the depth for the station to run north for the 100-foot level in north works.

Lady Esten Tunnel.

Letter of the 14th says the track iron arrived on Friday, and was laid on Saturday last. The rock is rather hard, and is of a grayish lime, containing a large amount of pyrite of iron. A soft streak has made its appearance in the face, near the floor of the tunnel, of red oxide of iron, about six inches in width, and carries with it a small amount of silver, the same as the pyrite. The indications are rather encouraging.

Mammoth.

Superintendent's letter of the 17th says the mine continues the same as last reported. Looks like a large body of ore coming in. The snow is disappearing fast, and I think we will be ready to haul ore to the mill soon.

Overman.

Letter of the 19th says this week they started to put in a plunger pump at the bottom of the shaft, but owing to the strong head of water were compelled to stop until the head of water becomes further reduced. Have made during the past week 30 feet in our west drift and 25 feet each in north and south drifts, making a total of 85 feet of drifts for the week.

Pioche.

Letter of the 20th says the east drift on the bottom proved so hard and discouraging that they concluded to stop it. Will let contract to sink the incline 50 feet deeper. Will start sinking to-morrow. Are getting out some very good ore.

Raymond & Ely.

Dispatch from the Superintendent dated the 21st says: "I shipped on the 19th, \$35,323." This makes the total amount for the month, so far, \$135,942. Dispatch of the 21st from the Superintendent says: "I shipped yesterday, \$40,348." This makes the total amount of shipments for the month, so far, \$176,290.

Silver Peak.

Letter of the 17th says they are now shipping ore to the Meadow Valley mill regularly, and expect to begin crushing next week. The ore-breasts continue to look well, and the mine gives fair promise. The average samples for the 14th were \$100.53 per ton; for the 15th, \$109.95. These assays, from the manner in which they are taken, should show very well what the ore will pulp at the mill.

Letter of the 19th says there is no particular change in the mine. The east drift still continues hard, but the ore is good and maintains its full width. The west drift looks about the same. Average samples for the 17th were \$100.53 per ton. Have hauled about 33 tons of ore to the mill, and will get the haulage as soon as possible, and it will be crushed as soon as hauled.

Savage.

The weekly report for the week ending on the 19th gives the following summary of operations: Ore extracted, 474 tons; forwarded to the mills, 1,224 tons; assay value of the ore, \$31.38. The ore came from the second station of the north mine.

Silver Hill.

On the 17th shipped to the Bacon mill 72 tons 350 pounds of ore. Letter of the 19th says they are making fair progress in the north drift, second station, but find the rock is very hard. The ore in both the north and south drifts is looking well. Everything is running smoothly. Ore shipped to the Bacon mill on the 18th, 63 tons 300 pounds; on the 19th, 48 tons 400 pounds.

On the 21st inst. shipped to the Bacon mill 78 tons 1,750 pounds of ore. On the 22d they shipped to the Bacon mill 63 tons 500 pounds. An assay on that day gave a value in silver of \$14.92, and in gold, \$18.85—total value per ton, \$33.75.

Sierra Nevada.

Letter of the 19th says they cleaned up the batteries of the mill on the 15th and shipped to the Mint on the 17th 250 pounds of bullion. We worked 993 tons of ore. The returns have not come as yet. The mill is in an excellent condition. The mine is looking fully as well as at former period. We are getting some low-grade ore, in north workings from up-rails. Expect it will improve. The northwest streak holds about five feet wide, and prospects are about as usual; have put the same streak 50 feet above, four feet wide, and prospects good. The main tops about the same.

Wellington.

Letter of the 17th says the total shipments for the last month have been about 160 tons of ore. Are not taking out much ore at present, as it can be done cheaper soon. Indications are good for another strike of ore within the next three or four days in the third west level.

MINING SUMMARY.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned:

BUTTE COUNTY.

MINING EXCITEMENT.—Butte Record, April 19: Considerable excitement has been created by the discovery of rich diggings in the valley below Oroville. Ten and twenty dollars per day have been made with a rocker, and from 50 cts. to \$2 have been found in a bucketful of dirt. Everybody is locating claims, and the valley on which Oroville stands and for miles beyond, seems to have established its character as mineral ground.

CALAVERAS COUNTY.

OWIN.—Calaveras Chronicle, April 19: The work of sinking the south shaft in the Owin mine 100 ft. deeper—making 700 in all—is progressing rapidly. About 20 ft. of the distance has already been sunk, and the contractors are pushing the shaft down as rapidly as a constant application of muske, picks, drills and giant powder will permit. A very pleasing feature connected with the sinking is the fact that the ledge is improving in thickness and quality of rock as the shaft deepens. At the 600-ft. level, the initial point of the present sinking, the ledge is about 6 ft. wide, and is as solid, well-bedded and rich body of ore as any yet uncovered on the coast. Meanwhile there is no falling off in the yield from the batteries, the average production of the mine amounting to fully \$1,000 per day. Since the above was in type we have been shown some of the richest specimens of quartz, taken from the bottom of the shaft, that we ever saw. The ore was covered and filled with free gold that it was almost impossible to break it up in mortar.

WEST POINT DISTRICT.—The Bald Mountain Gravel Company, at West Point, resume work on their tunnel this week.

Zacatoro putting up hoisting works on main shaft. Shaft 242 ft. deep; sinking and running levels will be resumed as soon as the hoisting works are completed. The Harding and rich body of ore as any yet uncovered on the coast. Meanwhile there is no falling off in the yield from the batteries, the average production of the mine amounting to fully \$1,000 per day. Since the above was in type we have been shown some of the richest specimens of quartz, taken from the bottom of the shaft, that we ever saw. The ore was covered and filled with free gold that it was almost impossible to break it up in mortar.

LONG STAR CRUSHING NO. 1. Ore at Carlton's mill. Working level.

Pancho mine improving. The ore on the dump is rich in free gold. Handsome returns to the parties who contracted to work the mine on shares.

The Woodhouse is still adding good milling ore to the large quantities already on the dumps. Several mines are expected to change hands in a short time to parties who are able to work them as they ought to be.

RAILROAD FLAT DISTRICT.—Anderson mine stopping, and crushing ore at Clark's mill.

Book & Co. have discovered a valuable mine near the Chapman, south of the Negro ranch.

Many are prospecting near the Esperanza creek, with very promising results.

MOQUOQUE DISTRICT.—Work is being pushed forward on the Good Hope.

Cheney is sinking winze in tunnel. Plenty of fair milling ore in sight.

DOLLY VARNEN extending levels, which contain some very rich ore.

THE VALENTINE is being re-opened for legitimate purposes.

BLUE MOUNTAIN.—We learn that the snow has nearly all disappeared in the vicinity of Blue Mountain, and that work will speedily be resumed upon the Heckerford, Imperatrice Eugenie and other silver mines located at that point. The Heckerford mine was considerably damaged by the great fall of snow in that altitudinous region. The roof was crushed in and the building otherwise injured. As soon as the damages can be repaired active operations will be pushed vigorously forward.

MINES.—Cor. from Angels: Our mines, as a general thing, are looking well. They have commenced to sink on the Sticks claim. The shaft is now down 273 ft., and I understand that it is the intention of the Company to sink to depth of 300 ft.

The adjoining claim to the Sticks, owned by Robert Leeper, is being rapidly re-opened. The mine has just completed his mill, containing 3 stamps and 6 arrastras.

PLACER COUNTY.

ST. PATRICK.—Placer Augus: This Co. cleaned up on Wednesday, giving as the result of a ten days run on rock from the Crest Mine, the sum of \$8,350. They crushed 173 tons of rock, and the mill and mining expenses were \$3,750, giving as a net yield for the ten days the sum of \$4,600, or an average of \$450 per day.

The Bellevue Company are taking out some splendid looking rock.

The Yolo Company's mine is said to be furnishing an abundance of good rock and some very rich specimens.

The Dardanelles claim at Forest Hill cleaned up last week, after a run of three weeks, about \$7,000, having employed during that time from eight to ten men.

Work is progressing on the Jersey claim which is yielding fine usual good pay.

The Big Spring have completed their tunnel, to connect with the Dardanelles tunnel, which gives them good air and drainage. They have struck good pay.

MINING NEWS.—Placer Herald, April 19: The Rising Sun mine lately cleaned up from a five stamp mill, on a run equal to fifteen days, \$5,200 in gold. They are down on this mine over 300 ft. and have a ledge nearly 2 ft. thick, and will now run the mill night and day.

The Yolo mine, in the same vicinity, is again at work with good prospects. The new Quartz mill of the St. Lawrence company is approaching completion, and the company has a number of fine ledges prospected so as to insure good pay as soon as the mill starts.

The Butcher Boy company have again commenced work on their ledge. They have been on extremely hard rock in going down 85 ft., and will now drift on the ledge to a better position. This ledge prospects well. On the Yolo claim, 3 miles northwest of here, work is progressing rapidly. The ledge is now stripped and broken down 3 or 4 ft. deep, for some 60 ft. on each side of the shaft, which is now down 70 ft. on a good ledge which dips nearly at an angle of 45 degrees. In tracing and breaking down the ledge last Saturday, the boys picked up about \$300 worth of specimens, one piece being about the size of the crown of a hat, containing fully \$300 in gold.

The Auburn mine is working ahead with great energy. In this mine, 180 ft. deep, they have in sight plenty of very rich rock, but are endeavoring to fully prospect the mine before arranging to build a mill.

TUOLUMNE COUNTY.

EUREKA.—Tuolumne Independent, April 19: It is rumored that this mine at Summerville is soon to be opened. This mine was last worked, we believe, in 1868. For a trifling sum a new shaft can be put down from the end of the old works, to strike the chute at the 500-ft. level, where, no doubt, the pay-ore would be found as rich as before. It is estimated that a clear profit of \$70,000 was realized during the time this mine was worked.

LOUISEVILLE.—In this claim, the water is out and the miners have commenced taking out ore. This company are also about to commence on another ledge, owned by Lombardo, which is on the Mastodon, or mother lode of Orochero, owned by the Smith Brothers. They will tunnel in from the creek on the lode, and take out ore. This will be crushed at the Grizzly mill, which the Co. have leased for 12 months. The lode here runs 7 to 15 ft. in width, and will pay a good profit, even at \$7 per ton; but it is expected to go largely in excess of this figure, and it can be obtained in unlimited quantities and is easy of access.

RISING SUN.—Messrs. Hill & Crahtie inform us that

they have changed the name of their claim from the Hill or Wildcat, to the Rising Sun, in which name it is recorded. The rock grows richer the further they go, and now pays \$45 per ton, with good prospects of its keeping up increasing.

SOUTHERN.—Work in this celebrated mine, at Southleyville, is being rapidly pushed forward. The contract for sinking the Davidson shaft 40 ft. is finished. This takes the shaft 420 ft. below the surface, on the vein all the way, and sinking still continues. The south shaft, known as the old Southley shaft, 1,200 ft. south of the Davidson, has been thoroughly repaired and shored out, and sinking is again working in new ground. This shaft is about 100 ft. deep. Old practical miners who have before worked at this point, are satisfied that this part of the mine will prove as rich as in the past. The claim embraces 2,400 ft. of the vein, and the middle shaft, between those named above, is 400 ft. deep. In two tunnels above the bottom, or at a point 220 ft. beneath the surface, the miners are now working in new ground, and taking out rock which is estimated will pay \$40 per ton.

Nevada.

BELMONT.

MONITOR MINING CO.—Reese River Review, April 19: Work in the Monitor is progressing steadily and successfully. The mine is producing large quantities of fine ore. Good developments are being made 100 ft. below the lower tunnel level.

BELMONT CO.—This Co. is taking out splendid ore from the big chimney north of the Canfield incline and shipping the same to the Monitor-Belmont mill. Their new hoisting works over the Highridge mine will soon be ready for work.

EL DONADO SOUTH CON. CO.—The greatest feature in this wonderful mine at present is the immense body of sulphuric acid, which is the 300-ft. level north of the main incline. This same chimney has been cut into in the 400-ft. level, said level being already 30 ft. in the body of the ore. A winze sunk from the 340-ft. to the 400-ft. level is all in this immense ore body. Stopping has commenced 140 ft. from the incline on the 30-ft. level, raising in the chimney of ore, the character of which astonishes the oldest ore shapers. The ore is black sulphuric, very friable in its nature, and is thoroughly impregnated with native silver; break it where you will and the face of the pieces are completely coated over with quite thick leaves of the native stuff. The ore averages over \$2,000 per ton by assay. The whole ore stratum will work in the mill \$250 per ton. It is hard to estimate the vast amount of ore lying in this chimney between the two lower levels. There is certainly sufficient to run the Co.'s 20-stamp mill for months to come. The south slope is looking finely. The breast of ore in this slope has measured 6 ft. and will average at least \$125 per ton as it comes out. The south body of chlorides still looks well and is producing splendid ore. Although they have had some delays, this Co. has shipped on April account so far some \$50,000, and will ship \$100,000 more yet this month.

WHITE PINE.

EBERHARDT & AUBURN.—White Pine News, April 19: Since our last report we visited Treasurer Hill, and made an examination of a portion of the workings in the North Aurora, above the level of the Peers Chamber. The drift running from the Ladies' Chamber, south, 154 ft. strikes a body of ore 30 ft. below the Central Shaft, which runs across the main channel, or east and west. The vein has been followed east a distance of some 30 ft., discovering a fine body of high grade mineral. The body of ore found, will more than pay the expenses of running the drift through hard limestone. Returning along this drift, the Ladies' chamber is reached, from which a drift is being run east. Here another and convincing proof of the downthrow which has occurred on the Hill, is manifested by a wall as smooth as paper, plainly showing the immense friction which at some period of the past, has ground the solid wall to its present condition. It is neither a foot or hanging wall, simply the dividing line between the solid mountain and the broken masses which abound on the north. A piece of ore taken from this drift, which looked rich, prompted us to have an assay made by our friend Towne, of the Manhattan mill. The result was \$2,351.62; and quite a respectable "butter" was returned to the City of New York. We did not endeavor to pick out choice pieces, but knocked it out at random from a vein 12 ft. wide. Teams are constantly at work hauling the ore from all the workings of the company, and the Stanford mill is pounding away with its 30 stamps, down at Eberhardt. There are now 250 men on the payroll of this company, and more being added every day.

HAULING COMMENCED.—At last the roads are opened to the Hill, and the accumulated ore on the various dumps will soon be at the mill. On Wednesday last the first load of the season was hauled from the Ward Beecher mine to the Manhattan mill. It is with gratification we record the commencement of active milling operations, and Captain Turner, the Superintendent, assures us that he means to keep the mills of the district running the entire summer. The recent discoveries in the Edgar and Hidden Treasure shafts are guarantees of a sufficient quantity of ore to furnish the Big Smoky, Manhattan and Dayton mills with all the work they can do.

WASHOE.

ARIZONA AND UTAH.—Gold Hill News, April 19: Sinking the shaft is making good progress, the rock in the bottom blasting and working well. The flow of water continues much the same as in former reports, but gives very little trouble, the pumps handling it with perfect ease.

ALAMO.—Sinking the shaft is making good progress, although the ledge requires steady, hard blasting. The quality of the ore continues excellent.

BELCHER.—Daily yield over 500 tons. About 110 tons comes from the 1,300-ft. level and the rest from the levels above. The stopes and breasts are all looking nicely, with the prospect of a long continued yield ahead. The south drift at the 1,500-ft. level is being timbered, and when this is completed, drifting farther south will be resumed. The main incline is down 110 ft. below the 1,200-ft. level, the bottom in very hard rock. The drift south from it into the 1,200-ft. level is in 232 ft., and the drift south to connect with it is in 382 ft. from the Crown Point. About 160 ft. of drift remains to be done in order to make the connection.

BUCKEYE.—The daily yield of the mine continues about the same as per last report, keeping the mill steadily running. There is but little change in the ore producing sections of the mine, which continue to look well and yield finely.

BALTIMORE CO.—The main west drift at the first station is still driven ahead in very favorable looking quartz and vein matter, portions of the quartz showing ore of a low grade, with a steady improvement in both looks and quality as the ledge is penetrated.

OWNON POINT.—Daily yield, 550 tons, the best portion of which comes from the 1,300-ft. level. The other levels above are also yielding well, and everything in and about the mine is running very smoothly. Excellent progress is made with the incline, which is nearly low enough for the 1,500. Some little water is coming in, but not enough to seriously interfere with the work. The 1,500-ft. level will probably be reached without pumping. The drift south at the 1,400-ft. level is also progressing well, with the face in dry, hard, barren quartz. The cross-cut east from the 5th floor above the 1,300-ft. level, 100 ft. from the Belcher lino, has run out of ore into porphyry, but still shows indications of more ore.

CHOLLAR-POHOSH.—Daily yield 150 tons of ore, the assay value of which is \$33 per ton. The ore breaste in different parts of the mine are all looking well, and yielding well. The prospecting drift at the 4th station affords no change of interest for the week.

CON. VIRGINIA.—The shaft is down 340 ft. below the 500 ft. level, in good working ground, the sinking

making excellent progress. The main north drift on the 1,167 ft. level from the Gould & Curry shaft is making excellent headway, notwithstanding the intense heat attendant in so long a drift at so great a depth.

CALCROSS.—There is little or no change whatever in the ore producing sections of the mine at the first station. The main west drift at the second station is making excellent headway, the rock in the face continuing to blast and work finely.

DANEX.—Sinking the shaft is making excellent progress, the rock in the bottom working well. It is now down 45 ft.

EMPIRE.—The prospecting work on the lower levels progresses as usual, with but little change during the week, the developments continuing to increase the prospect of soon affording a dividend paying mine.

GOULD & CUR Y. The new pump in the incline are nearly completed, and will be ready to commence the work of draining the water in 2 or 3 days more. The north drift from the main east drift along the line of the ledge on the 1,500 ft. level, has developed a large body of fine appearing quartz, which contains but very little ore. The main drift south on the 1,600 ft. level, in connection with the north drift from the Savage, is still driven ahead, making fair headway, and nothing new to report.

GRAND.—The up-rails from the main tunnel, to connect with the old upper works is progressing at the rate of about 5 ft. per day, still raising through good ore.

HALE & NORCROSS.—There has been but little improvement in either the daily yield or the quality of the ore extracted since our last report. The ore-breasts between the 1,400 and 1,500 ft. levels, if anything continue to show less favorable. Prospecting the 1,700 ft. level is still continued with good results, but no change of material value to report.

JUSTICE.—The main south drift on the 400-ft. level is making excellent progress, showing some fine ore and giving promise of still better developments ahead.

KENTUCK.—Prospecting the 1,300-ft. level, with no change of material value to report.

KICKERPOCKER.—The main west drift on the 480-ft. level is still being driven steadily ahead, the face of the drift in clay and quartz, showing occasional streaks of low grade ore.

NEW YORK CON.—Sinking the shaft is making excellent progress, the rock working much softer. The quantity of water is about the same as at last report, and still considerably impedes the progress of the work.

NEVADA.—Still sinking in the ledge in milling ore the full size of the shaft. Fine prospects ahead for a good mine.

OVERMAN.—Cleaning out and preparing to again commence sinking the shaft was begun yesterday morning. The main west drift on the 1,000-ft. level is still pressed vigorously ahead, with no change of interest to note.

PILVER HILL.—Extracting ore from the first station has been steadily running during the week. It was found necessary to stop work in the north drift at the first station to connect with the south drift from the Justice on account of bad air.

SAVAGE.—The ore is nothing new to report of the developments in the west crosscut, from the main south drift on the 1,000-ft. level, down to the 1,500-ft. level, to connect with the south drift from the Gould & Curry 1 making fair progress, considering the great heat encountered, and difficulties of ventilating at so great a distance from the main shaft. The main south drift on the 1,700-ft. level is still pressed vigorously ahead, with some favorable indications of ore, but nothing of material value to report as yet.

SIERRA NEVADA.—There is no material change in either the looks or daily yield of the ore-producing sections of this mine during the week. The mill is kept steadily running, crushing ore from the mine at the rate of 60 tons per day.

SUCCESS.—The mill was again started up during the week, and ore from the mine. The developments in both the shaft and drift of the ledge, in the new shaft east of the mill in the canon, continue favorable, showing considerable quantities of fine ore.

UNION CON.—The north drift from main west tunnel is in 210 ft., running the whole distance through solid quartz; 200 ft. in from the mouth of the drift a crosscut has been run, showing the ledge to be 18 to 20 ft. in thickness and containing low-grade ore that assays from \$10 to \$15 per ton.

WOONVILLE.—The Ramsdell mill started up on ore from this mine about the first of the week, and the lone mill will also start in a day or two more, when some good returns may be looked for. The mine is looking well throughout, the levels both north and south showing large quantities of good material ore. Superintendent Curtis is getting the mine into the best possible working shape, with a view to taking out plenty of ore to keep both mills constantly running. About 30 tons per day are being required to supply them. Other mills will also be set to work as fast as procurable, it being the intention of the company to mill 40 or 50 tons per day. This ore will pay over \$50 per ton under the stamps.

Arizona.

MINING ITEMS.—Arizona Miner, April 5: Messrs. Lount & Allyn, on their gulch diggings near Hassayampa creek, last week took out \$250.

Cole & Johnson, on Lynx creek, in the class they bought from Wm. Crawford, took out up to last Sunday, \$700.

Lovejoy & Co. were averaging \$20 per day to the man, in their hydraulic claim.

Jesse Jackson arrived Thursday evening and reports that his company had crushed 40 tons of War Eagle ore at the Dol Pasco mill, which had paid very well, and they have some 50 tons of selected ore on the dump, estimated to be worth \$50 per ton.

A silver bar from the Mineral Park mill, weighing 15 lbs. 4 ozs. had just been received at Cerbat by Cory & Potts.

Montana.

BIGH STRIKE.—Herald, April 10: We learn that at a depth of 96 ft. on the Fry Agate mine, on Ten-Mile, the vein is three and a half feet thick, and assays \$2,897 in silver, per ton.

Washington Territory.

TIN MINES.—Walla Walla Union, April 5: During the week we have been shown samples of what is claimed to be tin ore. The substance is reddish in color, entirely free from grit, and is about as hard as a piece of castile soap. Persons have been tried burning it, and brought out blisters and drops of metal that look like lead or leaded tin. Samples of it have been sent below to be tested, and we may expect to soon hear what it really is. The mine is situated at the foot of the Blue mountains in Mr. Orley Hull's neighborhood. It is easy of access to the Valley, and is not far from timber, while the ore—whatever it is—seems inexhaustible in quantity. A number of our citizens have staked off claims of the ledge, but as yet do not seem to know exactly what value to place on "feet" in the new tin mine.

New Incorporations.

PIONEER GRAVEL M. CO.—April 14. Object: to mine at Iowa Hill, Placer county. Capital stock, \$2,000,000 in shares of \$100 each. Trustees—R. H. Rodgers, H. O. Macy, A. A. Jennings, C. W. Keeney and H. M. Lund.

SAN LUIS OBISPO RAILROAD CO.—April 19. Certificate of incorporation filed in Secretary of State's office, in Sacramento. Object: the construction and maintenance of a narrow-gauge railroad from the town of San Luis Obispo to deep water on the Bay of San Luis Obispo. Estimated length of road, 10 miles; ten miles; capital stock, \$100,000; principal place of business, San Luis Obispo. Directors—W. S. Chapman, William M. Stowe, Henry B. Tichenor, David Norcross, Charles W. Dany, Edgar W. Steele, William L. Beebe: \$14,000 of the capital stock has been actually subscribed.

Agricultural Progress.

The Agricultural Department at Washington.

No department within the whole range of Governmental business has been able to make so good a showing, for the money expended, as has that devoted to the great interest of agriculture. We herewith present our readers a faithful and beautifully executed engraving of the Agricultural Department Buildings and grounds at Washington. The main structure, a fine specimen of architecture, substantially built and well calculated for the purpose to which it is devoted, and the extensive and elegant conservatories connected therewith have cost the country less than \$200,000. The appropriations for carrying it on have also been expended with the same regard for economy; and although quite inadequate to the importance of the enterprise, they have nevertheless been made to accomplish an incalculable amount of good.

For many years the labor of the Department was purely one of love, it having been initiated and carried on for several years in the basement of the Patent Office, by Hon. H. L. Ellsworth, as an extra official duty to that of Commissioner of Patents. The first appropriation was only \$1,000; but that small sum was made to do the most it could, under the enthusiastic industry of that excellent officer. Happily, his successors in office continued the work with an almost equal interest and zeal, until May, 1862, when it was formally organized as an independent Department.

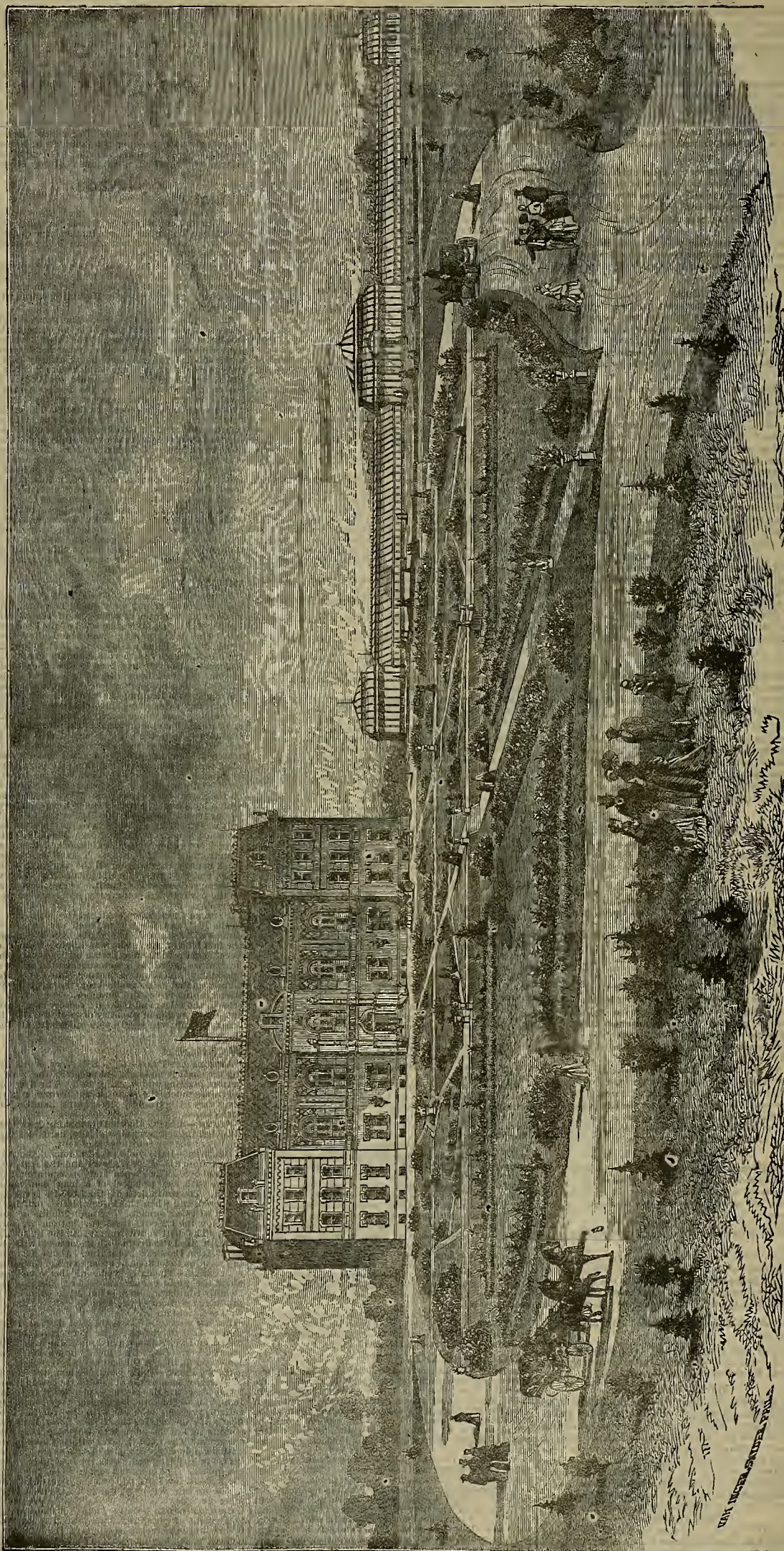
It is most singular that the leading men of the nation, many of whom are more or less connected with the farming interest, should, even now, be so strangely neglectful of the claims of agriculture—an industry far overtopping any other in importance and magnitude, and in the number of people directly engaged in it. If the Department of Agriculture had done nothing more than to arouse the dormant spirit of our farmers into the fact of the importance of their calling and of the possibility of its indefinite improvement, it would have already achieved a great work. It has not only done that, but in addition, it has spread abroad an amount of practical information, which has already returned to the country millions of dollars where only thousands have been expended; it has elevated the farmers' calling, and placed it on a level with the most favored industry in the land. It is to the influence which has gone out from this department, more than to any other single cause, that agriculture within the last twenty years, has been raised from a species of drudgery to the dignity of a science, calling to its aid not only the best inventive talent of the country, but the highest order of intellect to enable the farmer to pry into the very arcana of nature, and bring forth its inmost secrets, to the end that he may not only rightly appreciate them, but so order his labor and his appliances that they shall strictly conform to the requirements of the work he has in hand.

This new phase of the industry has introduced into its ranks men of superior intelligence, men of comprehensive and executive minds, who are fast elevating it to a power in the land—a power which will soon overshadow all other interests, one which will be felt not only in our State Legislatures, but in the halls of our National Congress as well—the one only power which will be found able to cope with and control the great evils of monopoly and corruption, before which the people now stand helpless and dismayed.

The very occupation of the farmers has a tendency to elevate and purify his mind. His dealings with Nature must, per force, be honest and true—nature cannot be cheated, she will not yield to wiles and subterfuge. The farmer, in this respect, ranks where he belongs—with the scientist, who also deals with nature. Search the world over; go among all the callings in which men are engaged, and where shall we find more uprightness, more true love of country than among farmers and scientists?

It is one of the most encouraging signs of the times that this class of our population is coming to the front not only in social, but also in political life; and it is the duty of every honest citizen to encourage and give his aid and support to the Department at Washington, which is laboring so faithfully and so zealously to elevate and render still more powerful and useful this great conservative element in our social and productive economy.

HOW TO IMPROVE CONVERSATIONAL POWERS.—In the first place have ideas and information as stock in trade, then impart those ideas and that information in the most felicitous style you can command to some appreciative listener, who will send you back as good as you give. Monologue and conversation are quite unlike. A conversationalist will divide the time with his interlocutors, and continually say something to elicit their ideas while giving expression to his own. Copious readings in Macaulay, Addison and our best American essayists will give fluency and elegance of diction. In this art practice is all important.



THE AGRICULTURAL DEPARTMENT AT WASHINGTON, D. C.

USEFUL INFORMATION.

House Furnishing as an Art.

We have plenty of elegant houses in all our large cities and their surroundings, but few homes; plenty of furniture, but few comforts; plenty of food, but poor service; plenty of dress, but small comfort in wearing it. Why is all this? With all the means of elegant, and comfortable, and healthy living, why this universal unrest? We cannot answer our own questions in detail, but will add a few words on the uses of furniture in promoting the health and happiness of a family.

First, let all furniture be selected, primarily for use, secondarily for decoration. To furnish your front hall so elegantly as to feel obliged to take your company in at the basement door, would be no greater folly, than to furnish your parlor so expensively that you stand in mortal fear the moment you open its doors for use, or throw open its windows for light and air. The country "Anut," whose "best room" was too nice for "ordinary company" made so many enemies by her invidious distinctions, that her best room, small as it was, was ample to hold all the friends she had left, by the end of the first years experiment. A good rule in furniture, as in dress, is, never to buy an article which your means will not allow you to use on all proper occasions, and replace, when, by reason of use, its utility or beauty has been destroyed. Second. Harmonize the different articles in each room, or suit of rooms, and balance the whole household around one central thought, so that you can exhibit your house as a whole, without shaming the meagerness of one department, by the richness and display in another. Let comfort guide you in every selection, your own, rather than your neighbors, your children's rather than your own, if either must yield, and you will have a home, where good taste will never be offended, and where earthly happiness may reign undisturbed.—*Cabinet Maker.*

Names of Various Sorts of Tea.

The designations by which the various sorts of tea are known in the market may be worth notice, as coming under the more immediate observation of dwellers at home. Congo is a corruption of Kangfu, signifying labor, and the Morning Congo advertised by tea dealers is simply a sort of the same tea grown at Wuning, a district and city the name of which, being interpreted, means "military rest." Souchong signifies "little sprouts;" Pekoa, "white down;" Bohea is derived from the Wukie Hills on which it is produced; Oolong means "black dragon;" Huangmoy, "red plum;" Campti, "selected firing;" Hyson, "fair spring;" Twankay, taken from Tunkee, or "Beacon Brook;" what is called "Young Hyson" is in Chinese termed Yutseun, or "Before the rains;" Gunpowder the Chinese call Yuen Choo, or "Round Pearls." There are a number of other names given to tea, but these will be recognized as those most familiar to the European ear. What are termed "chop names," are the fancy designations given by Chinese dealers to their teas, after having been made up into parcels of many hundred chests each. The tea is grown in the first instance by small farmers, who carry the produce of their respective gardens to the nearest depot, where it is collected by brokers, and by them made up into chests for delivery to the dealers, who convey it for sale to the foreign mart. These dealers are very particular in the selection of high-sounding and felicitous titles for their several parcels or chops, and very often a particular chop acquires such a fame as to be eagerly sought after for each successive season.

A Singular Cause of Fire.

The Cleveland (O.) *Ledger* publishes the following: A hard wood plug had been put into a hole in a gas pipe that ran along the ceiling in our job rooms, several feet from any burner, and in a position where no one could ever suppose it would catch fire. About six inches below it, passed a batt running from one pulley to another, and in operation during the day. About four days after the plug had been driven into the pipe, it was noticed to be on fire, and a bright jet of light, as if from a burner, burst forth from the side of the plug, which was already charred and being rapidly burned up. How the plug caught fire, how a steady flame of light could suddenly burst out from the side of it, was of course a subject of anxious inquiry. No one had lighted it and no fire had been used near it. The only conclusion possible was that it was caused by electricity from the belt, and a full investigation confirmed this conclusion. Had it happened in the night time, it might have ended in an extensive conflagration, and its origin would never have been known. Many destructive fires may have started in this manner, their causes remaining forever unknown. It is an incident worth hearing in mind, and proves that too much care can not be taken in guarding against fire.

LADIES AS INSURANCE AGENTS.—A project is on foot among numerous New York ladies for forming an insurance company, having only women for officers, agents and policy holders.

SCRAP IRON.—Manufacturers should look well to their scrap iron; do not waste a piece, no matter how small; gather all together—assort, have different receptacles for steel wrought, cast, and malleable iron. The wrought iron from the carriage shop is the most valuable of scrap iron, but to bring the highest price there must be no malleable or cast iron mixed with it; every pound of scrap has a market value, and it should be placed in barrels or boxes and sent to market. If there be any considerable quantity, it will pay to send it to the mills and have it worked up into bars. It is the small manufacturers who do not take care of their scrap, but allow year after year to pass without paying any attention to it, and scraps of iron can be found all over their factories, while boxes and out-of-the-way corners are filled with it, and hundreds of dollars worth of what would make the best of bar iron is allowed to go to waste.—*Scientific American.*

SILK MANUFACTURE.—Ten years ago, silk manufacturing, in the Atlantic States, was in its infancy, and partly an experiment; now it has attained vast proportions, employing a capital of not less than thirty millions of dollars, and giving employment to over sixteen thousand operatives. The value of its products is about forty millions annually. Californians should bear this fact in mind, and reflect that we may here produce the raw materials, for all this immense business, besides manufacturing many millions in value of goods which we now pay for in Europe with the products of our mines of gold and silver, and our broad acres of wheat.

GOOD HEALTH.

Airing Bed-Roms.

The most desolate-looking, sick-smelling, and every way repulsive room in most houses in cold weather, is the cold, unventilated bedroom. The prevalent notion is, that if it is cold, it does not need ventilation; and the next thing is to cork up the windows, so that they do not get opened by any chance. That is all wrong.

Other things being equal, cold air is more invigorating than warm air because more condensed, and therefore cold air in the bedroom is to be preferred during the night. It is also true that cold air may be impure; and rooms need ventilating even in winter. If a room is warm, the air, being colder than in warmer weather, rushes in more eagerly, and we feel it more keenly, and that misleads us to think that we need not take pains to ventilate bedrooms in cold weather. All this being true, a fire in a room helps ventilation, especially an open fire, and it is well to have fire enough to take the chill off the air and the bedding every evening. It may even be kept going all night provided you have a window or ventilator open. If you have not been accustomed to sleep with the window open, begin with a very small opening, and then gradually increase it, but do not let the wind blow directly upon you. If you feel it and cannot avoid it, turn your face to it. In the morning, just as you are vacating the room, throw it open, and all the merrit if there has been no fire in it.

As for the bedding, hang that out of the window. It will air three times as fast as it can in the room. Try it, and then smell of it, if you would know the difference. Let your bed and room air thus an hour or two, according to wind and weather—and in the summer months longer. Do not fear that this will make you appear untidy. The best housekeeper is the one who knows how best to make the house and its work serve the health and the comfort, as well as the taste of its inmates, not the one who makes up her bed as soon as she is out of it, covering up all the foul exhalations of the night previous, and then sleeping in them the next night. Some of the chamber work cannot well be done too early, but the beds may be left until ten o'clock. Then protect yourself with head and shoulders and gloves, and make them up and tidy the room, but do not allow yourself to become chilled. The latter result will not happen so readily as you might expect. With a room well ventilated and sunned, you can work comfortably with the thermometer eight or ten degrees lower than in a room where these two items are lacking. This is the direct advantage of fresh air and sunshine. The indirect, but still greater economy, is found in the fine spirits and the elastic vigor that increase your ability to wash, and in diminishing the doctor's bills.—*Science of Health*

PREVENTING SMALL-POX.—The *Atlantic Medical and Surgical Journal* publishes the following: Dr. G. D. Norris, at a recent meeting of the Alabama State Medical Association stated that during the prevalence of small-pox in Huntsville certain families at the instance of some one unknown, had resorted to the free use of the tea of the *Cimicifuga racemosa*, or black snake root of the United States Pharmacopoeia (black cohosh) as a preventive of small-pox. In the families using the *cimicifuga* there occurred no case of small-pox; though some were exposed to the disease. In the same families, Dr. Norris vaccinated the members but without effect so long as they continued the use of the cohosh; after ceasing to use the tea as a prophylactic, he again vaccinated them, when the specific effects of the vaccine virus were produced. He submitted the results in these cases as new, and not without interest to the profession.

Broadcloth and Exercise.

Professor Hamilton, in an able address on hygiene to the graduates of the Buffalo Medical College, denounces broadcloth as an enemy to exercise, and therefore to health. He says:

"American gentlemen have adopted, as a national costume, broadcloth—a thin, tight-fitting black suit of broadcloth. To foreigners we seem always to be in mourning; we travel in black. The priest, the lawyer, the doctor, the literary man, the mechanic, and even the day-laborer, choose always the same black broadcloth—a style that never ought to have been adopted out of the drawing-room or the pulpit, because it is a feeble and expensive fabric, because it is at the north no protection against the cold, nor is it any more suitable at the south. It is too thin to be warm in winter, and too black to be cold in summer; but especially do we object to it because the wearer is always soiling it by exposure. Young gentlemen will not play ball, pitch quoits, or wrestle, or tumble or any other similar thing, lest their broadcloth should be offended. They will not go into the storm, because their broadcloth will lose its luster if rain falls upon it; they will not run, because they have no confidence in the strength of their broadcloth; they dare not mount a horse or leap a fence, because broadcloth as everybody knows, is so faithless. So these young men and these older men, these merchants, mechanics and all, learn to walk, talk and think soberly and carefully; they seldom venture to laugh to the full extent of their sides."

PERFUME AND HEALTH.—An Italian Professor has made some very agreeable medical researches, resulting in the discovery that vegetable perfumes exercise a positively healthful influence on the atmosphere, converting its oxygen into ozone, and thus increasing its oxidizing influence. The essences found to develop the largest quantity of ozone are those of cherry, laurel, cloves, lavender, mint, juniper, lemons, fennel, bergamot; those that give it in smaller quantity are anise, nutmeg and thyma. The flowers of the narcissus, hyacinth, nignonetta, heliotrope and lily of the valley, develop ozone in closed vessels. Flowers destitute of perfume do not develop it, and those which have but slight perfume develop it only in small quantities. Reasoning from these facts the professor recommends the cultivation of flowers in marshy districts, and in places infested with animal emanations, on account of the powerful oxygen influence of ozone. The inhabitants of such regions should surround their dwellings with beds of the most odoriferous flowers.

SINGULAR DISEASE.—The papers have discovered a curious disease out in Cache county, Utah. They say that the patient is attacked with a pain in the left knee, the leg below the knee, down to the toes, becomes much swollen, hardened and red. The pain then abates. Then the swelling recommences above the knee and extends up to the body, when inflammation seizes the bowels and the patient dies. A medical man out there, who says he has had forty years practice, says he has never known anything like it before.

ENTERTAINING COMPANY.—"Do you ever thoroughly enjoy receiving company?" said a lady to us not long ago. For my part, I am so occupied with the fear that my guests will not be sufficiently entertained that I have no time to enjoy them." Most American housekeepers will confess something of this feeling. Even in our best appointed households there is not that absence of care in the department of the lady of the house which is seen in French or English drawing-rooms. Her thoughts cannot help wandering to the kitchen, even in the midst of the most animated conversation. She knows full well that all these endeavors which have made her somewhat too weary to be quite at her best in looks or manner, there may be a failure in serving the repast. It is curious to see what a different woman she is after supper, if all has gone well. For the time she is safe, and exuberant with a sense of relief.

FORCE OF GUNPOWDER.—A most remarkable instance of the force of gunpowder was observed in the blowing-up of a Confederate iron-clad, at the time of the evacuation of Charleston by the Southern troops, in 1865. It was considered very remarkable that search, in the immediate vicinity, some months afterwards, failed to discover anything more than small pieces of the wreck. It was only a few months since, in fact, that any considerable portion was discovered. At the time referred to, a ripple was observed at an unusually low stage of water and in a most unexpected locality. Search for the cause revealed the bow and one entire broad-side of the iron-clad, forming a mass of iron weighing about 100 tons; which must have been thrown, by the force of the powder, more than a quarter of a mile! The finding of the balance of the hull has not even yet been reported.

SELLING ILLUMINATING OILS BY WEIGHT.—The better quality of illuminating oils are the heavier, and if retailers were compelled to sell by weight, as the refiners are, the small purchaser would have in the weight and color of his oil a ready and correct test of its value as an illuminator.

MISCELLANEOUS.

The "Why" in Vegetable Cookery.

Why should soda be boiled with greens, cab-bages, Brocoli and turnip-tops? Because the oil which all these vegetables contain more or less, the soda extracts, and leaves the greens sweet and wholesome; but the water is, after boiling the greens with soda, most unwholesome, perhaps poisonous. A piece of soda, filbert size, is sufficient for a large saucepan of boiling water. Turnip greens have scarcely any oil in them, but are nevertheless much more wholesome for eating when cooked with a little soda.

Why should vegetables be washed in rather warm water first, then in cold, to cleanse them from sand and insects? The hot water, which must be better than tepid, cause the insects and sand to fall out at once. Insects do not always dislike cold water and salt, but the hot water kills them. It must be understood that only a small handful of greens or one head of cabbage at a time must be washed, and then instantly thrown into the cold water, which crisps and thoroughly cleanses them. Spinach, leeks, celery and sealake, are thus rendered very clean, and, moreover, are very rapidly cleansed. It is worse than useless to attempt to cleanse vegetables in salt and water. The hardness which salt creates in the water prevents all cleansing properties. The salt may kill the insects (it does not always do this), but they stick on hard and fast; the hot water makes them fall out at once, and the cold water crisps and also blanches them.

Why should turnips be cut across the fibre in rings of less than half an inch in thickness? For three reasons: first the turnip need only be peeled very thin, instead of in the usual manner, thickly and wastefully; secondly, by so cutting them the fibres are cut across, so that however old the turnip is, it is never stringy; thirdly, they require only fourteen minutes to boil in plenty of boiling water and salt, and thus the delicate flavor of the turnip is preserved, also they can be more easily mashed. The thinner the circles of turnip are cut, the quicker they cook and the less fibre they will have.

SALT ON CARPETS—PROTEST.—A Minnesota lady writes to her local journal, as follows: As you insert a paragraph recommending sprinkling salt on the carpets before sweeping to prevent dust rising, please insert my protest, lest some thoughtless housekeeper injure both her carpet and her health. As the salt cannot all be swept off, that remaining will collect moisture, keep the carpet damp, and the feet treading it, damp and cold. As tea-grounds cannot always be obtained, I recommend cotton or woolen rugs, cut by the children or house-maid at their leisure, into bits the size of the finger-nail, and put it into a thin bag—the little bags that table salt is put up in. Before sweeping, plunge the bag and its contents into water, (warm is best, it wets more thoroughly) wring out and use as tea-leaves. If desired, the bag can be taken up and washed either in an open tub, collander, or even in the bag, and used again and again.

BEST METHOD FOR KEEPING BEEF.—"Cut up the meat in pieces as large as you desire. Pack it in a barrel, or cask. Then make a brine as follows: one and one-half pounds salt to one gallon water, one ounce saltpetre to 100 pounds of beef, one tablespoonful of ground pepper to 100 pounds of beef. Put in the salt and saltpetre and heat it boiling hot, skim it, then add the pepper. Pour it on the beef boiling hot and cover closely. Your meat will be good and fresh any time. The philosophy is this: the hot brine closes the pores on the surface, preventing decay and meat from getting too salt. Try it. If necessary scald the brine over in the spring, or put on a new brine. Farmers can in this way have fresh meat nearly all the time. The meat should be taken as soon as it is cold, before it has acquired any old taste by exposure to the atmosphere.

AN ECONOMICAL DISH.—Steam or broil some small potatoes; mash them with some butter or cream, season them, and place a layer at the bottom of a pie dish; upon this place a layer of finely chopped cold meat or fish of any kind, well seasoned; then add another layer of potatoes, and continue alternating these with those until the dish is filled. Smooth down the top, strew bread crumbs upon it, and bake until well-browned. A small quantity of meat serves in this manner to make a nice presentable little dish.

NEW WAY TO COOK EGGS.—We see in a western exchange a hint in regard to cooking eggs, which we think well worthy of being more extensively known. The difficulty is, that eggs cooked sufficiently to fix the yolk, are, so far as the white is concerned, almost indigestible. To better this, do not boil your eggs over the fire at all, but put them into water near the boiling point and let them stay there ten or fifteen minutes, adding hot water enough to keep the temperature uniform. Do this, and both white and yolk will be digestible.

CUSTARD SQUASH is a very profitable and valuable variety. It grows to a large size, has a very hard shell and is a great keeper. It has a high reputation in market.



W. B. EWER.....SENIOR EDITOR

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San Francisco:

Saturday Morning, April 26, 1873.

Legal Tender Rates.—S. F., Thurs., April 24—
buying 86; selling 87.

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The Epizooty and Its Remedies.

The epizooty is upon us. As a sanitary
measure, rigid cleanliness and a full and per-
fect ventilation in any place where horses are
kept in buildings or stables, but never exposing
them to drafts of cold air.

Feed warm bran mash twice a day and take
the liquor of boiled flaxseed to mix the mash
with.

A little pure whisky daily, say half a pint, to
stimulate. Liniment for external application
on throat, composed of hartshorn and sweet
oil.

Sponge the nostrils with a solution of salt
and hot vinegar; also wash the mouth with a
weak solution of the same. Wet the hay
slightly with vinegar. Blanket thoroughly, and
give a little exercise daily.

In Pennsylvania, horses kept warm and
clean, not worked or exposed, with light feed,
such as bran and boiled oats, with little hay,
were successfully treated without medicines.

In Tennessee, a warm dry bed, mild food,
avoiding exposure to wind and rain, constituted
the remedy.

In New Jersey, those did best who kept their
horses in stables, without giving any medicines
or resorted to any other treatment than a due
regard to cleanliness.

CHINESE MINERS.—We stated recently that
the California Reed or Quicksilver mines, in
Napa county, had discharged its white miners
and employed Chinese in their stead. One of
the discharged miners has since informed us
that the mine is in Yolo county, not Napa, and
that some seventy-five Chinese have been em-
ployed. He says that it took six Chinamen
two and a-half days to put in two sets of tim-
bers, which two white men on one shift ought
to do in a day. The tunnel is six feet high
and five feet wide at bottom, and the timbers
are six by eight.

THE NEW DOLLAR.—A dispatch from Wash-
ington states that the Mint has fixed the charge
for coining the new trade dollar at one-half
cent a piece, the lowest possible rate under the
law. Great expectations are entertained of the
trade dollar, as a means of creating a home de-
mand for parting bullion, and keeping gold in
the country.

The Stevens Furnace.

The Use of Coal or Wood, Instead of Coal Tar.

One of the most interesting topics of the day
to the mining community, is the working of the
newly-invented Oxy-hydrogen Furnace, com-
monly called Stevens' Furnace. In our issue
of December 7th, 1872, we gave an illustration
and a detailed description of the construction
and operation of this furnace, and those of our
readers who feel interested in the matter can
send for that number of the Press. The experi-
mental furnace which has been erected in this
city differs, however, in some important par-
ticulars from the one shown in the cut referred
to. The principle of economizing fuel is the
same, the only difference being the application
of the best and construction of the furnace.
It has been running for some little time with
coal-tar as fuel, but has recently been fitted up
so as to consume coal instead.

We saw it in operation one day this week at
the corner of Main and Harrison Streets in this
city, where a number of mining men were as-
sembled to see it run. The front end of the
furnace has been made higher than it was when
coal tar was used, in order to afford a chamber
to burn the coal. The coal is fed into this
chamber from the side and a pipe from the
front of the furnace leads the smoke and pro-
ducts of combustion into the furnace proper.
The apparatus for the introduction of super-
heated steam is the same as usual except that
the orifice by which it and the gases produced
from the combustion of the coal, are intro-
duced into the furnace is somewhat larger.
The ore is fed into the hole in the stack about
half way up, food falls on an inclined plane,
where as it is gradually melted by the flame, it
runs slowly down into the body of the furnace.
The chamber now used to burn the coal needs
only to be enlarged in order to use wood. No
smoke, gas or heat passes out of this chamber
except through the pipe that leads it into the
furnace and just as the gases, etc. enter they are
forced in by the jet of the superheated steam.
The heat thus generated by the gas produced
by the union of the superheated steam with
the gas produced by the combustion of the coal
is very intense. The patentee claims that the
superheated steam coming in contact with the
carbon vapor under pressure combine with it,
and forms the highly combustible gas which
produces the requisite heat.

It is claimed that a most intense heat is ob-
tained by this arrangement, and it would ap-
pear that the only question to be determined
is that of economy and applicability to smelt-
ing ores. When these questions are solved
practically and it is proven a success, its general
introduction is only a matter of time.

A furnace to be run by this process has
been erected at Eureka Nevada and was to
have started up on Thursday last. It is
of the capacity of 50 tons in 24
hours and is 100 feet long. This length
probably includes the long incline upon which
the ore slides to the furnace. Dr. McKinney
who has put up the furnace at Eureka, adver-
tises to smelt ore at \$15 per ton, a reduction of
about 50 per cent. on former rates. The price
of smelting at Eureka is from \$25 to \$30 per
ton for free carbonate ores, and for other
classes of ore from \$30 to \$35 per ton, with a
guarantee of 75 per cent. on ores that run
over \$100 per ton.

These figures will show the confidence with
which the parties owning the furnace, take
hold of it. We hope that a correct and accu-
rate record will be kept of the operations of
the furnace, such as cost of steam and fuel,
time consumed in smelting certain classes of
ore, degrees of heat etc., etc.; the subject is of
much interest to the mining community, and
if these furnace men can prove an actual sav-
ing of even ten per cent. a revolution in our
method of working ore will be made. This offer
at the first furnace of any size erected on
this coast, to reduce ore at 50 per cent. less
than customary in a particular district is a sur-
prising one, and may well set our mining com-
munity thinking of the sums they have paid
out for smelting ores and the benefit a new sys-
tem will be to them. The furnace can burn
petroleum, coal-tar, coal or wood equally well.
The one at Eureka will use wood.

THE CHICAGO SILVER MINING COMPANY is the
name of a new organization incorporated in
London last month. The company propose to
acquire and work the property so called in
Dry Cañon, Utah, with a capital of £150,000
in shares of £10 each. The purchase money
is £110,000—£10,000 in cash and £100,000 in
fully paid shares.

Corporations Under the New California Code.

[Written at the request of the publishers, by J. M.
HAVEN, Esq., of S. F.]

We call the attention of the readers of this
journal to the provisions of the Code relating
to the formation of Corporations. There are
few subjects of more interest to business men
than that of Corporations. Scarcely a day
passes that some new corporation is not formed
for the prosecution of manufacturing, mining,
or trading. The tendency of the times is to an
increase in the number of, and in extension of
the objects to be secured by corporations; and
it is almost a necessity for every business man
to acquaint himself with the laws controlling
the birth and life of these artificial members of
society.

The object of the Code is to provide for the
formation of corporations for every conceivable
business, and also to more clearly define their
procedure, powers, rights and responsibilities.
Section 286 enumerates twenty-seven different
specific objects and classes of objects for which
corporations may be organized. One of these
subdivisions—No. 13—is sufficiently compre-
hensive to embrace any business not specifi-
cally provided for in some other subdivision.
It provides for: "Manufacturing, mining,
mercantile, mechanical, wharfing, docking, or
chemical purposes, or for engaging in any
other species of trade, business or commerce."
Under the former law a corporation was formed
by the signing and acknowledgment of a
"Certificate of Incorporation," by at least a
certain number of persons which varied ac-
cording to the purpose designated, from three
to twenty, and the filing of this certificate with
the clerk of the county in which was located
the principal place of business of the corpora-
tion, and a certified copy with the Secretary of
State.

Under the Code, "Articles of Incorporation"
must be prepared, setting forth: The name of
the corporation; the purposes for which it is
formed; the place where its principal business
is to be transacted; the term for which it is to
exist, not exceeding fifty years; the number of
its Directors or Trustees, and the names and
residences of those who are appointed for the
first year; the amount of capital stock and the
number of shares into which it is divided; the
amount actually subscribed, and by whom.
The articles must be subscribed by five or more
persons, three of whom must be citizens of this
State, and must be acknowledged by the sub-
scribers before some officer authorized to take
and certify acknowledgments of grants of real
property.

Upon the filing of the articles of incorpora-
tion in the office of the County Clerk of the
county in which the business of the company
is to be transacted, and a copy thereof with
the Secretary of State, the Secretary of State
must issue to the corporation over the great
seal of the State, a certificate that such articles,
containing the required statement of facts,
have been filed in his office; and thereafter the
persons signing the same, and their associates
and assigns, are a body politic and corporate,
by the name stated in the certificate, and for
the term of fifty years, unless it is in the ar-
ticles of incorporation otherwise stated.

Every corporation must hold a meeting
within one month after the articles of incorpo-
ration are filed, at which shall be adopted a
code of by-laws for its government, which
shall not be inconsistent with the Constitution
and laws of this State. The by-laws when
adopted, must be certified by the officers of the
corporation, and filed and recorded in the Re-
corder's office of the county where the princi-
pal place of business of the corporation is lo-
cated. Amendments to the by-laws can only
be adopted by a two-thirds vote of the stock-
holders; and the amendments must be certified
and recorded in the same manner as the origi-
nal by-laws.

THE KEYSTONE AND AMADOR CASE.—A dis-
patch from Washington to the Call states that
the decision of the Secretary of the Interior
in the case of the Keystone mine and Amador
town site case referred to at length in our last
issue, has been deferred by the application of
the Rose party for a further hearing, but it is
expected next week. In the mean time, As-
sistant-Attorney-General Smith has given the
Secretary an official opinion strongly adverse
to the Rose claim and sustaining the decision
of Commissioner Drummond, in favor of the
Keystone Company and the Amador town
site. Senator Sargent has written and filed
with Secretary Delano a letter strongly oppos-
ing the effort of Rose and others to gain posses-
sion of these properties, by reason of the pre-
tended passage of a title to the lands, or in
which they are situated as school lands as be-
fore mentioned. Mr. Sargent has argued the
legal points of the case fully, and points out
the danger to the mining interests of the
country, which the efforts to establish the prin-
ciple involved will occur.

A GOLD NOTE BANK will shortly be es-
tablished at Santa Barbara with a capital of
\$100,000.

The Steetken River Mines.

A party of some 15 miners left this city this
week for the Steetken River, in British Colum-
bia. "Another party will leave here on the
next steamer among whom will be Mr. Peter
Osergovitch, who was in that section of country
some years since and gives evidence of its exceed-
ing richness. The majority of the men will
engage in placer mining on the river but Mr.
Cargovitch is after silver and will prospect
further up the river than he has been before.
He exhibits some specimens of silver which
were found in a bar in the river and states that
the Indians had ornaments and tools of the
same material. The party that left this week
intend remaining at Victoria until the others
arrive on the next steamer when they will all
proceed together. They are very sanguine in
their expectations both as to getting "49
placers" and "Washoe silver diggings." Pro-
visions for a year have been obtained and all
the appliances necessary for a long stay in an
isolated country. A number of men died of
scurvy at the time of the last expedition, which
caused it to be abandoned so those who now
return thither intend going well prepared for
such an emergency.

While the bars on the river are said to be
rich in the yellow dust large hanks partaking of
the character of our California hydraulic dig-
gings are also reported to exist in various lo-
calities. If this be the case a new field for our
enterprising prospectors is opened and one
which many will like to try, although quartz
excitements lure many on to toil and hardship,
the idea that rich placer diggings, lying idle
and waiting only to be located and worked, will
make most any miner "take up stakes" and
seek the New El Dorado. The fact that the
locality in which these mines are situated is
an inhospitable and distant one, where in-
clement weather and hard fare is the rule and
the season is short, will only be an additional
argument for many to go. Without doubting
the statements made by the parties who have
visited the mining region of the Steetken River,
or evincing any desire to throw cold water on
their project, we would nevertheless caution
those who have steady employment that it is
much better to let these men depart and bring
us back practical proof of their assertions in
the shape of gold dust or rich ore, than take the
chances of a than trip to an unknown region.

The men who are going on the expedition are
most of them experienced prospectors and
miners, all hard working men, and just the
right sort to test the country. If they find what
they seek, their friends will soon hear of their
success, and if they do not they will return
here and make the fact public. In case rich
diggings and rich quartz mines are found, there
is plenty of time to go there, for 25 men can't
take up all there is in the country, and it will
be recollected that in quartz camps particularly
the richest mines are not always the first ones
located. We expect to hear from some mem-
bers of the expedition as soon as practicable
after their arrival at the scene of operations,
and will then lay the information before our
readers. We heartily wish success to the mem-
bers of the expedition, and hope that all of their
anticipations will be realized.

TEXAS PACIFIC RAILROAD.—After long and
patient waiting the citizens of San Diego, on
the 21st inst., had the pleasure of assisting at
the ceremony of breaking ground on the Texas
Pacific Railroad. Mr. Harris, one of the Di-
rectors of the road who assisted at the cere-
monies of breaking ground, declares that the road
will be pushed through vigorously, and will
probably be completed in time to carry pas-
sengers to the centennial celebration in 1876.
The company is required to finish ten miles of
road from the western terminus within one
year from the first of May next. This western
section will be constructed by the California
Texas Railway Construction Company, of
which General Brieton is President. The force
of men now at work is small, but if the com-
pany performs its promise it will probably be
greatly increased. The benefits which this
road will confer upon San Diego will be large,
and will make it a prominent town of our
Southern Coast. The inhabitants are, how-
ever, just at present, in all the excitement inci-
dent to a quiet place when railroad construc-
tion is first begun, and they have already—on
paper—placed their city as the Queen of the
Pacific. They are talking about taking the
China line away from San Francisco, and mak-
ing San Diego its point of departure. These
speculations are rather amusing, and show the
tendency of mankind to exaggerate the possi-
ble benefits of railroads. There has, however,
been so much "railroad talk" at San Diego for
the past few years, that it must be refreshing
to the people to have something tangible in
sight in relation to it.

The Vienna Exposition.

The Vienna Exposition now about being inaugurated, promises to be not only a grand success but will differ in many important particulars from any of the great national exhibitions which have preceded it.

1st. One of its characteristic features will be its direct connection by branch roads brought to the very door of the building, with the entire railway system of Europe. The main track where it enters the grounds, spread out into eleven branches or sidings running to every part of all the various exhibition buildings, so that merchandise can be carried directly to the very door where it is wanted, all along the lines of the buildings, which, if projected in a straight line and counting both sides, would measure about three miles.

2d. The machine department with its clatter and noise; its smoke, steam and hot oil, will be placed in an entirely distinct building separate from the general exhibition; an arrangement which will add greatly to the convenience and comfort of visitors.

3d. The fine art department, always heretofore associated and sometimes indeed, even mixed up with the general exhibition, will be entirely by itself, where it can be scanned and studied, in quiet and without the disturbing surrounding noise and stir of the general exhibition.

4th. More pains will be taken to isolate different nationalities in the general exhibition room, so that visitors may know at all times just where they are, and readily find their way from the allotment of one country to another.

5th. The system of lighting from the roof, always involving loss and damage from rain, will be obviated. We have been furnished with some notes by our correspondent, from which we are enabled to give the following facts:

The buildings consist of four main groups, a ground plan of the principal one—the general exhibition building—is given herewith, having been engraved from a drawing forwarded to us by our special correspondent, Mr. G. Kustel. The shading is so made as to show the relative amount of space and the position thereof assigned to each nationality.

Directly beyond this (north) is, first the Agricultural Hall or Halls, Covering, in all, about one-third as much ground as the main building, and running parallel to its whole length. Still beyond this are the machinery halls, occupying about the same space as the agricultural buildings, and running parallel therewith.

Just to the right of our diagram, or beyond the eastern entrance of the main building, is the Gallery of Fine Arts, separated therefrom by an open area, embellished with flowers and fountains, but connected by galleries, reaching out from both the north and southeast corners. The admirers of Art may here study and contemplate the works of the "masters" apart from the din of the general exhibition. The building is a handsome structure of brick, cased with cement and richly adorned.

Each of these buildings are separate and distinct—the one from the other. This novel plan of the general arrangement of the exhibition will, it is confidently expected, form a most pleasing and commendable improvement over previous exhibitions.

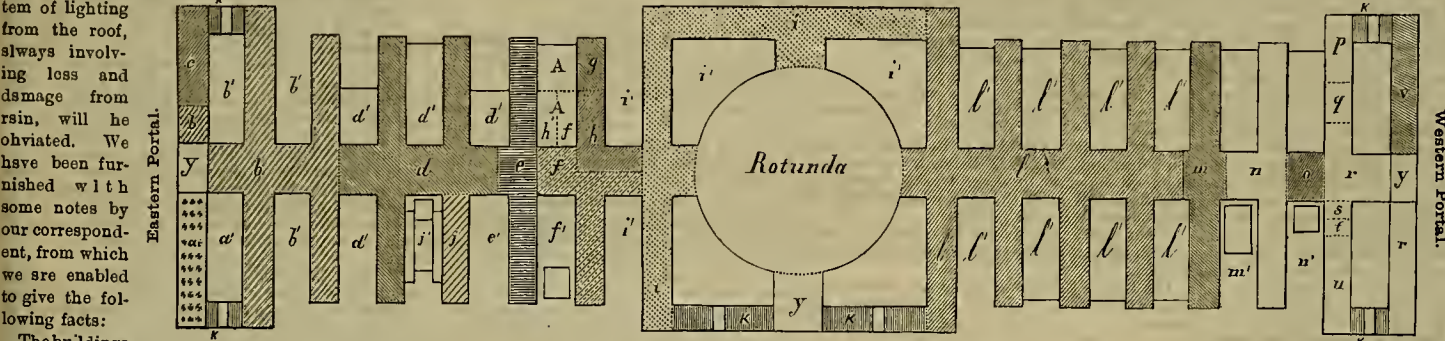
Plan of the Main Building.

The first of this group of buildings, the ground plan of which is given herewith, consists of a nave or central hall, running from the Eastern to the Western portal, a distance of 2,953 feet or more than half a mile long, by 83 feet in width and 74 feet high. The nave, where it meets the grand rotunda,—the dome of which is 348 feet span—branches off either way, forming a quadrangle 676 feet square, surrounding the rotunda, and opening

into it at four opposite points. Colossal triumphal arches ornament the approaches to the rotunda at its entrances from the northern and southern sides, or from front and rear; while right and left, as far as to the nearest of the small transepts, stretch handsome colonnades, which form a very fine facade to and along the central portion of the main quadrangular portion of the principal building. The nave, it will be observed, is intersected by 16 transepts, each 572 feet in length by 51 in width and 41 feet high. The two transepts at either end are bound together by buildings thrown across from one to the other and occupied as offices. These connecting buildings add about 100 feet to the length of each of the four outer transepts giving them the same length with the sides of the central quadrangle.

The spaces between the five center transepts, on either side of the quadrangle were originally left open, and intended for ornamental grounds; but such of the nationalities as were allowed space in the transepts and adjacent portion of the nave, who found their room deficient have been allowed to enclose and roof over such extra room as they might need in the open spaces. The spaces thus enclosed, up to the date of the letter of our correspondent, Mr. Guido Kustel, are shown on the diagram.

The Allotment of Space. The allotment of space to the different nations—its relative proportion and order of arrangement—is shown in the diagram by the different character of shadings and by references. The different nationalities have also been assigned space in the agricultural and mechanical



Front Portal. DIVISION OF SPACE AT THE VIENNA EXPOSITION.

halls, as nearly as possible opposite and corresponding to the space assigned in the main exhibition building. The central circular area is devoted to a general exposition.

It will be remembered, that at the Paris Exposition of 1867, nearly half the space was reserved for French contributors, while at present less than one-quarter of the gallery and yard space is claimed by Austria, although Austro-Hungarian applications at present exceed that of the French of 1867. Not counting the rotunda, the exhibition area of the galleries counts about 640,200 square feet, and is divided in the following proportion:

Austria.....	158,314 sq. ft.	Egypt & Mid-Germany.....	10,708 sq. ft.
France.....	72,904 "	Holland.....	9,396 "
England.....	57,146 "	Greece.....	9,258 "
Russia.....	35,402 "	Sweden & Norway.....	9,226 "
Italy.....	32,000 "	Roumania.....	9,162 "
Hungary.....	31,700 "	Spain.....	6,464 "
Turkey.....	31,348 "	Portugal.....	5,536 "
Belgium.....	27,882 "	Persia & Mid-China & Japan.....	3,626 "
United States.....	14,400 "	Tunis.....	2,773 "
Switzerland.....	12,000 "	Morocco.....	928 "
8th America.....	11,626 "		

Since the above table was prepared the State Department has received information that 6,000 additional square feet of space has been allotted to the American Department. Articles from the United States, intended for exhibition will be received until June 10.

General Reference.

The quadrangular portion of the main building 676 feet square, together with the cruciform portion of the nave and grand transept, its lofty and colossal dome, its grand colonnade, etc., has been designed as a permanent structure, and national palace of industry, after the balance of the main and the centre of the associated buildings are removed.

Unexpended Demand for Space.

The demand for space has been altogether beyond what was anticipated, and to accommodate, in addition to the taking in of the open areas alluded to, most of the offices and all the restaurants were removed to special buildings which have been erected here and there about

the ornamental grounds surrounding the building.

The Emperor has had a pavilion constructed on the outside grounds, which will form one of the great sights; for all the principle decorators and upholsters have fitted it up in the most costly and elaborate style, as an exhibition of their various trades.

The Viceroy of Egypt and the Sultan of Turkey have also each erected pavilions or palaces, as representative and emblematic of the peculiar forms of architecture, adornment and furnishing of their respective nationalities.

Our correspondent writes under date of March 20th, as follows:—"The United States machinery department will be well represented by new and interesting machines, several large steam engines, fire engines, sewing machines, stereotype and printing machines, and those for tools, horse shoes, for shoes, threshing etc. Mining and metallurgy, (in which California might have won much reputation, if something in that line had been done as urged in the SCIENTIFIC PRESS of June 15th 1872) will be represented principally by the American iron industry, exhibiting also Bessemer and Silico steel machines; of minerals, a collection from Nevada and one from Utah will be shown; of Agricultural products—wines from California and some of the Eastern states, tobacco, flour, sugar etc, is under way. An American school house fitted out with a collection of American school books and other means connected with our systems of education will be erected and exhibited by Mr. H. Heiger. There is also a considerable contribution to

The Woman's Co-operative Union.

The Woman's Co-operative Union, an association organized some five years since for the purpose of furnishing sewing to poor women, has failed to carry out the plans for which it was started. It was intended to give sewing women employment at remunerative wages or enabling them to obtain a controlling interest in the business, and thus afford them all the profits made on their work by dealing directly with the consumer. The report of the trustees states that the causes of failure are that in cheap needle-work they could not compete with Chinese labor nor with imported work. Moreover, the ladies, after the novelty of the thing wore off, took their sewing wherever it was most convenient instead of supporting the institution.

Although there was a loss of \$637 during the five years, the sum of \$46,000 has been distributed among a class much in need of it, so the Union has not been without good effects. The stockholders wish now to devise if possible, some better method by which the seamstresses of this city can be protected and their interests advanced. This class of people are, on the whole, much better off in this community than elsewhere. Although their pay is no better in proportion to the price of living than it is in the Eastern States, they are in a milder climate where the severity of winter is not felt to such an extent and where the hardships incident thereto are unknown. Nevertheless, these seamstresses are as numerous here as in other cities of like population, and distress is sometimes felt amongst them, so it is much to

be deplored that the efforts of the Woman's Co-operative Union have been futile in the attempt to ameliorate the condition of those whose only reason for not working was, want of opportunity. It seems strange, but is none the less human nature, that ladies in circumstances to be able to pay for their

sewing should give so little attention to the possible necessities of the needy of their own sex, as to let an institution of this character become a failure for want of patronage. They only wanted work to do and fair remuneration for their services—not charity. It is to be hoped that the philanthropic wishes of the members of the society will be carried out in this direction and that some plan may be devised by which the needy sewing women of our city may be relieved.

THE GOLD QUARTZ DISCOVERIES.—The reports from the gold quartz discoveries in north-eastern Nye county continue very flattering. We have been shown specimens from the ledges spangled all over with gold. They are owned by practical miners, of limited means, the deepest shaft only being 70 or 75 feet deep. Our advice to the owners is to keep on developing until they get their mines thoroughly opened before inviting capitalists; a failure at the outset in working such property usually damns it for years in the public estimation, and sometimes beyond the hope of restoring confidence. Have a dump-pile ready for the first run, boys. If you have a good thing—and we think you have—don't make a failure in your first attempt to prove the fact to the world.—Pioche Record.

BRISTOL DISTRICT.—Ten tons of hullion were shipped from Bristol District on the 21st, the freight being \$50 per ton. The mines are turning out well, and it is stated that the district bids fair to rival Eureka as a hullion producing section. The smelting works are turning out about \$4,000 a day.

RICH.—The Queen of the West mine, in the Camp Floyd District, is yielding ore assaying from \$100 to \$16,000 to the ton. This mine was sold last Fall for \$175,000. It stocked at \$500,000. It bids fair to rival the Emma.

THE EMMA mine shipped one hundred and seventy-five tons of ore the past week.

Coal in Southern Italy.

A Naples correspondent of the London *Mining World* writing under the date of 4th March, says,—"At a time when the question of coal supply is so much agitated the following reports, just published by one of the Naples journals will have an unusual interest:—"A correspondent from Villa San Giovanni, Calabria, says that as a land surveyor was forming the plan of a property near San Agata he came on some fragments of lignite. On asking the peasantry if they had ever found coal of that kind they replied that they had long used it for cooking, and in many places had found large pieces of real coal (*proprio dei pezzi carbone*), which they imagined had been purposely concealed under the ground, who knows for what object? These facts having been communicated to the Sub-Economato of San Giovanni, he interrogated a blacksmith, and ascertained that he had been in the habit of using this combustible in his forge. The *Economato* then visited the spot indicated, accompanied by an English railway engineer who happened to be at Melito, by the *Snydie*, and some peasants carrying picks and spades. On arriving at the summit of a mountain they found a black sparkling mass, which was recognized as coal. After considerable labor a quarter of a quintal was collected and carried off to the establishment of Signor Hallam, an Englishman, which is in our Commune. On being tested it was found that intermixed with lignite there was a large quantity of coal, in no respects differing from that which the same establishment imports from England. On the opposite side of the mountain there appears, almost laid open as it were, a large sparkling vein, and on the north as well, extending through the whole length of the mountain, vertical strata of this coal. I have thought it better to send you the report of the correspondent in his own words, and you will take it for what it is worth; but you will not fail to perceive that the names of localities and persons, two being Englishmen, are given. It is well known that Calabria possesses great mineral wealth, though there is much difficulty in working it—often followed by great disappointment. Four or five years only have elapsed since a Neapolitan, since deceased, made great efforts to induce the proprietors of land to discover coal. An establishment was opened in the *Largo du Municipio*, where I have seen numerous specimens of lignite and of something very like coal, but, in spite of the sanguine belief of the speculator, it may be doubted whether the real article was found. How, then, is the present discovery to be explained? From want of roads and from brigandage, and the absence of a spirit of enterprise, Calabria has been almost closed to the world, and it is possible, therefore, that wealth may be discovered there which has not been dreamt of. As regards the 'fiad' which I now announce much more information is desirable, but it is worthy of attention."

LOCOMOTIVE CONSTRUCTION.—The Sacramento *Record* of the 15th says: The new enterprise of "constructing locomotives at the railroad shops in this city is no longer a doubtful one. The original order was to build ten freight locomotives. Lately this order was amended by adding, "and two passenger locomotives." Thus twelve in all are to be built. Two-thirds of the iron work for these is already completed. The passenger engines will have 18-inch cylinders, the others being 17-inch. All the wrought iron is being made out of scrap iron, and in this respect, as in others, the locomotives will be superior to any made by Eastern manufacturers. The whole work is being done better than is usual in shops where locomotives are made for sale. Norway iron is used largely, which is an item of superiority. More general care is taken than is usual. Exceeding strength and durability are the essentials aimed at. The heaviest of these iron horses will reach thirty-five tons, while none will fall below thirty tons. One hundred and fifty-four men in the iron works are now bending their energies to accommodate the rapid building of these locomotives, besides carrying on the general business of the shop. The whole is under the supervision, so far as iron work is concerned, of one of the most methodical and careful of foremen, Laehells.

NEVADA BORAX.—The Carson Mint, and nearly all of our assay offices and mills and mining companies are now using borax manufactured at the borax fields of Columbus District, in this State. The Nevada borax is said to be superior, for all mechanical purposes, to the best English article. A large quantity is used monthly at the Mint, and our mining companies use on an average from 150 to 200 pounds per month each. All our assayers and all the smelting furnace companies use considerable quantities. It is sold here from 26 to 28 cents per pound by the case, each case holding 100 pounds. The Pioneer Borax Company, at Columbus, are now engaged in putting up new works for evaporating, refining and crystallizing, and when these are completed will be able to turn out four tons of the pure article per day, which would be worth \$2,000, counting it at but 25 cents per pound. Besides the company named there are several others that are now at work and the supply of the raw material in the borax fields is said to be inexhaustible.—*Gold Hill News.*

Pacific Cordage Company's Works.

The Alameda *Enclinal* of the 12th says: This new and important enterprise, located just upon the outskirts of our town, will to-day start into practical existence. We visited the colossal establishment on Thursday, and learned that all its intricate machinery had been put in place, and that every essential detail was in complete order for the commencement of work. The engines and hoiler were being tested by competent mechanics, and the first whistle of the steam gauge was sounded, perhaps for our delectation.

The stockholders in the company are all men of wealth, and generally known as gentlemen of excellent business qualifications. They are: Messrs. John Parrott, Peter Donahue, Oliver Eldridge, Wm. Norris, W. F. Bahcock, Tiburcio Parrott, George Howea & Co., Benjamin Hartshorn, Mr. Wilcox, J. D. Farwell, and a Spanish gentleman of means, from Valparaiso.

Owing to the magnitude of the undertaking, the managers found it necessary to draw upon two hemispheres for supplies.

The working capital of the company may be safely set down, in round numbers, at a quarter of a million dollars.

All the machinery is of the latest improved patents, from the noted establishment of Messrs. Todd & Raftery, Paterson, New Jersey. The extreme length of the rope-walk—1,800 feet—affords facilities for manufacturing a longer unbroken coil of rope than has ever yet been made in the world without "doubling," viz.: 230 fathoms, or 1,380 feet.

The capacity of the works will be about 4,000,000 pounds of rope per annum, embracing manilla and tarred cordage—the latter never having before been manufactured in the United States.

The company has been fortunate in the selection of a Superintendent, in the person of Mr. George W. Pitman, a thoroughly practical rope-maker, the inventor of several of the most important improvements known in the business, and a man of ripe experience in Eastern and European rope factories.

The standard which the company will maintain with their manufactures will be that of the best rope manufactured in the Eastern States.

Captain Oliver Eldridge is President of the company; and Capt. J. D. Farwell, who has had a general supervision of the works since their inception, will have the agency for the sale of its products in San Francisco.

About eighty persons will be constantly employed, the majority of them boys and girls—not Asiatics.

The Pacific Cordage company has our earnest wishes for a long-continued and profitable existence.

California Rate of Wages.

The following is a schedule of the daily pay of workmen in the Department of Construction and Repair, Mare Island Navy Yard, established for the months of April, May and June, 1873:

RATINGS.	CLASSES.
Shipwrights.....	1st, \$5 00 2d, 4 00
Borers.....	3 50 3 00
Sawyers.....	4 50
Extra.....	4 50
Millmen.....	4 00 3 50
Shipjoiners.....	4 50 3 75
Cabinet Makers.....	4 00 3 00
Pattern Makers.....	4 50 3 50
Smiths.....	4 00 3 25
Heavy Forgers.....	5 10
Smiths' Helpers.....	2 50 2 00
Machinists.....	4 00 3 50
Iron Platers.....	4 00 3 50
Galvanizers.....	4 00 3 00
Met Makers.....	5 00 4 00
East Builders.....	5 00 4 00
Painters.....	4 00 3 50
Block Makers.....	4 50 3 50
Plumbers.....	5 00 4 00
Coppersmiths.....	4 00 3 50
Coppers.....	4 00 3 00
Engine Tenders.....	4 00 3 50
Firemen.....	2 50
Storemen.....	3 50
Laborers.....	2 35 2 00
Rigger Laborers.....	3 00
Caulkers.....	5 10 4 00
Reamers.....	3 00
Oakum Spinners.....	3 00
Machine Tenders on Dock.....	3 00
Shipkeepers.....	2 00

PLATINUM.—The idea of platinum coinage continues to be a subject of discussion among the scientists of Europe. No other metal, not even gold or silver, possesses so many inherent qualities for such use. It would be proof against forgery on account of its high specific gravity; its scarcity gives it an intrinsic value, and its indestructible nature admirably fits it for standing the wear of constant use. It has already been largely used for medals in France, and successful experiments have been made for converting it into coin. In Russia it was actually used for coin previous to 1845, when it was demonetized by imperial ukase. That step was taken at the time because the ready methods of working and refining the metal were not well understood. That objection is now, however, fully removed.

BORAX discoveries of considerable extent are reported in the Colorado Desert, San Bernardino county. The Borax field near Desert Springs, on the Owens river road, is attracting numbers of prospectors from the surrounding country.

Rich Quartz Discovery.

We have recently learned the particulars concerning the discovery of a rich lode of quartz, near Jesus Maria, in this county, which, taking all the circumstances together, seems more like romance than reality.

Fifteen or Sixteen Years Ago,

Prior to the excitement in quartz mining, an Australian named Peter Carairech lived in Jesus Maria. Subsequently he removed to Alameda county where, engrossed in agricultural pursuits, the recollection of his experience in earlier days among the rugged mountains of Calaveras gradually faded from his memory. Recently, however, the attention of Mr. Carairech having been drawn to the very favorable reports concerning the quartz mines of this county, he became interested in the matter, and in reverting to the scenes of his labor years before recollected having seen an immense quartz vein in the vicinity of Jesus Maria. Precisely where it was located he could not remember—only that it was but a short distance from the mining camp where he formerly resided. The more Mr. Carairech thought about the matter the more strongly became his impression that the ledge might be a valuable one, and

His Increasing Desire

To return and prospect the vein finally led him to communicate the facts narrated above to other parties. The upshot of the matter was the formation of a company who furnished Mr. Carairech with a comfortable outfit and dispatched him to search for the ledge. Arriving in Jesus Maria the prospector found all the old landmarks obliterated, and with nothing but the vague recollections of sixteen years to guide him, commenced this seemingly hopeless exploration. He made his business known to no one, but day after day continued his unavailing quest among the almost inaccessible gorges and impenetrable jungles of chaparral with which that section of the county abounds. Finally, after two months of incessant search his labors were rewarded with success—he discovered the long lost lead!

The Vein,

A very wide one, cropped out in a craggy defile, and the weary prospector was gladdened by the sight of surface ore that sparkled with gold. Mr. Carairech went quietly at work and sunk a hole ten feet in depth upon the ledge, uncovering a vein of uncommon size and richness. Taking a quantity of the ore with him he returned to Alameda to report the favorable intelligence to those interested in the venture.

An Assay of the Rock

Proved it to be rich beyond comparison. The company immediately dispatched Mr. Carairech to the mine again for the purpose of locating the claim in due form and holding it in accordance with the laws of the district. More recently a corps of engineers were sent up, and they are now engaged in surveying the ground preparatory to making an application for a Government title. We understand that the shaft is now about twenty feet in depth and that the ledge shows even better than it did on top. We also learn that the company are possessed of abundant means and are determined to thoroughly prospect the ledge that came into their hands in such a singular manner. We are not apprised of the exact locality of the claim, but hear that it is situated about a mile and a half from the celebrated Horae-thief mine, in the Jesus Maria district. Such, in brief, are the particulars of one of the strangest episodes in the history of quartz mining with which we ever became acquainted.—*Calaveras Chronicle.*

A NEW INDUSTRY IN FLORIDA.—Since my first visit to Florida a new branch of industry has been introduced, the credit of which is given to a lady with a Spanish name, Mrs. Olivarez. Thousands of acres in Florida are overgrown with the dwarf palmetto, a plant which has a shaggy stem lying flat on the ground and rooting itself by fibres from the under side, while its summit is crowned with a tuft of fan-like leaves of a tough fibre. These leaves, dried and bleached in the sun and shredded into strips, are formed into braids, and the braid into hats and bonnets of a texture as flexible, and I should think nearly as durable, as that of the well-known Panama hat. In this way a plant which the settler has regarded as a pest is made to give bread to thousands, and becomes so valuable that its disappearance would be regarded as a misfortune. The names of Mrs. Pucetti, Mrs. Carrano, Mrs. Canova and Miss Usina, over the shop doors in St. Augustine, show how generally the original population of the town have concerned themselves in this branch of industry.—*Cor. New York Post.*

THE PRE-EMPTION LAWS.—It turns out that the bill which passed both houses of the last Congress repealing the pre-emption laws and restricting the acquisition of Government lands to the method of homestead entry, failed to become a law through a technicality. By the neglect of somebody having the bill in charge, it was sent from the Senate to the House without having received the signature of the President of the Senate. The House passed the bill in the last moments of the session. Before the defect was discovered the Forty-second Congress had expired, and with it the term of Vice-President Colfax, who does not appear to have felt authorized to affix his signature to the bill *nunc pro tunc*. And so the measure, which was one of the genuine reform in the land laws, and would have done away with many of the abuses which have grown up under them, fails for another year.

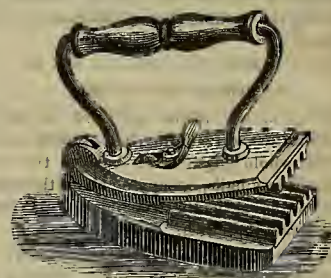
The Riches of the Chilean Deserts.

To the discovery of nitrate succeeded that of borax, and after this the metalliferous deposits, especially in the form of numerous silver lead ores, and lately, the silver mines of Caracoles. Rich and numerous veins of copper are reported within some leagues of Salinas, as well as stratified layers of pebbles of different colors and arranged parallel, and suitable for the manufacture of cameos. A kind of alabaster is also found near Caracoles, capable of taking on high polish, and forming drawing-room ornaments. Lately a stone has been extracted from a depth of thirty yards in the Merceditas mine, containing embedded in it a shell, perfectly formed, in a matrix of chloride of silver. Other veins give petrified impressions of ammonites and hivalves, called technically *evomphalus petangulatus* and *cardium porulosum*. From the Blanco Torre mine more wonderful relics yet of a former world have been brought to light. At a depth of 70 metres shells have been met with, preserving all the lustre of a recent pearl shell. Some round balls, about the size of a hilliard ball, abound, and have been decided to be the eggs of antediluvian birds, of winged reptiles and toad-like monsters that came to that locality to lay their eggs when the bottom of the mines formed the surface of the earth. These round balls in fact, are the eggs of the *plesiosauros* and *ichthyosauros* of geologists, or perhaps the colossal tooth of Professor Owen, called by him the *Labyrinthodon Pachignatus*.—*Panama Star and Herald.*

MINING MACHINERY.—There is building at the Delamater Iron Works, in this city, a system of hoisting machines for the Calumet & Hecla Copper Mines of Lake Superior, which are designed to hoist from four shafts at a time, and from the enormous depth of 2,880 feet, or more than half a mile. There are four drums, each capable of taking out 2,880 feet, of 1½ inch wire-rope, without winding the turns over each other, and each drum will be able to raise 10,000 lbs. at the rate of 350 feet per minute. All four of the machines are driven by a pair of horizontal "Rider Engines" of 300 H. P. Steam will be furnished from six boilers, of 54 feet diameter and 27 feet long. This machinery is to be ready for shipment on the opening of lake navigation in the spring. A fire-proof building will cover the whole plant when erected at the mines. The work is from the designs and superintendence of George H. Reynolds. These works have constructed and are constructing a large number of similar machines, but of less power, for the iron mines in various parts of the country.—*Coal and Iron Record.*

THE LARGEST COMPOUND ENGINE.—It is said that the largest compound engine ever made in this country is now building by John Roach & Son, at the Morgan Iron Works, in New York, for the United States frigate "Tennessee." The vessel ranks second-rate, is 335 feet long, 45 feet beam and has a mean draft of 21 feet, with an immersed midships section of 725.47 square feet. Her displacement is 4,105 tons. The new engine is intended to take the place of the machinery known as the vibration lever engine.

Polishing and Fluting Iron.



This new invention takes the place of two articles needed in nearly every house. As a **POLISHING IRON** it has no superior. The part used for fluting is made of brass, and highly polished. A receipt for making **FAUX GLASS STAIN**, that gives a superior polish, goes with each iron. The Polishing Iron and Fluter, being in one, are both heated at the same time. We are now prepared to furnish them in quantities to suit. Price, \$3.

WIESTER & CO.,
17 New Montgomery street, San Francisco,
General Agents for Pacific Coast.

Something New for the Kitchen.

THE AERATING Egg Beater.



Various devices have been presented to the public for beating eggs, but none, we think, equal to the one herein shown. This, in fact, is the only aerating device ever made, and is very properly called the "Aerating Egg Beater." This Beater, as will be seen by reference to the engraving, is simply a tin can with a cone bottom and a cone dasher, the lower portion of the dasher being perforated with very small holes, as shown. Under this arrangement the upper portion, when forced down, fills with air which is forced through the eggs, thereby finely dividing and thoroughly aerating the mass. It beats one egg as well as half a dozen. For further particulars address

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Manilla Rope of all sizes. Also, Bale Rope and Whale
Line constantly on hand. Tarred Manilla Mining Ropes
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SEAL ENGRAVER,
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Brass and Steel Stamps and Dies, 609 Sacramento street,
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Physician and Operating Surgeon
FOR CHRONIC DISEASES,
213 GEARY STREET, - - - SAN FRANCISCO.
Diseases of a chronic and obstinate character, espe-
cially such cases as have for years, or a lifetime, resisted
the ordinary modes of treatment, are the class of mal-
adies in the treatment of which Dr. Aborn has been
pre-eminent on the Pacific Coast, as well as throughout
the Union, and by his success has achieved for him-
self an enviable reputation. 23v25-1y

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25v30-qy

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SIZE, 40 BY 56 INCHES; SCALE, 8 MILES TO AN INCH.
Handsomely engraved on stone, colored in counties,
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lisher, Salt Lake City, Utah. 10v25-1y

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This Hotel has been newly furnished, and is situated in a
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Temperance Principles.
BOARD, PER WEEK, \$1.00. BOARD AND LODGING, \$1 to \$5.
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CHAS. MONTGOMERY, Proprietor.
52- Passengers and Baggage taken to the Hotel free. -20
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It is Cheaper, Handeomer, more Durable and Elastic
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Ware, and all kinds of Kitchen Utensils, Metal Rop-
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put up, and warranted. 724 Market street, S. F.

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RODGERS, MEYER & CO.,
COMMISSION MERCHANTS

ADVANCES MADE
On all kinds of Ores, and particular attention
PAID TO
COMMISSIONS OF GOLD, SILVER,
COPPER, LEAD, TIN AND OTHER METALS.
4v16-3m

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C. W. STRONG & CO.,
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We purchase Ores, Bullion, etc. Ores worked and
Tents made with care. Also, Assays of Gold, Silver,
Copper, Lead, Tin and other Metals. 23v24-1y

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Assayer and Metallurgical
CHEMIST,
No. 611 Commercial Street,
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IMPORTERS OF AND DEALERS IN
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Chemical Apparatus and Chemicals,
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PHOTOGRAPHIC GOODS, ETC.,
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We would call the special attention of Assayers
Chemists, Mining Companies, Milling Companies
Prospectors, etc., to our large and well adapted stock of
ASSAYERS' MATERIALS
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Chemical Apparatus,
Having been engaged in furnishing these supplies since
the first discovery of mines on the Pacific Coast.
Our Gold and Silver Tables, showing the value
per ounce Troy at different degrees of fineness, and val-
uable tables for computation of assays in Grains
Grammes, will be sent free upon application.
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Important to Miners and Mill Men.
Silver-Plated Copper Amalgamating Plates,
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Of all sizes and in any quantity, furnished to
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Particular attention given to plating goods for
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SAN FRANCISCO GOLD AND SILVER PLATING WORKS,
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Varney's Patent Amalgamator.
These Machines Stand Unrivaled.

For rapidly pulverizing and amalgamating ores, they
have no equal. No effort has been, or will be spared
to have them constructed in the most perfect manner
and of the great number now in operation, not one has
ever required repairs. The constant and increasing de-
mand for them is sufficient evidence of their merit.
They are constructed so as to apply steam directly
into the pulp, or with steam bottom, as desired.
This Amalgamator Operates as Follows.
The pan being filled, the motion of the miller forces
the pulp to the center, where it is drawn down through
the aperture and between the grinding surfaces.
Thence it is thrown to the periphery into the quicksilver.
The curved plates again draw it to the center, where it
passes down, and to the circumference as before. Thus
it is constantly passing a regular row between the grind-
ing surfaces and into the quicksilver, until the ore is
reduced to an impalpable powder, and the metal amal-
gamated.
Settled made on the same principle excel all others.
They bring the pulp so constantly and perfectly in
contact with quicksilver, that the particles are rapidly and
completely absorbed.
Mill-men are invited to examine these pans and settlers
for themselves, at the office, 229 Fremont Street,
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Nevada Metallurgical Works.
RIOTTE & LUCKHARDT,
Consulting Mining Engineers and Metall-
urgists, No. 21 First St., S. F.

WORKING TEST MADE BY ANY PROCESS
-TESTING OF PROCESSES.
Plane furnished for the most suitable Process for Ores.
Assaying in all its Branches.
Analysis of Ores, Minerals, Waters and all other sub-
stances.
Special attention paid to the mining and metal-
lurgy of Quicksilver. 26v11-6m

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Vessels, Apparatus, Sheet, Wire, Etc., Etc.
For all Laboratory and Manufacturing Purposes
H. M. RAYNOR,
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Platinum Scrap and Ore purchased. 23v18

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SWANSEA.

RICHARDSON & Co. have been for thirty years established
in Swansea as Agents for the preparation, Sampling, Assay-
ing, and Sale of Copper, Silver, Gold, Lead, Zinc, and all
other Ores and Metals, for which they have extensive Ware-
houses and Wharves under cover, 1,000 feet of Quay Front-
age within the Floating Dock, and the most complete Ma-
chinery and Appliances. They are also prepared to make
advances against Ores in anticipation of realization, and to
guarantee all payments when required. 17v21-1y

CHARLES F. KIRCHNER,
Sampler and Crusher of Ores,
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NICKEL PLATING.
The San Francisco Nickel Plating Company
Are prepared to plate articles of all descriptions, of any
metal. Cutlery, Liquor Flasks, Pistols, Guns, Swords, Bridle
Bits, Pile Crabs, Hub Bands, Dash Rods, and all arti-
cles of household hardware plated at short notice, and
warranted. Nickel Plate never tarnishes or corrodes,
always retaining its polish until the article is worn out.
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Fourth and Bryant streets. 12v26-3m

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19v4 2am-1p

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1840. OVER THIRTY YEARS 1873.
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PERRY DAVIS'
PAIN-KILLER.

THE PAIN-KILLER
Is equally applicable and efficacious to young and
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Is both an internal and external remedy.

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Will cure Fever and Ague when other remedies have
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Should be used at the first manifestations of Cough
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Is the Great Family Medicine of the Age.

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Will Cure Painter's Colic.

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Is good for Scalds and Burns.

THE PAIN-KILLER
Has the verdict of the people in its favor.

THE PAIN-KILLER
Gives universal Satisfaction.

THE PAIN-KILLER
Beware of IMITATIONS and COUNTERFEITS.

THE PAIN-KILLER
Is almost a certain cure for CHOLERA, and has,
without doubt, been more successful in curing this
terrible disease than any other known remedy, or
the most eminent and skillful Physician. In India,
Africa and China, where this dreadful disease is
ever more or less prevalent, the PAIN-KILLER is
considered by the natives, as well as European resi-
dents in those climates, a SURE REMEDY.

THE PAIN-KILLER
Each bottle is wrapped with full directions for use.

THE PAIN-KILLER
Is sold by all Druggists and Dealers in Family Med-
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The attention of the Medical profession to respect-
fully called to the following preparation of this new re-
medial agent. Eucalyptus and its preparations have been
found useful in obstinate cases of intermittent and Marsh
Fever, often supplanting the use of Quinine. The
poisonous effects of Asthma and Catarrh are greatly controlled,
and in various Kidney diseases and Catarrh of the Blad-
der it seems to act like a specific.

FLUID EXTRACT EUCALYPTUS.
This extract represents in a concentrated form the
medicinal effects of the leaves of Eucalyptus Globulus
THE ELIXIR OF EUCALYPTUS.
This compound presents the properties of the leaves
in a palatable form and elegant appearance. Does
One tablespoonful, to be repeated as often as the case
demands.

Cigarettes of Eucalyptus Globulus, useful in
Asthma, Difficulty of Breathing, Incipient Pleurisy, etc.
Prepared and sold by **JAMES G. STEELE & CO.,**
Chemists and Apothecaries,
No. 521 Montgomery St., between Clay and Commercial,
San Francisco. no28

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CELEBRATED
Worcestershire Sauce.

Declared by Connois-
seurs to be the only good
SAUCE
Caution Against Fraud.
The success of this most
delicious and unrivaled
Condiment having caused certain dealers to
apply the name of "Worcestershire Sauce"
to their own inferior compounds, the public
is hereby informed that the only way to
secure the genuine is to ask for LEA &
PERRINS' Sauce, and see that their names
are upon the wrapper, label, stopper and
bottle.
Some of the foreign markets have been
supplied with a spurious Worcestershire
sauce, upon the wrapper and label of which the names
of Lea and Perrins have been forged. L. & P. give
notice that they have furnished their correspondents
with power of attorney to take instant proceedings
against manufacturers and vendors of such, or any
other imitations by which their right may be infringed.
Ask for LEA & PERRINS' Sauce, and see name on
wrapper, label, bottle and stopper.
Wholesale and for export by the Proprietors, Worces-
ter; Crosbie & Blackwell, London, &c., &c., and by
Grocers and Oilmen universally. 15v24-1y

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22v25-6m

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Manufactured by the San Francisco Gas
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FOR SALE BY ALL GROCERS.
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Manufacturer of
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N. W. corner Natoma and Fremont streets, S. F. En-
trance on Natoma street. 6v23-3m

C. W. MOULTHROP & CO.,
Draughtsmen.
Plans, Specifications, and Estimates for
Machinery of all Kinds.
We also design machines to meet particular demands
and secure or assign the patents on the same.
No. 231 First street, San Francisco. ap19-1m

SITUATION WANTED.
An active and thoroughgoing young man, aged 30, is
now open to engagement. Theoretically and practically
understands the complete metallurgy of lead, silver,
etc. Competent to erect and manage reduction and
technical works, of any magnitude, for lead, silver,
antimony, etc., by any process. First-rate assayer and
analytical chemist. References as to character and
ability. Address A. Z., care of Scientific Press. a12-4t

SITUATION WANTED.
A Thoroughly Practical and Theoretical
Miner, acquainted with the mining business in all its
branches—Assaying, Amalgamating, Surveying, Etc.—
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Address X. Y. Z., this office. m51f

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PATENTS & INVENTIONS.

Telegraphic List of U. S. Patents Issued to Pacific Coast Inventors.

[REPORTED OFFICIALLY FOR THE MINING AND SCIENTIFIC PRESS, DEWEY & CO., PUBLISHERS AND U. S. AND FOREIGN PATENT AGENTS.]

By Special Dispatch, Dated Washington, D. C., April 22d, 1873.

FOR WEEK ENDING APRIL 8th, 1873.*

SPRING MATRESSES.—Henry A. Geeton, San José, Cal.

GANG PLOW.—George W. Mannel, Napa, Cal.

VEHICLE.—Coffee & Bernard, Dixon, Cal.

*The patents are not ready for delivery by the Patent Office until some 14 days after the date of issue. NOTE.—Copies of U. S. and Foreign Patents furnished by DEWEY & CO., in the shortest time possible (by telegraph or otherwise) at the lowest rates. All patent business for Pacific coast inventors transacted with greater security and in much less time than by any other agency.

COPPER.—We see by James Lewis & Son's Liverpool, copper report for April, that business during the past month has been on a very extensive scale. A considerable quantity of ore and regline has been taken by the smelters, who are reported to have made extensive sales of English copper, while the delivery of Chili Bare and Ingote to manufacturers and consumers have been much larger than of late. The statistics of this metal are beginning to assume a more satisfactory position. About 10,000 tons of bare have changed hands at \$84 np to \$90 for Urmenta and good ordinary brands on the spot, and corresponding prices for other brands on arrival. The transactions in Australia also amount to some 6,000 tons at \$92 and \$96 1/2c. per ton. The sales of Chili regline have been 1630 tons at 17 c.; 1150 tons at 17c. 3d. and 750 tons at 17c. 6d.; 1722 tons of ore sold at the Swansea Ticketing at an average price of 16s. 1 1/2d. per ton average produce of 17 per cent., the Cape ore of 33 1/2 per cent. realizing 16s. 9 1/2d. per unit.

The latest quotations were—Bars, Good Brands and Urmenta £90; Lota £89 1/2s. J. Edwards and special brand £91 on the spot, £1 to £1 10c. extra being paid for distant arrival. Ore, 17s. 3d. to 17s. 9d.; Regline, 17s. 9d. 18s. per unit. The Chili exports to March 1st amounted to 9,902 tons in 1871 and 21,022 in 1870. Stocks of West Coast produce are estimated at 21,251 tons, Fine, against 23,056 on the first of March.

SANTA CRUZ POWDER.—The removal of the paper mill from Santa Cruz to Stockton was a matter of much dissatisfaction to the people of the former town but as far as the manufacturing interests of the place are concerned it has turned out just as well in the end. The Santa Cruz Powder Company have purchased the land lately occupied by the paper mill, and will construct works of ten times the value of the paper mill, and give work to more hands. The only question is, like placer or quartz mining, will dust or pulp pay best to those engaged in it. The workmen probably prefer the pulp operation.

MINING MACHINERY IN JAPAN.—H. J. Booth & Co., of the Union Iron Works in this city, shipped to Japan, in the steamer of the 22d inst., a complete quartz mill, with pans and four of Hendy's concentrator. It is probable that as the mineral resources of that country, which are represented extensive, are developed, our foundry man will receive considerable orders for machinery from that quarter.

MCGARRAHAN, the irrepressible, will again appear before the public as contestant in the case of the application of the New Idria Mining Company for a patent to the mine which is claimed by him. He will shortly visit this city to enterintend his adjustment suite, brought in the courts of this State.

THE MILLER platform is to be substituted for those in use on the passenger cars of the Central Pacific Railroad Company. The shops at Sacramento are all busy in constructing them; 600 having been ordered at once.

THE RANDOLPH Gold mines at Coos Bay are now attracting considerable attention; they were discovered in 1853 and have been worked to some extent ever since.

THE machinery for the Holly Water Works of Sacramento has been shipped from the East.

IMPROVED WAGON BRAKE.—The address of Oliver Fish, inventor of the self-acting wagon brake, recently illustrated in this paper, is at Coulterville, Mariposa Co., Cal.; not Centerville.

BORAX.—In our issue of the 12th inst., we gave a description of Mr. Gretzkow's process for the extraction of boric acid, and stated that we understood that work would soon be erected in Nevada, to be run by this process. A subscriber wants to know in what locality they are to be erected. We are informed by the parties interested in the claims that these works would be erected at Deed Horse Wells, in Churchill county, Nevada. We do not know how soon they will be put up or what their capacity will be.

THE Pioche Record says: Probably as many as a hundred miners have left here in the last week or ten days for the White Pine mines, it being understood in Pioche that mining labor is in demand up that way.

NARROW GAUGE.—It is stated that L. L. Robinson and others are about to commence the survey of a route for a narrow gauge railroad from Colfax to Grass Valley and Nevada City.

THE RAILROAD BRIDGE crossing the Kenebe River, at Kendalls Mill, Me., and belonging to the Portland and Kennebec Railroad Company was burned down this week. The loss was over \$100,000.

LEAD IN LIVERPOOL is very active and some manufacturers are asking an advance upon the quotations of the 1st of April of £22 17s. 6d. to £23 5s. for good brand of English.

THE RISON IRON WORKS of this city have sold upwards of 200,000 worth of mining machinery to various companies on the Comstock lode during the past year.

THE MENDOTA MILL.—The last load of machinery for the Nevada Company at Highland, has arrived at its destination and the mill will now be running.

ANOTHER FLYING MACHINE is being constructed in this city by J. C. Feirview, who will test his invention on the 1st of May.

SILVER.—Rich silver discoveries are reported forty miles southeast of Bridger, in Wyoming Territory, at the head of Uintah Valley.

THE CURVES on the Pioche and Bullionville Railroad are being strengthened and changed to ensure safety.

ANTIMONY is quoted in Liverpool at £60 per ton for French Star.

QUICKSILVER is quoted in England at £13 15s. per flask.

The offices of the SAN FRANCISCO NEWS LETTER, CAL. CHINA MAIL, CAL. MAIL BOX, and other publications issued at the News Letter Office, have been removed to the New and Spacious Building of the CALIFORNIA PLACARD EXCHANGE, Nos. 605 to 615 Merchant street, above Montgomery.

San Francisco Metal Market.

PRICES FOR INVOICES.

Jobbing prices run from ten to fifteen per cent. higher than the following quotations.

WEDNESDAY, April 23, 1873.

IRON—			
Scotch Pig Iron, 3 ton	60 00	—	—
White Pig, 3 ton	60 00	—	—
Refined Bar, bad assortment, 3 ton	—	—	06 1/2
Refined Bar, good assortment, 3 ton	—	—	06 1/2
Boiler, No. 1 to 4	—	—	05 1/2
Plate, No. 5 to 8	—	—	05 1/2
Sheet, No. 10 to 12	—	—	05 1/2
Sheet, No. 14 to 20	—	—	05 1/2
Sheet, No. 24 to 27	—	—	05 1/2
Home Shoes, per keg	9 00	—	—
Roll Road	11 00	—	—
Norway Iron	—	—	5 1/2
Roller Iron	—	—	5 1/2
Other Irons for Blacksmiths, Miners, etc.	—	—	6 1/2
COPPER—			
Braziers	—	—	35 00
Copper Tin'd	—	—	60 00
O. Rio's Pat.	—	—	55 00
Sheathing, 3/4 in.	—	—	29 00
Sheathing, 1/2 in.	—	—	28 00
Sheathing, Old Yellow	—	—	29 00
Composition Nails	—	—	12 1/2
Composition Bolts	—	—	29 00
TIN PLATES—			
Plates, Charcoal, 1X box	14 50	—	15 00
Plates, 1 O Charcoal	13 50	—	14 00
Roofing Plates	13 00	—	13 50
Banco Tin, Slabs, 3/4 in.	—	—	42 1/2
Sheet, 3/4 in.	—	—	25 00
Drill	—	—	20 00
Flat Bar	—	—	22 00
Flough Points	—	—	15 00
Russia for more	—	—	17 00
ZINC—			
Sheet	9 1/2	—	10 00
Zinc, Sheet	9 00	—	10 00
NAILS—Assorted sizes	—	—	5 1/2

LUMBER MARKET.

CARGO PRICES		OFFPUT SOUND PINE	
REDWOOD.		-Retail Price.	
Rough, 3/4 in.	\$20 00	Rough, 3/4 in.	\$25 00
Rough, refuse, 3/4 in.	15 00	Floring, 3/4 in.	37 00
Rough clear, 1 in.	52 50	Floring, narrow, 3/4 in.	30 00
Rough, 1 in. refuse, 1 in.	25 00	Floring, 2d quality, 3/4 in.	30 00
Rustic, 3/4 in.	32 50	Latbs, 3/4 in.	4 00
Rustic, refuse, 3/4 in.	21 50	Floring, 3d quality, 3/4 in.	30 00
Surfaced, 3/4 in.	32 50	Rough, 3/4 in. linal	4 00
Surfaced, 1 in.	32 50	Rough, 3/4 in.	\$25 00
Floring, 3/4 in.	30 00	Rough refuse, 3/4 in.	20 00
Floring, refuse, 3/4 in.	20 00	REDWOOD-Retail.	
Beated floring, 3/4 in.	32 50	Rough Pickets, 3/4 in.	18 00
Half-inch Surfaced, 3/4 in.	25 00	Floring, 3/4 in.	37 00
Half-inch Siding, 3/4 in.	30 00	5 Fancy Pickets, 3/4 in.	30 00
Half-inch siding, ref. 1/4 in.	16 00	Siding, 3/4 in.	27 50
Half-inch, Surfaced, 3/4 in.	25 00	Tongued and Grooved, 3/4 in.	30 00
Half-inch Surfaced, 1 in.	25 00	Floring, 3/4 in.	37 00
Half-inch Battens, 3/4 in.	22 50	Do do refuse, 3/4 in.	27 50
Pickets, rough, 3/4 in.	14 00	Half-inch surfaced, 3/4 in.	40 00
Pickets, rough, p'nd.	15 00	Rustic, 3/4 in.	42 50
Shingles, 3/4 in.	3 00	Shingles, 3/4 in.	3 50

Mining and Other Companies.

Noting to the time necessary to mail the present large edition of the Mining and Scientific Press, we are obliged to go to press on Thursday evening—which is the very latest hour we can receive advertisements.

Angels Quartz Mining Company—Principal

place of business, 408 California street, San Francisco. Location of works: Angels Mining District, Calaveras County, California. Notice.—There are delinquent upon the following described stock, on account of assessment (No. 36), levied March 4th, 1873, the several amounts set opposite the names of the respective shareholders as follows:

Name.	No. Certificate.	No. Shares.	Amount.
T. D. Mathewson.....	3	300	\$450 00
T. D. Mathewson.....	4	314	471 00
T. D. Mathewson.....	5	500	750 00
T. D. Mathewson.....	17	26	39 00
T. D. Mathewson (not issued).....		325 5-7	487 57
J. H. Fish.....	20	342 6-7	514 29
J. H. Fish, Trustee.....	20	50	75 00
J. H. Fish, Trustee.....	21	50	75 00
J. H. Fish, Trustee.....	22	50	75 00
J. H. Fish, Trustee.....	23	50	75 00
M. B. Fish.....	3	1000	1500 00
R. M. Anthony.....	18	100	150 00
R. M. Anthony.....	19	45 5-7	68 57
R. M. Anthony.....	19	50	75 00
E. H. Sawyer.....	11	800	1200 00
E. H. Sawyer.....	12	428 4-7	642 86
Geo. Osmond.....	13	200	300 00
Geo. Osmond (not issued).....		115 2-7	172 83

And in accordance with law and an order made by the Board of Directors, on the 4th day of March, 1873, so many shares of each parcel of such stock as may be necessary, will be sold at public auction, at the office of Manrice Doro & Co., 327 Montgomery street, San Francisco, Cal., on Monday, April 22nd, 1873, at 2 o'clock P. M., of each day, to pay said delinquent assessment thereon, together with costs of advertising and expenses of sale.

GEORGE CONGDON, Secretary.

Office, Room No. 1, 408 California Street, San Francisco, California (up stairs). a5-3t

POSTPONEMENT.—Angels Quartz Mining Company. The above sale is hereby postponed for thirty days, at the same hour and place.

ap19 GEORGE CONGDON, Secretary.

Columbia Smelting and Mining Co.—

Stockholders' Meeting. A meeting of the stockholders of the Columbia Smelting and Mining Co., for the election of a board of Trustees for the ensuing year, and for the transaction of such other business as may come before it, will be held at the office of the Company, Room 14, No. 408 California street, on the 30th day of April, at 1 o'clock P. M.

J. W. TRIPP, Secretary.

Eagle Quicksilver Mining Company—Location

of works, Santa Barbara County, California. Notice is hereby given, that at a meeting of the Board of Trustees of said Company, held on the 18th day of January, 1873, an assessment of fifty dollars (\$50) per share was levied upon the capital stock of said Company, payable immediately in gold coin of the United States, and the said assessment shall remain unpaid on Wednesday, March 19th, 1873, shall be deemed delinquent, and will be advertised for sale at public auction, and unless payment is made before, will be sold on Monday, the 24th day of March, 1873, to pay the delinquent assessment, together with costs of advertising and expenses of sale. By order of the Board of Trustees.

WM. H. WATSON, Secretary.

Office, Room 5 and 6, No. 302 Montgomery street, San Francisco, Cal. m2-5

POSTPONEMENT.—The day for deeming shares delinquent on the above assessment is hereby ordered postponed until Thursday, the 24th day of April, 1873, and the sale thereof until Monday, the 26th day of May, 1873, at the same hour and place. By order of the Board of Directors.

WM. H. WATSON, Secretary.

ap12

POSTPONEMENT.—The day for deeming shares delinquent on the above assessment is hereby ordered postponed until Thursday, the 24th day of May, 1873, and the sale thereof until Monday, the 26th day of May, 1873, at the same hour and place. By order of the Board of Directors.

WM. H. WATSON, Secretary.

ap12

Frear Stone Company of California—Location

of principal place of business and works, City and County of San Francisco, State of California. Notice is hereby given, that at a meeting of the Directors, held on the 1st day of April, 1873, an assessment of two dollars per share was levied upon the capital stock of the Corporation, payable immediately in United States gold and silver coin, to the Secretary, at the office of the Company, No. 414 California street, San Francisco, California. Any stock upon which this assessment shall remain unpaid on the 15th day of May, 1873, will be delinquent and advertised for sale at public auction, and unless payment is made before, will be sold on Monday, the 28th day of May, 1873, to pay the delinquent assessment, together with costs of advertising and expenses of sale.

E. WEGENER, Secretary.

Office, 414 California street, San Francisco, Cal.

Hardy Coal Mining Company—Principal

place of business, San Francisco, California. Notice is hereby given, that at a meeting of the Board of Directors, held on the 26th day of March, 1873, an assessment of one dollar per share was levied upon the capital stock of the Corporation, payable immediately in United States gold and silver coin, to the Secretary, Room 5, No. 333 Montgomery street, San Francisco, California. Any stock upon which this assessment shall remain unpaid on the 1st day of May, 1873, will be delinquent, and advertised for sale at public auction, and unless payment is made before, will be sold on Monday, the 28th day of May, 1873, to pay the delinquent assessment, together with costs of advertising and expenses of sale.

JACOB HARDY, Secretary pro tem.

Office, Room 5, No. 333 Montgomery street, San Francisco, Cal. m2-4t

Ida and Rhoda Lewis Consolidated

Mining Company. There will be a meeting of the stockholders of the Ida and Rhoda Lewis Consolidated Mining Co., at the office of the Company, No. 10 Webb street on Saturday, May 3d, 1873, at 1 o'clock P. M. for the purpose of adopting a code of By-Laws for the company.

A. W. MONSE, Secretary.

San Francisco April 19th 1873. a12w

Lady Esten Tunnel and Mining Company.

Location of principal place of business, No. 35 New Merchants' Exchange, California Street, San Francisco, California. Location of works, Little Cottonwood District, Utah Territory. Notice is hereby given, that at a meeting of the Directors, held on the 17th day of March, 1873, an assessment (No. 2) of five cents per share was levied upon the capital stock of the corporation, payable immediately in United States gold coin, to the Secretary, at the office of the Company, No. 35 New Merchants' Exchange, California Street, San Francisco, California. Any stock upon which this assessment shall remain unpaid on the 17th day of April, 1873, will be delinquent and advertised for sale at public auction, and unless payment is made before, will be sold on Tuesday, the 6th day of May, 1873, to pay the delinquent assessment, together with costs of advertising and expenses of sale.

CHAS. S. HEALY, Secretary.

Office, No. 35 New Merchants' Exchange, California Street, San Francisco, California. m2-2

POSTPONEMENT.—The day for deeming shares delinquent on the above assessment is hereby postponed until Wednesday, April 20th, 1873, and the sale thereof until Tuesday, May 20th, 1873, at the same hour and place. By order of the Board of Directors.

ap19 CHAS. S. HEALY, Secretary.

Keystone No. One and Two Gold and

Silver Mining Company.—Location of principal place of business, 507 Montgomery street, San Francisco, Cal. Location of works, Wallapai Mining District, Mohave county, Territory of Arizona. Notice.—There are delinquent upon the following described stock, on account of assessment levied on the tenth (10th) day of March, 1873, the several amounts set opposite the names of the respective shareholders, as follows:

Name.	No. Certificate.	No. Shares.	Amount.
Clark, J. L.....	4	100	\$25 00
Clark, J. L.....	9	100	25 00
Clark, J. L.....	10	100	25 00
Clark, J. L.....	11	100	25 00
Clark, J. L.....	12	100	25 00
Clark, J. L.....	13	250	62 50
Clark, J. L.....	16	250	62 50
Clark, J. L.....	17	50	12 50
Clark, J. L.....	10	50	12 50
Clark, J. L.....	24	50	12 50
Clark, J. L.....	25	25	6 25
Clark, J. L.....	26	25	6 25
Clark, J. L.....	27	25	6 25
Clark, J. L.....	28	25	6 25
Clark, J. L.....	29	25	6 25
Clark, J. L.....	30	25	6 25
Clark, J. L.....	31	20	5 00
Clark, J. L.....	32	20	5 00
Clark, J. L.....	33	20	5 00
Clark, J. L.....	34	20	5 00
Clark, J. L.....	35	10	2 50
Clark, J. L.....	36	10	2 50
Clark, J. L.....	37	10	2 50
Callon, William.....	80	250	62 50
Callon, William.....	81	250	62 50
Callon, William.....	89	100	25 00
Callon, William.....	90	100	25 00
Callon, William.....	95	25	6 25
Callon, William.....	96	25	6 25
Callon, William.....	114	100	25 00
Callon, William.....	115	100	25 00
Callon, William.....	116	100	25 00
Freoborn, William.....	161	50	12 50
Jewell, T. E., Trustee.....	157	72	18 00
Oppen, Robert.....	127	20	5 00
Stark, William H.....	134	100	25 00
Stark, William H.....	135	50	12 50
Welsh, William.....	152	50	12 50
Welsh, William.....	158	100	25 00
Welsh, William.....	163	50	12 50

And in accordance with law, and on order of the Board of Directors, made on the 10th day of March, 1873, so many shares of each parcel of sold stock as may be necessary, will be sold at public auction at the office of the Company, on the 6th day of May, 1873, at the hour of 1 o'clock P. M., of said day, to pay said delinquent assessment thereon, together with costs of advertising and expenses of sale.

T. E. JEWELL, Secretary.

Office, 507 Montgomery St., San Francisco, Cal. a19

Spring Mountain Tunnel Company—Location

of works, Ely Mining District, Lincoln County, Nevada. Principal place of business, San Francisco, California. Notice.—There are delinquent upon the following described stock, on account of assessment levied on the 15th day of March, 1873, the several amounts set opposite the names of the respective shareholders, as follows:

Name.	No. Certificate.	No. Shares.	Amount.
J. M. Buffington, Trustee.....	235	100	\$20 00
J. M. Buffington, Trustee.....	236	100	20 00
J. M. Buffington, Trustee.....	237	100	20 00
J. M. Buffington, Trustee.....	238	100	20 00
J. M. Buffington, Trustee.....	239	100	20 00
J. M. Buffington, Trustee.....	240	50	10 00
Samuel Baird.....	248	100	20 00
James T. Dean.....	321	1180	236 00
F. M. Freund, Trustee.....	115	25	5 00
F. M. Freund, Trustee.....	186	25	5 00
F. M. Freund, Trustee.....	217	60	10 00
F. M. Freund, Trustee.....	218	60	10 00
F. M. Freund, Trustee.....	219	15	3 00
P. B. Gunn, Trustee.....	184	100	20 00
Geo. H. Hellett, Trustee.....	79	10	2 00
W. I. Jeffard.....	96	20	4 00
C. W. Lomler.....	102	8	1 50
M. S. Martin, Trustee.....	189	38	7 50
F. A. Munroe.....	33	32	6 00
F. A. Munroe, Trustee.....	33	32	6 00
Norbert Moser.....	167	50	10 00
J. H. Marston.....	233	130	26 00
A. G. Prince, Trustee.....	159	100	20 00
A. G. Prince, Trustee.....	259	250	50 00
Geo. Phillips, Trustee.....	201	300	60 00
Geo. Phillips, Trustee.....	202	100	20 00
Geo. Phillips, Trustee.....	203	50	10 00
Geo. Phillips, Trustee.....	204	50	10 00
Geo. Phillips, Trustee.....	257	50	10 00
Wm. H. Preble.....	140	500	100 00
J. T. Pomeroy, Trustee.....	131	87	17 40
J. T. Pomeroy, Trustee.....	285	100	20 00
J. T. Pomeroy, Trustee.....	285	100	20 00
J. T. Pomeroy, Trustee.....	288	10	2 00
M. Tubbs, Trustee.....	210	100	20 00
J. Clem Usher, Trustee.....	299	200	40 00
J. Clem Usher, Trustee.....	300	200	40 00
J. Clem Usher, Trustee.....	301	200	40 00
J. Clem Usher, Trustee.....	302	200	40 00
J. Clem Usher, Trustee.....	304	100	20 00
J. Clem Usher, Trustee.....	306	100	20 00
J. Clem Usher, Trustee.....	307	100	20 00
G. D. Wyman.....	21	5 1/2	1 25 1/2
G. D. Wyman.....	97	51 1/2	10 33 1/2
Andreas Zihl.....	115	15	3 00

And in accordance with law and an order of the Board of Directors, made on the 13th day of March, 1873, so many shares of each parcel of sold stock as may be necessary, will be sold at public auction at the office of the Company, Room 37 New Merchants' Exchange, California street, San Francisco, California, on Monday, the 12th day of May, 1873, at the hour of 1 o'clock P. M. of said day, to pay said delinquent assessment thereon, together with costs of advertising and expenses of sale.

J. M. BUFFINGTON, Secretary.

Office, Room 37 New Merchants' Exchange, California street, San Francisco, California. ap26-3t

Omega Table Mountain Mining Company.

Location of works, Tuolumne County, California. Location of principal place of business, San Francisco, Cal. Notice is hereby given, that at a meeting of the Board of Directors, held on the 8th day of April, 1873, an assessment (No. 1) of five cents per share was levied upon the capital stock of the Corporation, payable immediately in United States gold and silver coin, to the Secretary, at the office of the Company, Room 28, Hayward's Building, San Francisco, Cal. Any stock upon which this assessment shall remain unpaid on the 10th day of May, 1873, will be delinquent and advertised for sale at public auction, and unless payment is made before, will be sold on Wednesday, the 22nd day of May, 1873, to pay the delinquent assessment, together with costs of advertising and expenses of sale. By order of the Directors.

DAVID WILDER, Secretary.

Office, 28 Merchants' Exchange, California Street, San Francisco, Cal. ap12-4t

Phenix Silver Mining Company—Location

of works, Eureka Mining District, Eureka County, Nevada. Principal place of business, San Francisco, Cal. Notice is hereby given, that at a meeting of the Board of Directors, held on the 16th day of April, 1873, an assessment (No. 10) of twenty-five cents per share was levied upon the capital stock of the Corporation, payable immediately in United States gold and silver coin, to the Secretary, at the office of the Company, Room 28, Hayward's Building, San Francisco, Cal. Any stock upon which this assessment shall remain unpaid on the 16th day of May, 1873, will be delinquent and advertised for sale at public auction, and unless payment is made before, will be sold on the 11th day of June, 1873, to pay the delinquent assessment, together with costs of advertising and expenses of sale. By order of the Directors.

JOSEPH MAGUIRE, Secretary.

Office, Room 28, Hayward's Building, 419 California street, San Francisco, California. ap19

Office of the Spring Mountain Tunnel

Company, San Francisco, April 10th, 1873. The annual meeting of stockholders of the Spring Mountain Tunnel Company, for the election of Directors and transaction of such business as may be presented, will be held on Monday, May 12th, 1873, at 2 o'clock P. M., at the office of the Company, Room 37 New Merchants' Exchange, California street, San Francisco, California.

J. M. BUFFINGTON, Secretary.

Orient Silver Mining Company—Stock-

holders' Meeting.—San Francisco, April 21st, 1873. The Annual Meeting of the Stockholders of the Orient Silver Mining Company, for the election of Trustees and the transaction of such business as may be presented, will be held on Monday, May 12th, 1873, at one o'clock P. M., at the office of the Company, Room No. 26, Hayward's Building, 419 California street, San Francisco, California.

JOSEPH MAGUIRE, Secretary.

Schell Creek Mining Company—Location

of principal place of business, No. 304 California street, San Francisco, Cal. Location of works, Schell Creek Mining District, White Pine County, State of Nevada. Notice is hereby given, that at a meeting of the Board of Directors, held on the 10th day of April, 1873, an assessment of ten cents per share was levied upon the capital stock of the Corporation, payable immediately in United States gold coin of the United States, and the said assessment shall remain unpaid on the 14th day of May, 1873, will be delinquent, and advertised for sale at public auction, and unless payment is made before, will be sold on Monday, the 24th day of June, 1873, to pay the delinquent assessment, together with costs of advertising and expenses of sale.

P. W. VAN WINKLE, Secretary.

Office, No. 304 California street, San Francisco, Cal. ap19

Sierra Iron Company—Principal place

of business, San Francisco. Location of works, Sierra and Plumas counties, California. Notice is hereby given that at a meeting of the Board of Directors, held on the 10th day of April, 1873, an assessment of one dollar per share was levied upon the capital stock of the Corporation, payable immediately in United States gold and silver coin, to the Secretary, at the office of the Company, Rooms 5 and 6, No. 606 Montgomery Street, San Francisco, California. Any stock upon which this assessment shall remain unpaid on the 15th day of May, 1873, will be delinquent, and advertised for sale at public auction, and unless payment is made before, will be sold on Tuesday, the third day of June, 1873, to pay the delinquent assessment, together with costs of advertising and expenses of sale. By order of the Board of Directors.

JOSEPH MAGUIRE, Secretary.

Office, Rooms 5 and 6, No. 606 Montgomery Street, San Francisco, California. ap12

Stockholders' Meeting—Office of the

Noonday Silver Mining Company, San Francisco, April 10th, 1873. The annual meeting of the Stockholders of the Noonday Silver Mining Company, for the election of Trustees and the transaction of such business as may be presented, will be held on Monday, April 22nd, 1873, at 1 o'clock P. M., at the office of the Company, Room No. 26, Hayward's Building, 419 California street, San Francisco, California.

JOSEPH MAGUIRE, Secretary.

Table Mountain Alpha Mining Company.—

Location of principal place of business, No. 438 California street, San Francisco, California. Location of works: Table Mountain District, Tuolumne County, California. Notice.—There are delinquent upon the following described stock, on account of assessment (No. 1) levied on the 3d day of February, 1873, the several amounts set opposite the names of the respective shareholders as follows:

Name.	No. Certificate.	No. Shares.	Amount.
J. Y. Dixon.....	1	2000	\$500 00
J. Y. Dixon.....	37	902	225 50
E. L. R. Watt.....	24	300	75 00
E. L. R. Watt.....	25	100	25 00
E. L. R. Watt.....	26	100	25 00
W. N. Harris.....	8	2000	500 00
W. N. Harris.....	38	902	225 50
T. H. Holt.....	22	150	37 50
T. H. Holt.....	40	901	225 25
S. Solomons.....	9	6	1 25
S. Solomons.....	16	1495	373 75
S. Solomons.....	42	900	225 00
Algernon Smith.....	11	500	125 00
Algernon Smith.....	44	225	56 50
B. Marks.....	10	100	25 00
B. Marks.....	15	1500	375 00
B. Marks.....	35	450	112 50
B. Marks.....	41	901	225 25
J. W. Roberts.....	13	500	125 00
J. W. Roberts.....	14	500	125 00
E. A. Richardson, Trustee.....	35	450	112 50
E. A. Richardson, Trustee.....	43	225	56 50
E. A. Richardson, Trustee.....	45	140	35 00
E. A. Richardson, Trustee.....	46	100	25 00
E. A. Richardson, Trustee.....	47	100	25 00
E. A. Richardson, Trustee.....	48	100	25 00
G. W. Bowles.....	17	200	50 00
J. Jacobs.....	18	5	1 25
Wm. Fishel.....	19	100	25 00
Alinda Freeman.....	20	100	25 00
P. H. Cannavan.....	21	200	50 00
John Ashton.....	27	500	125 00
John Ashton.....	28	300	75 00
John Ashton.....	29	100	25 00
John Ashton.....	30	100	25 00
E. Wiatt.....	39	902	225 50

And in accordance with law, and an order of the Board of Directors, made on the 3d day of February, 1873, so many shares of each parcel of such stock as may be necessary, will be sold at public auction, at the office of the company, No. 438 California street, San Francisco, California, on Wednesday, the 2d day of April, 1873, at the hour of 12 o'clock M., of such day, to pay delinquent assessments thereon, together with costs of advertising and expenses of sale.

WM. L. USTICK, Secretary.

Office—438 California street, up stairs, San Francisco, California. m15-3t

POSTPONEMENT.—At a meeting of the Board of Directors of the Table Mountain Alpha Mining Company, held Monday, March 17th, 1873, the above sale of delinquent stock was postponed until Thursday, the 17th day of April, 1873, at 12 o'clock M., of that day, at the office of the Company, No. 438 California street, San Francisco, California. All stock on which the assessment is not paid at said time will be sold.

m29 W. L. USTICK, Secretary.

POSTPONEMENT.—Table Mountain Alpha Mining Company.—San Francisco, April 16th, 1873.—The above sale is hereby postponed until Friday, May 2d, 1873, at the same hour and place. By order of the Board of Directors.

W. L. USTICK, Secretary.

Swansea Mining Company—Location

of works, Kelsey Mining District, El Dorado County, California. Principal place of business, San Francisco, Cal. Notice is hereby given that at a meeting of the Board of Directors of said Company, held on the 28th day of March, 1873, an assessment (No. 2) of two and one-half cents per share was levied upon the capital stock of said Company, payable immediately in United States gold coin, to the Secretary, at the office of the Company, Room 2, 425 Kearny Street, San Francisco, California. Any stock upon which this assessment shall remain unpaid on the twenty-eighth day of April, 1873, shall be deemed delinquent, and will be duly advertised for sale at public auction, and unless payment is made before, will be sold on Wednesday, the twenty-eighth day of May, 1873, to pay the delinquent assessment, together with costs of advertising and expenses of sale. By order of the Board of Directors.

EDWARD P. HAY, Secretary.

Office, 425 Kearny Street, San Francisco, Cal. ap1

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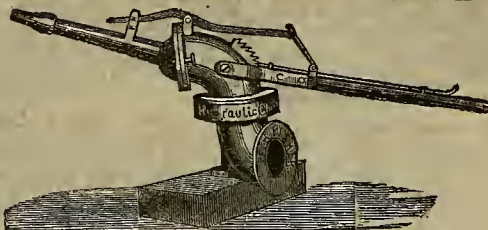
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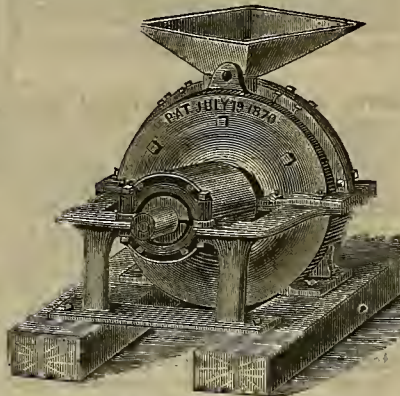


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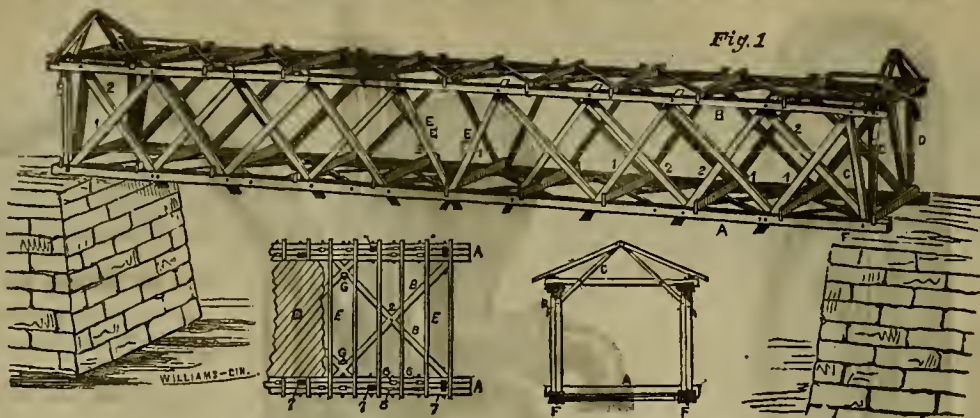
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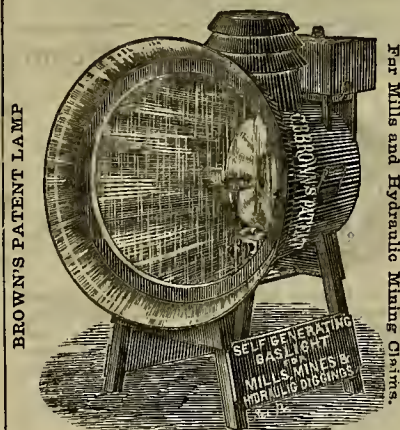
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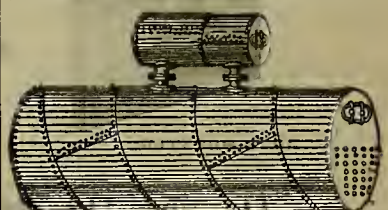
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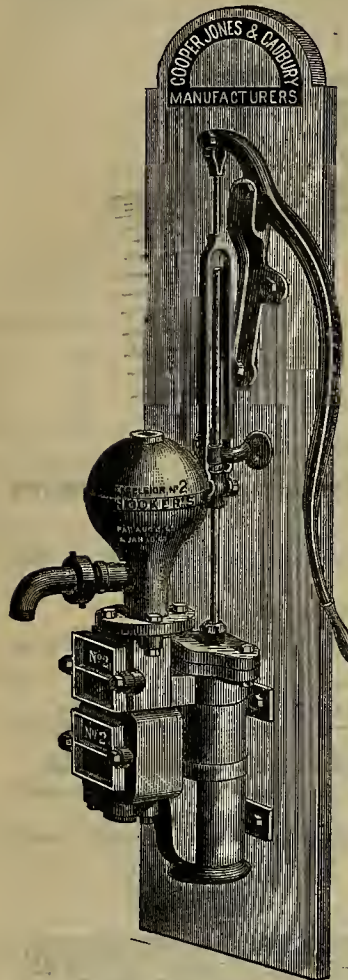
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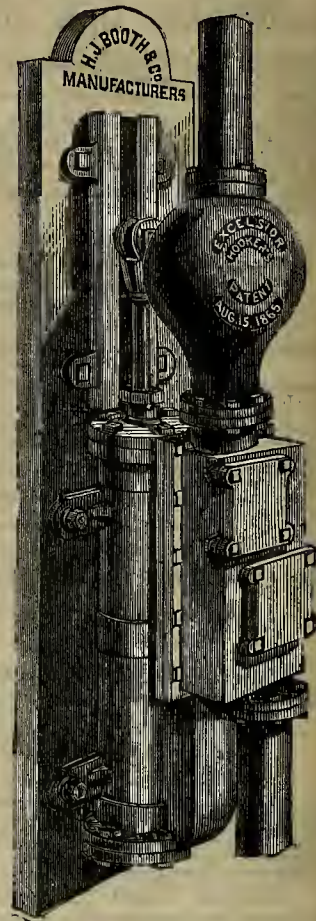
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A. S. HALLIDIE, Patentee,
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SAN FRANCISCO, SATURDAY, MAY 3, 1873.

VOLUME XXVI.
Number 18.

An Unusual Mining Accident.

We see by a dispatch from Nevada City that an accident occurred this week at the Manzanita hydraulic claims near that town, which resulted in the injury of three men—William Wolf, David Anderson and Thomas Bell. The accident is said to have been caused by the explosion of gas in a tunnel in which a blast had been shot off or rather blown out. Gun cotton and Giant powder were used in the blast, but it had only the effect of blowing the tamping out of the hole without breaking up any ground. An hour after the blast had been shot off, the three men named entered the tunnel with a lighted candle to examine the effect, and, when about 40 feet from the mouth, an explosion of gas occurred blowing the men back, injuring them severely. Anderson was the most hurt, though none of them are considered as fatally injured.

Instances of this kind occur frequently in coal mines but they seldom happen in mines of the character of the one referred to. The uncertainty of the causes of many fatal explosions in collieries has led to investigation of the subject in all its phases, of which "explosions from blown out blasts" is one. The Midland Institute of Mining Engineers in England is now engaged in discussing the important question, according to the London Mining Journal and a well known English Mining Engineer has published a paper on the subject.

It was formerly contended and is by some now, that before an explosion can take place there must be another important contributory—the presence of gas, fire damp or "light carburetted hydrogen gas." Yet many explosions have taken place in coal mines where this gas did not previously exist, and the causes are still shrouded in mystery. The causes of a number of fatal explosions are, however, accounted for by the peculiarity of "blown out shots," hereinafter explained.

The exhaustive paper to which we refer seems to intimate that the explosion took place almost immediately after the shot was blown out, but in the case of the Manzanita claim, according to the dispatch, it was a full hour before the men entered the claim, and a light was brought in. In a number of cases cited by Mr. Warburton in his paper it was clearly proven that explosions occurred in the mine after "blown out shots," in places where there was previously no gas.

In one instance mentioned, when the shot was blown out, it was at a great distance from where there was any explosive gas, but in about the space of time necessary to count two, the explosion occurred. Of course the powder exerted its force somewhere, and Mr. Warburton explains the matter as follows: The powder put in the hole was considerable; the amount of force it would exert is difficult of calculation. Of one thing there was no doubt, from the loud report and its consequences, a very small proportion of the energy of the powder was spent in the rock. Some idea of the force of powder may be gathered from recent experiments. When under pressure it was found to be equal to a force of nearly 16 tons on the square inch of the hole containing the charge. As this force was not spent in the hole, where was it spent? On the atmosphere of the mine. When the ignition of a pound of powder in a cannon will send a ball of seven pounds weight, say 1,800 yards, and at the mouth of the cannon at the rate of 1,467 feet per second, what must be the force of this powder striking the atmosphere? It would strike with the force of many tons.

What would be the force on the atmosphere of the mine in the vicinity of this blown out shot. Suppose we consider it pretty nearly good atmosphere, composed of a due proportion of oxygen and nitrogen, with a small proportion of carburetted hydrogen. This strong, quick blow would set at naught the law of the diffusion of gases. The atoms of each separate gas would set off at different velocities according to its specific gravity—the lighter at a speed far quicker than

those of greater gravity. Another law might increase the velocity of the carburetted hydrogen—that of absorption as it is very high in this gas, being per 100—air 1; carburetted hydrogen about 400; so it is more than possible the velocity of the atoms of this gas would be greatly augmented by the heat absorbed from the flame of the powder. The atomic velocities according to gravities at atmospheric pressure at a temperature of 32° F. have been ascertained to be nearly as follows:

Oxygen	1513 feet per second.
Nitrogen	1316 " "
Carbon	1885 " "
Hydrogen	4050 " "

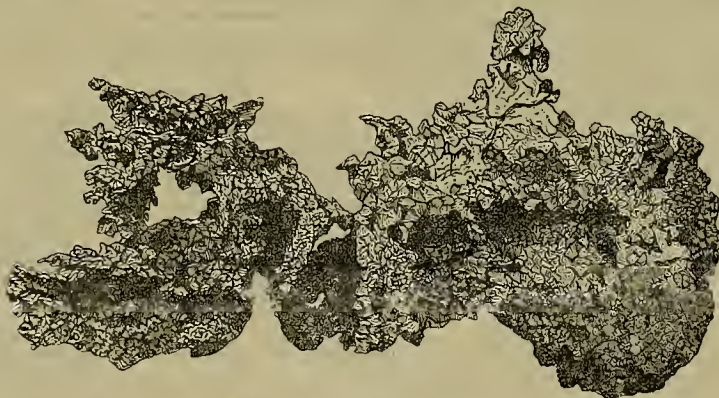
This is the difference of velocity at a pressure of 15 lbs, and would be much greater under the pressure given by the force of the exploded powder, enough perhaps to account for the aggregation of sufficient atoms of carbon and hydrogen to bring the atmosphere up to an explosive point, where previous to the sudden transmission of the atoms of carbon and hydrogen it was not so.

These are the very interesting points argued by Mr. Warburton on the question of "Explosion from blown-out shots." He concludes that if these impressions be confirmed by investigation, it will be dangerous to use powder ever in collieries not supposed to give off large quantities of gas, and in all collieries a power to be used with care and in the hands of com-

Nugget of Crystallized Gold.

Pieces of crystallized gold, are so seldom found that they are highly prized, aside from their mere intrinsic value and great beauty. When they occur in large pieces they are still more scarce and proportionately valuable. The accompanying cut shows one of the most beautiful specimens of dendritic crystallized gold, which has, perhaps, ever been found in the world, of its size. It was found in a seam of decomposed quartz, between the slate, at a depth of about 60 feet from the surface, in August 1865, at what is known as the "Grit" Mining Claim, in Spanish Dry Digging, El Dorado county, California. It weighs about 16 pounds and is valued at \$3,500. Although much larger nuggets than the one described have been found in this State and in Australia, so far as ascertained none has been found presenting such a remarkably beautiful appearance. As will be seen from the cut, the gold branches out in the form of offshoots like the branches of trees.

Strange to say, this beautiful specimen was not



NUGGET OF CRYSTALLIZED GOLD—201 40-100 OZ. IN WEIGHT.

petent men. If this difference in the velocity of the different gases agitated by the explosion would account for the aggregation of sufficient atoms of carbon and hydrogen, to bring the atmosphere up to an explosive point, which previous to the sudden transmission of the atoms of carbon and hydrogen it was not so, as Mr. Warburton argues, could this be the case in the instance of the Manzanita claim?

It would appear that there could not have been any considerable quantity of carburetted hydrogen in the mine previous to the explosion; for if there had been, according to Mr. Warburton's theory, the scattered particles of that gas diffused through the atmosphere of the mine would have been forced together, by reason of the difference between their specific gravity and that of the ordinary atmosphere, until the explosive degree of combination had been reached, when it would have been fired at that point by the mere force of the condensation.

From the fact then that no explosion took place immediately after the firing of the shot, we must infer that the shot liberated, from some chamber in the gravel, a sufficient quantity of carburetted hydrogen to produce an explosion when the flame of the candle was introduced. No explosive gases could have been generated from the burning of either the powder or gun cotton employed in the blast. It is well known that explosive gases—light or heavy carburetted hydrogen—may be formed by the decay of organic matter, such as is often met with in gravel deposits; but it is not often that such gas occurs in quantities sufficient to be dangerous.

N. P. R. R.—On the new 40-mile section of the Northern Pacific Railroad, 160 whites and 300 Chinese are employed.

The Industrial School Movement.

A meeting of the Mechanics' Deliberative Assembly was held at the 12th District Court-room on Wednesday evening, at which there were present 58 members. Gen. A. M. Winn presided.

The report of the Committee on Rules and Regulations was received, discussed and accepted. The most important rule adopted, and that which sets forth the object of the Association was section 2 of Article 1, which reads as follows:

Section 2.—Its object is to discuss a system of labor schools, to enable boys and girls to learn a trade, as part of their education in the common schools, and to provide for the education and employment of all classes of children; prepare bills to be presented to the Legislature of the State for adoption, and to take such steps as may be necessary to secure their passage.

In discussing this article it was remarked that an apprentice system was contemplated in the terms of the article as a matter for legislation.

Efforts are being made to secure a lecture upon the objects of the Association from Hon. Amasa Walker.

The Lady Morehead and Elmer Mine.

In our issue of April 19th 1873, we made reference to the decision of the Commissioner of the General Land Office with reference to the Lady Morehead mine, in Little Cottonwood District, Utah. The title of the case is A. G. Paddock vs. J. P. Taggart. We stated that Paddock's adverse claim to the mine as a continuation of the Elmer lode was rejected by the Commissioner on the ground that no survey had been made of the Elmer lode within the 60 days required by law. This week we received a letter from Mr. A. G. Paddock asking us to make the statement that the above mentioned survey was made within the limits of the prescribed 60 days. Mr. Paddock says: "The parties applying for a patent on the Lady Morehead mine advertised December 5th, 1872. The survey of the Elmer mine was completed January 25th, 1873, and the protest filed on the 31st of the same month. The survey was made by Thomas Davie, Assistant United States Mineral Land Surveyor. The only possible ground for the rejection of my claim lay in the fact that the Surveyor neglected to file his field notes and make affidavit with regard to the amount of work done on the Elmer mine."

Raymond & Ely vs. Hermes.

The hotly-contested and important suit of the Raymond & Ely mine vs. the Hermes mine has been decided by the jury in favor of the Hermes. As we understand it, the effect is only to deny the right of the Raymond & Ely mine to 150 feet of ground on the west of the claim, which was the disputed territory. The case has excited much interest from the magnitude of the interests involved, and the decision has affected the prices of both stocks to a considerable extent, as will be seen by reference to our stock sales.

ASSYRIAN ANTIQUITIES.—A dispatch from London states that the Daily Telegraph's explorer in Assyria has met with great success. He has found eighty inscriptions, including histories known and hitherto unknown, of Assyrian kings. Among his discoveries is a highly important tablet containing a collection of proverbs in two languages, which will aid in the further elucidation of the whole class of inscriptions. Many of the inscriptions have definite dates.

STOCK COMPANIES IN ENGLAND.—An illustration of the mania for joint stock companies in England may be found in the statistics for February relating to the subject. During that month 76 companies were formed in London with a combined nominal capital of £9,777,280. Of these 76 companies 15 had a capital of over £25,000 and under £50,000, sixteen companies were organized for the purpose of mining with a capital of £1,431,700; 23 companies for manufacturing various things and working patents, with a capital of £1,351,580; two tramway companies with a combined capital of £140,000; and one railroad company with a capital of £500,000.

A GOLD NOTE BANK will shortly be established at Santa Barbara with a capital of \$100,000.

CORRESPONDENCE.

Climate of San Joaquin Valley.

EDITORS PRESS:—A farmers steady work and busy thoughts in laying the foundation for another crop, have delayed the preparation of a report in full for 1872 of the temperature and rainfall of our inland climate. But here it is at last, made out for twelve months on the plan adopted for the past year.

It is offered to the readers of the PRESS with some degree of that pleasure which we all experience in a work completed, even though such work be in itself but small and unimportant. It enables us to approximate for the first time, from actual observations for this part of San Joaquin Valley, the

Average and Range

Of temperature for the year, as well as for our Spring, Summer, Autumn and Winter. I say, to approximate, for we must remember that to arrive exactly at such general averages for any climate, requires similar observations to be accurately made, recorded, and calculated for at least ten years; indeed, it is almost the work of a life-time.

Such as it is, however, permit the hope, that it will not be a needless contribution to aid some future worker in making out the meteorology of our State.

We have tried, by careful calculations, from at least a thousand observations made in the course of the year, at or near the hours indicated, to form an accurate and trustworthy

TABLE OF TEMPERATURE AND RAIN ALL.

1872.	Average Temperature.	Monthly Highst.	Lowst.	Rain.
	7 A.M.	2 P.M.	9 P.M.	Mean.
Jan.	40.20	52.30	46.15	46.21
Feb.	44.83	59.11	49.69	51.16
March.	46.16	63.69	50.49	53.28
April.	49.21	66.40	50.80	55.12
May.	56.45	73.39	59.65	61.49
June.	64.57	86.86	65.23	72.23
July.	68.23	92.48	71.15	77.28
August.	69.88	91.72	71.85	77.73
Sept.	63.69	88.25	69.37	73.74
Oct.	59.57	77.19	57.25	61.67
Nov.	59.68	65.66	47.46	50.21
Dec.	56.74	66.71	41.57	45.02
Annual.	52.39	73.04	56.64	60.69

Our locality, as has already been mentioned in the PRESS, is on the plains of Stanislaus County, midway between the Sierra and Coast Range mountains, and about half way between the Tuolumne and Merced rivers. As we are not far from the center of the great grain-producing region of the San Joaquin Valley, our climate may be correctly taken as a type of the climate of the entire valley.

Let us briefly discuss the observations, and record results. It is seen that the table gives, 1st. The average temperature for each month at 7, 2 and 9 o'clock; also the monthly average.

2d. The average temperature for the year at the same hours, as well as the annual average. 3d. The highest and lowest temperature the thermometer indicated each month and for the year.

4th. The amount of rain in inches and hundredths for each month and for the year.

A Few Words of Explanation

About the manner in which these averages were obtained.

For each month, all the observations at 7 A. M., were added and divided by the number of days on which the temperature at that hour was noted. The same was done for all the observations at 2 and 9 P. M. To obtain the monthly mean, these average temperatures for 7, 2 and 9 were added and divided by 3. For the year all the monthly means were added and divided by 12.

The rainfall for 1872, 12.42 inches, must not be confounded with that of the wet season of '71 and '72, which was about 16 inches; nor that of '72 and '73, which to date of writing is about 10 inches. Also, our having no rain in May should be remembered as a very uncommon occurrence. Eight miles east of us on the Merced, and forty miles southeast along the Chowchilla, more than half an inch fell that month. We generally have as much or more. But in dry Springs, like the last, it is usual for our rains to come in spots and streaks throughout the valley.

Two Points of Special Interest

In such a table to which we wish to call attention, are the average and range of temperature for the year. As was mentioned in a previous article, the decimals of temperature are needed only for accuracy in calculations and comparisons. For practical purposes they may be dropped, and if over one-half, the preceding degrees should be called one greater.

1. The average temperature at 7 A. M. is seen to be 52 degrees; at 2 P. M. 73; at 9 P. M. 57; and the

Annual Average, 61 Degrees.

The latter is the most important item in the entire table, as it gives the means of correct comparison with other climates throughout the world.

By adding the averages for the months composing each season, and dividing by 3, we obtain the following average temperatures: for Spring 53, or one degree above the average at 9 P. M. for the year; for Summer 76, or three degrees above the average at 5 P. M.; for Autumn 62, or one degree above the general average for the year; for Winter 47, or five degrees below the average at 7 A. M.

2. By range of temperature is meant the difference between extremes of heat and cold.

From the table, this can be obtained for each month and for the year. At present, we shall call attention only to the

Annual Range, 100 Degrees.

The highest temperature recorded is 110 in June and August; the lowest, 10 in December. This makes the range for the year 100 degrees, which is exactly the same as the range of temperature found to exist in the central portion of the cotton States.

We had the coldest weather by six degrees last December that has been experienced on our plains for five winters past. The lowest previously observed was 16 degrees in Dec. '69. Last winter we had ice an inch thick. In one instance within the knowledge of the writer, the ice was so thick on a deep slough along the Merced river, as to enable a man of over 150 pounds weight to walk across it without difficulty. The like has not been known in this part of California for many years. More than once the Coast Range Mountains were white with snow for several days at a time.

Even in portions of San Joaquin Valley during one storm a few flakes of snow fell. This is a great rarity. Occasionally we have had a small amount of fine hail. As 1872 has been rather a cool year, its average temperature of 60.69, or 61 degrees, will probably be proved by future observations to be somewhat lower than the general annual temperature of our climate. It is, however, such a medium temperature as we would reasonably expect between the mean temperature at Sacramento to the northward which is given as 59.90 and San Diego toward the south, which is 62 degrees. By comparing our California temperatures with remote localities in various parts of the world, we arrive at the following

General Results.

While the mean temperature of San Francisco is nearest to that of Bordeaux, France, Pekin, China, and New York, that of our inland valleys, and Southern California is almost identical with that of Southern France, Central Italy and Southern Japan. To the latter we might also add the Holy Land and that portion of the Southern States along the valley of the Tennessee, in North Alabama, around Huntsville and Tusculuma, when the average annual temperature is not far from 61 degrees.

The following table will show more plainly wherein these climates agree, and how they differ.

TEMPERATURE OF VARIOUS LOCALITIES.

PLACES.	MEAN TEMPERATURE	Range	Latitude
	Of yr.	bet. W. and S.	North.
San Francisco.	55.83	50.59	37 deg. 47 m.
Bordeaux.	56.48	42.08	44 deg. 50 m.
Pekin.	54.86	25.42	39 deg. 54 m.
New York.	53.78	29.34	40 deg. 40 m.
Sacramento.	59.30	48.46	38 deg. 32 m.
San Joaquin Valley.	60.69	47.46	37 (about)
San Diego.	62.00	—	33 (about)
Rome.	60.44	45.69	41 deg. 47 m.
Marseilles.	59.00	45.50	43 deg. 37 m.
Nagasaki.	60.80	39.38	32 deg. 45 m.

The column for range, or difference, between the summer and winter of respective climates has been estimated in the table to show, that though the annual temperature of various places may agree closely, their differences between extremes of heat and cold may vary greatly. Indeed, this is the chief mark of distinction between climates. The range between summer and winter averages in San Francisco is

Only Eight Degrees.

Which makes it as an equable climate, one of the most wonderful in the world. In our inland valleys, in Bordeaux and in Rome, the range is three times as great; in Japan five times, in New York six times, and in Pekin seven times as great.

The most striking agreement we find is between our temperature in San Joaquin Valley and that of Rome. Both the averages and range are almost identical. The remarkable similarity between the climates of parts of California and Italy, which has been so often asserted, is not then a dream, but is proved to mathematical certainty by the stubborn logic of facts.

J. W. A. WRIGHT.

Turlock, Stanislaus Co.

THE GOLD PRODUCT OF AUSTRALIA.—The Melbourne *Argus* states that the product of the Australian gold fields was less during the year 1872 than any previous year since the gold discoveries, because the mines were fewer. Still, the pay per man was better in proportion than it has been in any of the previous years. According to the estimates of that paper, the largest yield of gold in Victoria during the past seven years was in 1866, when the product amounted to 1,536,581 ounces, and the smallest in 1870, amounting to 1,281,841 ounces. Last year the estimated yield was 1,317,102 ounces; but to produce this amount the labor of only 54,651 miners was required, against 73,749 miners, the average number employed in 1866, when the product was 219,479 ounces greater. The *Argus* estimates the average value of the individual miner's earnings at thirty-one shillings per week in 1866, and at thirty-seven shillings per week in 1872. Large investments are now making in prospecting and opening up new leads, and it is expected that the present year will prove an unusually profitable one for the mining industry of Victoria.

The long-promised School of Science in Princeton College will be opened next September.

Borax at Cane Springs.

We make the following extracts from an article on the Borax Fields, from the *Havilah Miner*:

Sunday morning last, early, we left Havilah for the Borax Fields. We went by way of Erskine creek trail for Piute, where we arrived about 2 o'clock P. M.; enjoyed the hospitality of the Bathe Brothers for a couple of hours, looked into the Bright Star mine and through the mill, and then started for Sageland, where we arrived at six P. M., and camped for the night, being entertained by Mr. Joe Bridger and the pleasant society of several gentlemen engaged at the St. John mill. At eight o'clock next morning we started for the scene of the excitement, going by way of Kelseo valley until we came to the first ranch house, when we turned in an easterly course over the plains and mountains into Granite Pass; through this pass to Jawbone Cañon; down this cañon to the desert proper. At the mouth of this cañon you can see

Harry Ball's Station.

Distant about five miles, the road being heavy and through sagebrush. Arrived at the station about two P. M., a distance of twenty-five miles from Sageland and about sixty-five miles from Havilah. Resting an hour at the station, we again mounted our mustang (one of Dan Lightner's best) and rode up the valley, northward, four miles, to Cane Springs.

Here are the Borax Fields.

Here we found Mr. Geo. H. Chapman up to his eyes in borate of lime. After introducing himself, we proceeded with our interviewing. Borate of lime was discovered at this place about the 15th of February last by Mr. H. J. Lent. Mr. Lent was the discoverer of the Columbus, Nevada, borax fields. He was sent for to come and examine specimens found in Kern county and Slate Range, San Bernardino county. He found no borax in the specimens shown him, and started on his return home. He had not proceeded more than three hundred yards from Ball's Station when he saw an "indication" in the road; proceeded to examine it, and found it to be good borate of lime. He tried to be "mum," but his prospecting around caused the secret to leak out, and in less than ten days it spread like wild-fire and soon there was

A Rush of "Boraters"

From all parts of the State. Hundreds of acres are now located by those first to arrive. There is much ground left, but, of course, not as valuable as that now taken, or at least that is our opinion after thoroughly prospecting for ourselves. The claims of

Chapman, Ball and Lent

Are immensely rich—two of their three claims being near and including Cape Springs, the other on the east side of the lake.

Not in the Lake.

These rich deposits of borate of lime are not found in the lake as many have erroneously supposed, they are out from the lake proper and covered with sagebrush. The surface of the earth is covered with a whitish substance generally known as alkali, but which in reality is powdered soda and nitre. These substances are of no definite depth; varying from a dust to four inches. Beneath these layers, which are often indiscriminately mixed, is, if found at all, the borate.

Cane Spring District.

Each claim contains 160 acres. A recorder has been elected and local laws framed for the guidance of claimants. Work to the value of \$50 is required of the holder of a claim. He is also required to have his claim recorded with the County Recorder. This district is about twenty miles west from San Bernardino county line, and sixty from Los Angeles line. We now digress from borate to the surroundings.

Cane Springs.

These springs are white sulphur, but the taste of sulphur is not objectionable; they are on the west side of the lake, four miles north of Ball's Station; it is the proper place and will be the site of the new town of "Boritana." Here Mr. Chapman proposes erecting his works for the reduction of borate, high piles of which are already thrown up.

Mesquite Springs.

These springs are at the head, or north end, of the lake, about eleven miles from Cane Springs, and have a fine flow of water. There are other springs on the west side of the lake, and one has been found on the east side.

Building Material and Fuel.

There is no timber in site. Lumber can be had at Britte's Mill, Tehachepe, about forty miles distant; wood for fuel can be had in abundance about twelve miles distant, up Jawbone Cañon. Sage-brush in abundance all over the desert, which will be used in working borate.

Extent of the Fields.

The extent of the borate fields are estimated at fifteen miles in length by ten in width. The lake proper is not of very great extent; it is dry and covered with alkali—having the appearance of a great sheet of snow—but little borate yet having been found in it.

RAILROADS.—The whole cost of the American 69,000 miles of railroad is about \$3,437,638,749, which is a sum not very much greater than England has spent on her 16,000 miles of railroad.

Pope Valley Quicksilver Mines.

We took occasion recently to visit the Pope Valley Quicksilver mines, eight miles north-east of Calistoga, and eighteen miles northward from the town of St. Helena, where we left the cars, took a horse and rode over Howell Mountains, which is about 2,000 feet high, and down into Pope Valley, 900 feet above the sea. This valley is on a tributary of Pentah Creek, and has considerable area, but most of the soil is gravelly and not rich enough to produce large crops of grain.

The Phoenix Mine.

The Phoenix, the principle mine, was opened in a small way about twelve years ago, but did not begin to produce much until last year, when it turned out 1,047 flasks in six months. It is now in good working condition. It has 6,000 feet of tunnel and drifts, steam hoisting works, a good furnace built to run for six months continuously, and reduce 24 tons of ore per day, (though it has not averaged more than 18 as yet), excellent iron condensers, a boarding house, a good supply of water and wood, a stock of 4,000 tons of ore in sight, beside several seams where more ore can be found when needed, and a patent to the claim, 4,000 by 1,200 feet. We went into the mine and found that it looked well. The drifts are clean and superintended with care and competency. We are indebted to J. H. Cowan and George Porter, foremen, for attentions.

The Washington Mine.

Adjoining the Phoenix on the East is the Washington, which has a patent for 144 acres, a large part of which is covered with ore. Rich cinnabar can be found in the gullies, and the soil of acres contains enough quicksilver to pay for reduction. The pebbles, sand and clay are rich in metal. A drift has been run in 200 feet on the ore, rather to explore its extent than to secure supplies for present workings. Daniel Patten, in charge of the mine, calculates the amount of ore in sight to be 10,000 tons, most of it low grade, but still rich enough to pay. Last year 127 flasks were produced with a profit, working in a small way, and a greater amount is expected this year. The mine needs a larger furnace and improved condenser, and these will be furnished no doubt at no distant time, after certain negotiations for a sale, now pending, shall be completed or abandoned.

Other Mines.

The other quicksilver mines of the country are the Red Hill, Silver Bow, Valley and Pope. The Red Hill mine has a patent covering 128 acres, including much metalliferous ground, and the Silver Bow has about 40 acres. The Silver Bow and Valley mines reduced their ores at the same furnace last year, and exported about 200 flasks.

The general prospects of the Pope Valley quicksilver mines are promising, and the road thither decidedly romantic, passing several very pleasant places on the Howell Mountain. —*Alta*.

PETROLEUM NEAR LOS ANGELES.—The Los Angeles *Express* says: "There can now be no doubt of the success of the enterprise; and Dr. Gelcich will reap the reward of his energetic and persistent labors. He has just returned from San Fernando, and on yesterday sent out an additional force of six men with two twelve-mule teams loaded with supplies. There have been five claims located in the range. There is the Leaning claim, owned by a joint stock company which was incorporated February 10, 1872; they own 160 acres of petroleum deposits, with full title to the land, timber and water rights. Dr. Gelcich has recently purchased all interests in the Rice claim, of which he is now entire owner. There are also the Riley and Tubbs claims, both of which are now being worked with very encouraging results. The oil range is situated thirty-five miles northwest from the city of Los Angeles on the road to Fort Tejon, and thirteen miles from the Mission of San Fernando. Three tunnels have been cut from seventy to one hundred feet in depth, and from these and the two wells the flow of oil is continuous. The petroleum is led through iron pipes to large tanks, and is dipped with buckets from the springs. The cost of transportation to Los Angeles is about two cents per gallon. We have seen the report of Louis Falke, now State Assayer, who estimates the value of the crude petroleum submitted to him for analysis, to be much greater than that of Pennsylvania or elsewhere in the United States."

ANCIENT RELICS.—We are told, says the *Piñon Record*, that a number of additional relics of a bygone civilization have been found between here and Bullionville. We have in our possession a piece of the pottery, which is said to be exactly like similar fragments found in Arizona and New Mexico. It is different from anything in that line we ever saw, but looks more like old-fashioned stoneware than anything else we can think of. The coloring must be of metallic origin, for it is a deep black, and has not faded in the slightest degree through the probable centuries that the fragments have been exposed to storm and sun.

BORAX.—Four thousand five hundred pounds of crude borax, the first shipment, have arrived in Los Angeles. The entire district is now being thoroughly prospected and laid out in claims, numbering nearly two hundred, and extending over an area of 40,000 acres.

MECHANICAL PROGRESS.

On the Use of Steel for Boilers.

From a late number of the *Deutsche Industrie* we learn that Mr. R. L. Haswell, Engineer of the Austrian State Railway Co., spoke on this subject in the Society of Austrian Engineers. He remarked that the accidents which had occurred on railways using locomotive boilers of steel had thus far been only ascribed to the material; yet this was due, on the one hand, to the preparatory working of the plates, and on the other, to the small thickness, as well as to the insufficient mode of assorting them before they were used. Haswell only knows of five instances where such boilers got cracks, four of which occurred in the fire-box plate and one in the cylindrical part. He ascribes their faulty condition to the fact that they were rolled when too warm. This shows that even by purchasing steel plates from the most renowned establishments and of the best quality, one cannot depend on their superiority for the purpose in question, without assorting them with the utmost care; because it can readily occur that in heating the plates one or more get spoiled.

All plates should be subjected to tests for their tensile strength, before they are used. That three tests are perfectly reliable is shown by the fact that of 350 boilers consisting of tested steel plate, only a single one was found torn thus far, and this in the cylindrical part. The box plates not having been tested, it is readily explained that four boilers were injured in those parts. But although these plates had undoubtedly been impaired in their strength by over-heating, they would probably not have been torn if the construction of the boiler supports, did not involve an immense strength.

In order to obtain steel boilers answering all requirements, only correspondingly thick plates and plate of the best material, without any addition (for otherwise the steel is not homogeneous) ought to be used; they ought to be scrupulously assorted according to the texture and tensile strength. After boring or punching they should be carefully annealed, the riveting must be performed with pedantic care, and the bending only with wooden hammers. The steel plates manufactured in Austria are of excellent quality is proven by the manner in which boilers are there constructed, the box front plate, down cover, and the sides of the tubes are only furnished with an edge or border, while in England they are compelled to use angle iron for these connections.

Steel plates are preferable to iron plates, owing to the fact that they possess the same degree of elasticity in all directions (from 12 to 15 per cent.); in iron plate it is in the direction of the fibres, according to Kirkaldy, about 15 per cent., but in a cross direction only 5 per cent. If one proceeds in the manner indicated, says Haswell, steel plates may be used with perfect safety. The boiler manufacturer has the advantage that he finds less plates to throw aside, and the railways on the other hand will have more carefully constructed, stronger and, in the end, cheaper boilers.

RUSSIAN SHEET IRON.—The following is a brief description of the manufacture of Russian iron from Pampelly's "Acroes America and Asia": The magnetic ore is roasted at the mine in heaps of 10,000 to 15,000 tons to remove the little sulphur it contains. It is then smelted in charcoal blast furnaces. After being puddled the iron is rolled into plates about 2½ feet long, 5 inches wide, and half an inch thick. These, after being heated in a furnace with a very reducing flame, are quickly brushed to remove any foreign substance that may have fallen upon them, and are then passed between rolls, the upper one of which is unconnected with the lower, rolling only by friction. By the time the steel is cooled it is about 15 inches wide. Packages of three sheets are now laid in the furnace and then rolled again, after the upper sheet has been brushed and charcoal powder thrown between them to prevent adhesion. If thin iron is bored the sheets are subjected to a third heating in packages of four to six and re-rolled, after which they are trimmed to the proper dimensions. They are now sent to the forge, where they are heated and hammered three times in packages of from sixty to eighty. After the first hammering each sheet is swabbed with a wet mop to harden the surface. It is said that tar is sometimes used for this purpose. Two packages, one hot and one cold, are now mixed in alternate sheets to produce the greenish color in cooling, and the mixed package is then passed backward and forward under a large hammer, and, after this, is again mixed and re-hammered. The superiority of the Russian product, it is said, is due in great part to the cleanliness of the work and to the carefulness and skill of the workmen. Every sheet that is at all spotted is thrown into the second or third class, and the difference in value between these and the first quality is deducted from the pay of the workmen. The clippings of the sheets are worked up into fine iron, and loss of material by the whole process is reduced to from 12 to 15 per cent.

Two blocks of granite, one weighing when dressed 125 tons, the other 90 tons, were recently taken out of a quarry, at Gloucester, Mass., for the base of the Scott monument at Washington.

The Production of Bright Colors on Metals.

The *Hardware, Metals, and Machinery*, published at Birmingham, England, gives the following account of a new method of producing bright colors on metals:

"The German chemist, Puscher, proposes a new method of coloring metals, which can be executed quickly and cheaply. He produces on their surfaces a coating of metallic sulphides analogous to those found in nature—as for example, sulphide of lead. These very stable sulphur combinations, as is well known, are not affected by ordinary agents. According to Puscher's method, in five minutes there may be imparted to thousands of brass articles a color varying from a beautiful gold to a copper red, then carmine red, then dark, then light aniline blue to a blue white, like sulphide of lead, and at last a redish-white, according to the length of time they remain in the solution used.

The colors possess the most beautiful lustre, and, if the articles to be colored have been previously thoroughly cleaned by means of acids and alkalis, they adhere so firmly that they may be operated upon by the polishing steel.

To prepare the solution: Dissolve 1½ ounces of hyposulphite of soda in 1 pound of water, and add 1½ ounces of acetate of lead dissolved in half a pound of water. When this clear solution is heated to 190° to 210° Fahr., it decomposes slowly and precipitates sulphite of lead in brown flocks. If metal is now present, a part of the sulphite of lead is deposited thereon, and according to the thickness of the deposited sulphide of lead, the above mentioned beautiful colors are produced. To produce an even coloring, the articles must be evenly heated. Iron treated with this solution takes a steel-blue color; zinc, a brown color; in the case of copper objects, the first gold color does not appear; lead and zinc are entirely indifferent. If, instead of the acetate of lead, an equal weight of sulphuric acid is added to the hyposulphite of soda, and the process carried on as before, the brass is covered with a very beautiful red, which if followed by a green (which is not in the first-mentioned scale of colors), and changes finally to a splendid brown with green and red iris-glitter; this last is a very durable coating, and may find special attention in manufacture.

Very beautiful marbled designs can be produced by using a lead solution thickened with gumtragacanth on brass which has been heated to 210° Fahr., and is afterward treated by the usual solution of enlphide of lead. The solution may be used several times, and is not liable to spontaneous change."

A NEW GRATE has recently been patented in England, which consists of an ordinary fire grate, with bars in front, and back and sides of fire clay; the whole is elung upon pivots, so that it may be rotated in the same way as a grindstone is, the angle of rotation being perpendicular to the back of the grate or chimney. Small grates, forming segments of a circle, are placed on the bottom and top, and these are so arranged that while the bottom grate is kept fixed, that on the top can be removed to admit of a fresh supply of fuel, so that when desired the fire can be turned topsy-turvy to allow of a free and perfect combustion of the fuel. The result is that the gas from the fresh fuel, in passing through the red-hot coals above, gets perfectly consumed, a good bright fire is obtained, and little or no smoke is left to escape up the chimney, as the combustion is as nearly perfect as possible. It is said that this grate effects a saving of at least 20 per cent. Dr. Franklin invented a grate on the same principle as the one above described, but why it never came into general use we cannot say. The theory seems to be sound.—*Am. Manufacturer.*

A NEW CAR SEAT.—A Toledo man has just received a patent for a new and useful invention recently completed by him, for an improvement consisting of a combined seat and deck for railway cars. The device comprises a stiff spiral spring, situated in the base of an ordinary shaped stool, in such a manner as to receive the full weight of the occupant of the stool without permitting it to touch the floor. The spring serves to break all the jar and jolt caused by the motion of the train, thus affording a perfectly steady position to the small desk attached to the front of the stool. It is claimed by the inventor that the occupant may write letters or make reckonings while traveling at the rate of thirty miles an hour, with all the ease and legibility attainable in his own counting room. Should this new device be all that is claimed for it, it will prove a very valuable invention for stabilizing time and transacting business while performing a journey.

INCREASE OF IRON WORKS IN 1872.—The increase of the iron industry in this country during the past few years has been unprecedentedly large. Reports for 1872 show that 107 new furnaces were built, and 39 projected, and 36 new rolling mills built and 12 projected—making in all an addition of 194 new works. At the date of the above report there were five Bessemer works in operation in the country and four new ones projected.

SCIENTIFIC PROGRESS.

Gold and Platinum Alloys.

The whole subject of alloys is one of much interest and importance, and its true value in the arts is as yet very far from being fully understood. Comparatively few of the metals possess such qualities as render them suitable to be employed in the arts, alone or unalloyed. It is generally supposed that in the alloys of metals there was a fusion of each metal, and a blending together of the particles of each, so that for all practical purposes the compound should be recognized as one body. But Towne says that though metals may combine when melted together, it is doubtful whether they remain combined after the solidification of the mass; and the wide differences between the melting and solidifying point of certain alloys, appear to indicate that the existence of these compounds is limited to a certain range of temperature. Matthiessen regards it as probable that the condition of an alloy of two metals in the liquid state may be either that of: 1st, A solution of one metal in another; 2d, chemical combination; 3d, mechanical mixtures; 4th, a solution or mixture of two or all of the above; and that similar differences may obtain as to its condition in the solid state.

A curious result in relation to the combination of gold and platinum was recently observed by Dr. James Leelle, of Cincinnati, and communicated by him to the *Scientific American*, which appears to demonstrate that in melting together gold and platinum there is certainly no chemical union, no mechanical mixture; but that the platinum melts and arranges itself in small globules, distinct from one another, retaining their integrity in the melted mass.

The Doctor, in the communication above referred to writes:—"Thinking there might be some method of discovering how metals combine when fused, I made the following experiment, producing a result which is entirely new in the history of the noble metals:

I had a lot of dental gold plates, which had quite a number of small pieces of platinum wire attached, after breaking off the artificial teeth. There must have been about three pennyweights of platinum. The mass weighed nine ounces. I melted and poured the whole into an ingot; it was perfectly fused. On examining the bar closely, not a trace of platinum could be seen. I rolled it through the hand-mill, extending it to three yards in length; then cut it in pieces three inches long. I then exposed it to the actions of acids, in a manner entirely different from my usual method when refining gold foils. After a few hours chemical action, I observed a bright metallic point gleaming through the bars of a crystal cage, which a glass blower made for me for this special case. I took it out, and, on examination, I found it to be platinum. I placed it back again for further action; and, on its final removal, I have now a demonstration in a friable mass in which are seen six pieces of platinum as clear and perfect as if they had been rolled in a mill, and they are retained together by the undissolved gold to convince parties who otherwise would conclude such a result to be impossible. This is the first experiment I have made with arrangements devised by myself; what my success may be with metals lower in the scale, further experiments will reveal."

As if recognizing the fact that a matter of doubt might arise with regard to the above experiment, the Doctor, at the close of his communication says:—"In view of my discovery, I know the chemist and metallurgist will ask me: What new solvent have I found that dissolves gold, and yet leaves the platinum undissolved at the same time? I desire making further experiments before fully explaining my methods.

SCIENCE AND THE TRADES.—It was one of Colridge's most pregnant sayings that "every true Science bears in itself the germ of a cognate profession, and the more trade is elevated into profession the better." In France this truth has been for many years appreciated, and to this we believe the success of French enterprise in Italy and Spain is largely attributable. Any one who considers on the one hand, the overcrowded state of our learned professions, and on the other, the abundant room for scientific ability in numerous branches of manufacture and production, can hardly deny that a great waste of English intellect might be saved, and that an immense addition to our national resources might be effected by the elevation on the shoulders of science of various common occupations into skillful professions. We must, moreover, include in the waste of intellect all the ingenuity which debases trades by allance with adulteration and counterfeit production.—*Saturday Review.*

As an evidence of the practical progress which science is making there will be shown at the Vienna Exposition a special department for the display of useful products, made from what was the waste material of manufactures at the time of the London Exhibition of 1851.

SACCHARINE MATTER IN MUSHROOMS.—A. Minntz says that mushrooms yield a syrup, readily crystallizable; which presents all the properties of the sugar obtained from the manna of the East.

THE SUN'S RAYS, in passing through plain glass of uniform thickness is very much diminished, but not nearly as much so as heat from other sources.

Brain and Thought.

To regard thought as a secretion is reducing mentality, affection, reasoning, soul, spirit, or whatever there is of us distinct from the material organization that perishes, to a mere process, or circumstance, that has no absolute existence in and of itself, but is merely a transient manifestation of matter, as is said of nascent oxygen being ozone, of electricity being a mode of motion.

To say that mind is a property, or the effect of organization, is to reverse the order of nature. Mind is the cause of organization. Bodies do not create mind but mind creates them. The house does not make the tenet, but the person constructs the habitation. Nothing can form or produce anything superior to itself; effects can never be greater than their causes; nor can matter originate or produce anything different from matter; and as mind is entirely different from matter, in all of its laws, qualities, and manifestations, it follows that it has an existence independent of matter.

The secretions of the human organism are certain fluids to be used in its formative processes, as saliva, gastric juice, etc. Thought is no more like saliva or gastric juice than it is like a potato or a pumpkin. It is no more like bile than it is like a rotten apple or decayed cabbage.

What is thought! Thought is mental recognition. When the mind, through its general organ, the brain, and through its special instrumentalities, the five senses, takes cognizance of an object or thing, that recognition is a thought, a perception, an idea, a fact. Secretions and excretions only relate to the vital processes. Thought relates to external objects and other beings. A recognition of several objects or things constitutes thinking; a recognition of their relations to each other is the mental process of comparison; and a recognition of the principles into which the facts or data of knowledge (thoughts) may be arranged is the mental operation of reasoning. If thought is a secretion so is feeling, and so are all mental phenomena; and the great mysterious "ego" of the metaphysicians is nothing but a molecular transformation, or a chemical decomposition. How are thoughts and feelings, on the theory of secretion, communicated from one person to another? Secretions, as all physicians know, can not be transferred from one person to another. How about loving, hating, opinions, education, etc? Are they, too, secretions? And how about dreams, omnambulation, clairvoyance, judgment, will, memory, conscience? Are these secretions?—*Dr. R. T. Trall.*

EFFECTS OF A DRY COLD WINTER.—Prof. Shaler has a communication in one of our scientific periodicals of the winter of 1871-2—one of the driest and also one of the coldest on record. The snow-fall was light, and the ground froze to almost an unprecedented depth, being sufficient throughout the whole of New England to involve the roots of the vegetation and the forests. The tree which suffered most was the arbor-vitæ, more than half of these having died, and the rest being in a critical condition. The red cedar was likewise a great sufferer, as also the yellow and white pines; indeed, all the conifers in New England have been injured to a greater or less degree. The greatest damage was experienced in sandy soils. The only change experienced in animal life noticed by Prof. Shaler is the comparative scarcity of snakes, which he considers to be a very decided feature. The Professor contends that a slight addition to the degree of the drouth and the cold might have made such ravages with our forests as to have modified the climate and brought about a series of changes as great as those which mark the different geological formations of the past.

AUTOMATO TELEGRAPHY.—It is announced that this new system of telegraphy is now finished and in successful operation. By this system it is claimed that fifteen hundred words per minute, in clear characters, can be sent between Washington and New York, a wire circuit of three hundred miles; and that, by the use of a certain kind of automatic repeaters, messages can be sent any number of thousands of miles at the rate of six hundred words per minute. The matter to be sent by this new system is prepared by means of perforating machines, the use of which can be easily learned by any person of ordinary intelligence in ten days' time. These perforating machines can turn out the messages, ready for automatic transmission, at the rate of from one hundred to one hundred and forty words a minute. If the system will really do what is claimed for it, it is second only in importance to the telegraph itself.

FORESTS AND RAINFALL.—A NEW THEORY.—Experiments made by Von Pettenkofer on the amount of water evaporated from an oak tree, show that atmospheric humidity, in so far as it depends upon the presence of forests, is promoted rather by the roots of trees drawing moisture from the earth, than by any attraction exercised on rain clouds by the leaves. The latter serve rather as a outlet through which the moisture drawn from the soil passes into the air. The oak tree observed by Pettenkofer was estimated to have 751,592 leaves, and the total amount of evaporation in a year was computed to be 8½ times more than that of the rainfall on an area equal to that covered by the tree, the moisture exhaled by the leaves being equal to 211½ inches, while that from rainfall was but 25½ inches.

Highest and Lowest Regular Sales—No. Shares Sold—Advance and Decline—for Last 6 Days in S. F. Stock & Ex. Board.

COMPANIES.	Shs. in ft.	FRIDAY.	SATURDAY.	MONDAY.	TUESDAY.	WEDNESDAY.	THURSDAY.	ADVANCE.	DECLINE.
Adams Hill.	300	250 1/2 @ 27	250 1/2 @ 27	250 1/2 @ 27	250 1/2 @ 27	250 1/2 @ 27	250 1/2 @ 27	1 00	12
Alamo.	800	275 1/2 @ 27	275 1/2 @ 27	275 1/2 @ 27	275 1/2 @ 27	275 1/2 @ 27	275 1/2 @ 27	1 00	12
Alpha.	150	210 1/2 @ 27	210 1/2 @ 27	210 1/2 @ 27	210 1/2 @ 27	210 1/2 @ 27	210 1/2 @ 27	1 00	12
Alpa.	2500	115 1/2 @ 27	115 1/2 @ 27	115 1/2 @ 27	115 1/2 @ 27	115 1/2 @ 27	115 1/2 @ 27	1 00	12
American Flag.	125	125 1/2 @ 27	125 1/2 @ 27	125 1/2 @ 27	125 1/2 @ 27	125 1/2 @ 27	125 1/2 @ 27	1 00	12
Amador Tunnel.	1500	115 1/2 @ 27	115 1/2 @ 27	115 1/2 @ 27	115 1/2 @ 27	115 1/2 @ 27	115 1/2 @ 27	1 00	12
Arizona & Utah.	1040	100 1/2 @ 27	100 1/2 @ 27	100 1/2 @ 27	100 1/2 @ 27	100 1/2 @ 27	100 1/2 @ 27	1 00	12
Belcher.	1000	250 1/2 @ 27	250 1/2 @ 27	250 1/2 @ 27	250 1/2 @ 27	250 1/2 @ 27	250 1/2 @ 27	1 00	12
Belt.	250	250 1/2 @ 27	250 1/2 @ 27	250 1/2 @ 27	250 1/2 @ 27	250 1/2 @ 27	250 1/2 @ 27	1 00	12
Bowery.	224	100 1/2 @ 27	100 1/2 @ 27	100 1/2 @ 27	100 1/2 @ 27	100 1/2 @ 27	100 1/2 @ 27	1 00	12
Buckeye.	8000	250 1/2 @ 27	250 1/2 @ 27	250 1/2 @ 27	250 1/2 @ 27	250 1/2 @ 27	250 1/2 @ 27	1 00	12
Butte & Belcher.	250	250 1/2 @ 27	250 1/2 @ 27	250 1/2 @ 27	250 1/2 @ 27	250 1/2 @ 27	250 1/2 @ 27	1 00	12
California.	2500	100 1/2 @ 27	100 1/2 @ 27	100 1/2 @ 27	100 1/2 @ 27	100 1/2 @ 27	100 1/2 @ 27	1 00	12
Chollar.	5000	4 1/2 @ 27	4 1/2 @ 27	4 1/2 @ 27	4 1/2 @ 27	4 1/2 @ 27	4 1/2 @ 27	1 00	12
Columbia.	1100	225 1/2 @ 27	225 1/2 @ 27	225 1/2 @ 27	225 1/2 @ 27	225 1/2 @ 27	225 1/2 @ 27	1 00	12
Cone.	1200	225 1/2 @ 27	225 1/2 @ 27	225 1/2 @ 27	225 1/2 @ 27	225 1/2 @ 27	225 1/2 @ 27	1 00	12
Confidence.	600	165 1/2 @ 27	165 1/2 @ 27	165 1/2 @ 27	165 1/2 @ 27	165 1/2 @ 27	165 1/2 @ 27	1 00	12
Crown Point.	150	72 1/2 @ 27	72 1/2 @ 27	72 1/2 @ 27	72 1/2 @ 27	72 1/2 @ 27	72 1/2 @ 27	1 00	12
Central.	1000	100 1/2 @ 27	100 1/2 @ 27	100 1/2 @ 27	100 1/2 @ 27	100 1/2 @ 27	100 1/2 @ 27	1 00	12
Chapman.	1000	100 1/2 @ 27	100 1/2 @ 27	100 1/2 @ 27	100 1/2 @ 27	100 1/2 @ 27	100 1/2 @ 27	1 00	12
Chief of the Hill.	1000	100 1/2 @ 27	100 1/2 @ 27	100 1/2 @ 27	100 1/2 @ 27	100 1/2 @ 27	100 1/2 @ 27	1 00	12
Chollas.	135	227 1/2 @ 27	227 1/2 @ 27	227 1/2 @ 27	227 1/2 @ 27	227 1/2 @ 27	227 1/2 @ 27	1 00	12
Danby.	1000	100 1/2 @ 27	100 1/2 @ 27	100 1/2 @ 27	100 1/2 @ 27	100 1/2 @ 27	100 1/2 @ 27	1 00	12
Eureka Cone.	1800	112 1/2 @ 27	112 1/2 @ 27	112 1/2 @ 27	112 1/2 @ 27	112 1/2 @ 27	112 1/2 @ 27	1 00	12
Excelsior.	400	250 1/2 @ 27	250 1/2 @ 27	250 1/2 @ 27	250 1/2 @ 27	250 1/2 @ 27	250 1/2 @ 27	1 00	12
Empire.	75	665 1/2 @ 27	665 1/2 @ 27	665 1/2 @ 27	665 1/2 @ 27	665 1/2 @ 27	665 1/2 @ 27	1 00	12
Gold & Curry.	1200	40 1/2 @ 27	40 1/2 @ 27	40 1/2 @ 27	40 1/2 @ 27	40 1/2 @ 27	40 1/2 @ 27	1 00	12
Globe.	400	40 1/2 @ 27	40 1/2 @ 27	40 1/2 @ 27	40 1/2 @ 27	40 1/2 @ 27	40 1/2 @ 27	1 00	12
Hale & Norcross.	3600	35 1/2 @ 27	35 1/2 @ 27	35 1/2 @ 27	35 1/2 @ 27	35 1/2 @ 27	35 1/2 @ 27	1 00	12
Hill & Hunt.	1000	100 1/2 @ 27	100 1/2 @ 27	100 1/2 @ 27	100 1/2 @ 27	100 1/2 @ 27	100 1/2 @ 27	1 00	12
Hermes.	1300	175 1/2 @ 27	175 1/2 @ 27	175 1/2 @ 27	175 1/2 @ 27	175 1/2 @ 27	175 1/2 @ 27	1 00	12
Ida Elmore.	184	543 1/2 @ 27	543 1/2 @ 27	543 1/2 @ 27	543 1/2 @ 27	543 1/2 @ 27	543 1/2 @ 27	1 00	12
Imperial.	1000	40 1/2 @ 27	40 1/2 @ 27	40 1/2 @ 27	40 1/2 @ 27	40 1/2 @ 27	40 1/2 @ 27	1 00	12
Ingomar.	1000	40 1/2 @ 27	40 1/2 @ 27	40 1/2 @ 27	40 1/2 @ 27	40 1/2 @ 27	40 1/2 @ 27	1 00	12
Independent.	600	5 1/2 @ 27	5 1/2 @ 27	5 1/2 @ 27	5 1/2 @ 27	5 1/2 @ 27	5 1/2 @ 27	1 00	12
Finch.	2000	15 1/2 @ 27	15 1/2 @ 27	15 1/2 @ 27	15 1/2 @ 27	15 1/2 @ 27	15 1/2 @ 27	1 00	12
Jackman.	3000	7 1/2 @ 27	7 1/2 @ 27	7 1/2 @ 27	7 1/2 @ 27	7 1/2 @ 27	7 1/2 @ 27	1 00	12
Julia.	250	225 1/2 @ 27	225 1/2 @ 27	225 1/2 @ 27	225 1/2 @ 27	225 1/2 @ 27	225 1/2 @ 27	1 00	12
Justice.	95	121 1/2 @ 27	121 1/2 @ 27	121 1/2 @ 27	121 1/2 @ 27	121 1/2 @ 27	121 1/2 @ 27	1 00	12
Kentucky.	250	250 1/2 @ 27	250 1/2 @ 27	250 1/2 @ 27	250 1/2 @ 27	250 1/2 @ 27	250 1/2 @ 27	1 00	12
Knickerbocker.	1000	100 1/2 @ 27	100 1/2 @ 27	100 1/2 @ 27	100 1/2 @ 27	100 1/2 @ 27	100 1/2 @ 27	1 00	12
Mammoth.	125	300 1/2 @ 27	300 1/2 @ 27	300 1/2 @ 27	300 1/2 @ 27	300 1/2 @ 27	300 1/2 @ 27	1 00	12
Meadow Valley.	720	135 1/2 @ 27	135 1/2 @ 27	135 1/2 @ 27	135 1/2 @ 27	135 1/2 @ 27	135 1/2 @ 27	1 00	12
Mahogany.	1070	135 1/2 @ 27	135 1/2 @ 27	135 1/2 @ 27	135 1/2 @ 27	135 1/2 @ 27	135 1/2 @ 27	1 00	12
Minnesota.	340	3 1/2 @ 27	3 1/2 @ 27	3 1/2 @ 27	3 1/2 @ 27	3 1/2 @ 27	3 1/2 @ 27	1 00	12
Monitor Belmont.	800	40 1/2 @ 27	40 1/2 @ 27	40 1/2 @ 27	40 1/2 @ 27	40 1/2 @ 27	40 1/2 @ 27	1 00	12
Newark.	1400	12 1/2 @ 27	12 1/2 @ 27	12 1/2 @ 27	12 1/2 @ 27	12 1/2 @ 27	12 1/2 @ 27	1 00	12
Ohio.	800	250 1/2 @ 27	250 1/2 @ 27	250 1/2 @ 27	250 1/2 @ 27	250 1/2 @ 27	250 1/2 @ 27	1 00	12
O. H. & P.	1000	100 1/2 @ 27	100 1/2 @ 27	100 1/2 @ 27	100 1/2 @ 27	100 1/2 @ 27	100 1/2 @ 27	1 00	12
Overman.	800	125 1/2 @ 27	125 1/2 @ 27	125 1/2 @ 27	125 1/2 @ 27	125 1/2 @ 27	125 1/2 @ 27	1 00	12
Pacific.	1000	100 1/2 @ 27	100 1/2 @ 27	100 1/2 @ 27	100 1/2 @ 27	100 1/2 @ 27	100 1/2 @ 27	1 00	12
Pioche.	100	100 1/2 @ 27	100 1/2 @ 27	100 1/2 @ 27	100 1/2 @ 27	100 1/2 @ 27	100 1/2 @ 27	1 00	12
Pioche Phoenix.	2400	165 1/2 @ 27	165 1/2 @ 27	165 1/2 @ 27	165 1/2 @ 27	165 1/2 @ 27	165 1/2 @ 27	1 00	12
Page & Panoa.	1000	100 1/2 @ 27	100 1/2 @ 27	100 1/2 @ 27	100 1/2 @ 27	100 1/2 @ 27	100 1/2 @ 27	1 00	12
Pea Vine.	1000	100 1/2 @ 27	100 1/2 @ 27	100 1/2 @ 27	100 1/2 @ 27	100 1/2 @ 27	100 1/2 @ 27	1 00	12
Pheasant.	700	100 1/2 @ 27	100 1/2 @ 27	100 1/2 @ 27	100 1/2 @ 27	100 1/2 @ 27	100 1/2 @ 27	1 00	12
Raymond & Ely.	800	20 1/2 @ 27	20 1/2 @ 27	20 1/2 @ 27	20 1/2 @ 27	20 1/2 @ 27	20 1/2 @ 27	1 00	12
Sage.	160	40 1/2 @ 27	40 1/2 @ 27	40 1/2 @ 27	40 1/2 @ 27	40 1/2 @ 27	40 1/2 @ 27	1 00	12
Seg. Belcher.	350	75 1/2 @ 27	75 1/2 @ 27	75 1/2 @ 27	75 1/2 @ 27	75 1/2 @ 27	75 1/2 @ 27	1 00	12
Sierra Nevada.	350	9 1/2 @ 27	9 1/2 @ 27	9 1/2 @ 27	9 1/2 @ 27	9 1/2 @ 27	9 1/2 @ 27	1 00	12
Senator.	750	3 1/2 @ 27	3 1/2 @ 27	3 1/2 @ 27	3 1/2 @ 27	3 1/2 @ 27	3 1/2 @ 27	1 00	12
Shenandoah.	1000	100 1/2 @ 27	100 1/2 @ 27	100 1/2 @ 27	100 1/2 @ 27	100 1/2 @ 27	100 1/2 @ 27	1 00	12
Silver Peak.	600	30 1/2 @ 27	30 1/2 @ 27	30 1/2 @ 27	30 1/2 @ 27	30 1/2 @ 27	30 1/2 @ 27	1 00	12
South Chollar.	1200	100 1/2 @ 27	100 1/2 @ 27	100 1/2 @ 27	100 1/2 @ 27	100 1/2 @ 27	100 1/2 @ 27	1 00	12
Wash. & Oreole.	1400	20 1/2 @ 27	20 1/2 @ 27	20 1/2 @ 27	20 1/2 @ 27	20 1/2 @ 27	20 1/2 @ 27	1 00	12
Woodville.	1200	100 1/2 @ 27	100 1/2 @ 27	100 1/2 @ 27	100 1/2 @ 27	100 1/2 @ 27	100 1/2 @ 27	1 00	12
Yule Gravel.	400	25 1/2 @ 27	25 1/2 @ 27	25 1/2 @ 27	25 1/2 @ 27	25 1/2 @ 27	25 1/2 @ 27	1 00	12

Our Weekly Stock Report.

There has been quite an excitement in the Stock market this week, and prices advanced more than they have done for some time past. On Tuesday last everything went up on the line of the Comstock, and Savage in particular has been held at a remarkably high figure. A short time ago it was \$38 and this week jumped to \$95, although it has fallen since. Many reasons are given for this rise any of which might be the one; rich ore in the mine of course. During the last two weeks the value of the leading mines has advanced about \$100,000, which shows what the advance has been.

The Crown Point and Belcher mines are turning out large amounts of money as usual. They paid out as dividends this month the aggregate sum of \$1,020,000, the Belcher paying the odd \$20,000. These two dividends are the largest ever paid by these mines. Business at the Stock Board has improved materially within the past two weeks, as the amount of sales will show, if nothing else. For the week ending on the 23d they amounted to over \$300,000 more than the previous week. The sales of this week will probably far exceed those of last. One of the low priced stock which has risen largely is Baltimore Consolidated, which sold for \$1 on Monday and \$1 on Tuesday.

The excitement of the week has been the Raymond & Ely and Hermes suit, which was decided in favor of the latter. The decision denies the right of the Raymond & Ely to 150 ft. of ground on the west of the claim which was claimed by both parties.

On Friday a pretty good business was done in the Stock market, but prices were scarcely so firm as on the previous day.

On Saturday the market was a little stronger and more active, but the fluctuations in prices were immaterial except in the case of Savage, which rose \$4, and Raymond & Ely which fell \$7; Hermes went up \$2.

Very little change in prices was apparent in the Board on Monday, and the market was quiet; Raymond & Ely fell \$9.

On Tuesday morning prices advanced all along the line, especially in Comstock mines. There was quite an excitement in the market at the advance and a good business was done. Savage showed the most marked advance of all—\$37. Belcher rose \$2.60; Chollar, \$7; Hale & Norcross, \$13; Ohio rose \$10; Overman, \$4. There were no transactions in Crown Point. Hermes rose \$5; Meadow Valley, \$1.

Wednesday the market was pretty active, but prices showed a decline, as people were cautious of buying at the comparatively high figures.

To-day there was some excitement in the Stock market in the morning, but a decline in prices was apparent, as will be seen by reference to our Stock Tables.

The following items of interest from prominent mines are collated from letters or telegrams from superintendents on file at the offices of the respective companies in this city.

American Flag.

Superintendent's letter of the 25th says the main shaft is down below the fifth station 106 feet, and they will, immerse

diately start the 6th level, and continue sinking the main shaft. Stopping ore at points mentioned in last report. Carrying ore to mill, and will start mill on flag ore to-morrow.

Amador Tunnel.

Letter of the 26th says the mine shows an improvement this morning in stop above lower drift, and also in winze below, and will furnish us more ore than we calculated on without sinking. The main shaft is going down slowly, the rock being exceedingly hard.

Arizona and Utah.

The letter of the 26th says everything is progressing as usual. Drift east from the shaft, at the 260-foot level, is finely under way. Are now twelve feet from the shaft, and have resumed sinking again. Have been obliged to stop sinking the shaft for two days, in order to get a start with the drift.

Belcher.

Dispatch of the 28th says the ore breasts and stope look well. Stopes on the 1200-foot and 1300-foot levels look splendidly; in very fine ore. Car samples, \$101 per ton.

Dispatch of the 29th says the car samples for that day were \$122 per ton.

Dispatch of the 30th says there is no change in the mine. The 1300-foot level is opening out finely in splendid ore. Car samples, \$119 per ton.

Buckeye.

Letter of the 26th says everything about the mine is going well; east drift looking as though it would change for the better. Winze on first station is doing well. Rock in the bottom prospects very well. Ledge is about two feet thick. The ore breasts look about the same as at last report; ore slips for the 25th, 26th, 27th, were 58 tons.

Chollar-Potosi.

Letter of the 28th says that during the last twenty-four hours there were 170 tons of ore extracted from the mine. During the last twenty-four hours all work was suspended, except at the fourth station, but commenced again this evening, and operations are now fully resumed. Nothing new at any point of the mine since Saturday. Ore slips for the 27th, 28th, 29th, were 100 tons.

Letter of the 29th says that during the last 24 hours 190 tons of ore have been taken out. Car samples, \$32. At the fourth station, in face of the drift, there is a small amount of water seeping through. No particular indications of precious metals are existing there. Main ore producing sections are the same as during the last six days. Ore slips for the 28th, 29th, 30th, were 150 tons.

Caledonia.

Letter of the 29th says there has been no change since last report in second station drift, the ground still continuing quite rough, and working a trifle harder than at last report. No change in winze; still have plenty of water, and consequently slow progress is being made. The general work in and about the mine is going ahead as usual.

Crown Point.

The haulion receipts on the 26th inst. amounted to \$28,169.88, making the total for the month, so far, \$619,224.63. Letter from the Superintendent under date of April 26th says they have shipped for the month of April, up to 26th, 11,753 1/2 tons of ore, which will yield, estimating it at 65 per cent of the assay value, \$333,563.93. General average per ton up to the 26th, \$75.56. The winze being sunk from the 1200 foot level is down 74 feet and is looking exceedingly well. The 1400-foot level south is in 133 feet and is still in that same body of barren quartz that was found on the levels above. The incline is down nearly to the 1500-foot level.

Dispatch of the 28th says the porphyry and barren quartz in the fifth floor crosscut of the 1300-foot level proved to be

Assessments, Meetings, Dividends.

[COMPILED DAILY FOR THE STOCK LEDGER.]

NOTE.—In the Stock Board an assessment is delinquent thirty days from the date of levy, exclusive of that date. The dates given in this list are those of the mining offices.

ASSESSMENTS.—Stocks on the Lists of the Boards.

Company.	Location.	No.	Amt.	Levied.	Delinq't.	Sale.	Secretary.	Place of Business.
Bellevue M. Co.	Placer Co., Cal.	6	50	April 14	May 19	June 9	T. F. Cronise.	433 California st.
Baltimore and M. Co.	Nevada.	2	75	Mar. 31	May 6	May 23	D. T. Bagley.	401 California st.
Chapman M. & M. Co.	Ely District.	25	300	Apr. 4	May 10	May 3	F. Swift.	415 Montgomery st.
Charter Oak S. M. Co.	Nevada.	1	25	Mar. 3	Apr. 9	Apr. 30	G. W. R. King.	411 California st.
Columbus M. & M. Co.	Nev.	50	Apr. 26	May 29	June 19	B. B. Minor.	411 California st.	
Confidence Silver M. Co.	Nevada.	10	1 00	Mar. 18	Apr. 22	May 13	B. Weener.	411 California st.
Con. Virgin M. Co.	Nev.	3	3 00	Apr. 8	May 14	June 6	D. T. Bagley.	401 California st.
Empire M. Co.	Idaho.	3	1 00	Apr. 10	May 17	June 6	O. F. Balcom.	420 Montgomery st.
Empire M. & M. Co.	Washeo	12	50	April 14	May 19	June 9	R. R. Spinney.	320 California st.
Golden Chariot Mining Co.	Idaho.	8	2 50	Mar. 28	Apr. 26	May 17	L. Kaplan.	Merchants' Ex.
Imperial M. & M. Co.	Idaho.	17	3 00	Apr. 14	May 19	June 6	K. J. Burrows.	401 California st.
Ida Elmore M. Co.	Idaho.	9	2 50	Mar. 25	Apr. 23	May 20	Wm. Willis.	419 California st.
Imperial S. M. Co.	Cal.	16	1 00	Apr. 8	May 12	June 3	W. B. Dean.	419 California st.
Independent Gold Mining Co.	Cal.	3	40	Apr. 2	May 23	May 31	G. T. Grimes.	240 Montgomery st.
John S. M. Co.	Ely District.	23	3 00	Apr. 7	May 14	June 3	D. S. Nelson.	401 Montgomery st.
Jackson M. Co.	Nevada.	5	19	Mar. 24	Apr. 28	May 16	H. O. Kibbe.	419 California st.
Julia G. & S. M. Co.	Nevada.	13	1 50	Mar. 14	Apr. 17	May 6	A. Noel.	419 California st.
Justice M. Co.	Washeo	6	61	Apr. 23	May 28	June 18	R. Weener.	414 California st.
Kearney & Becker M. Co.	Nevada.	5	1 00	Mar. 4	May 16	May 28	R. Weener.	Stevens' Bldg.
Mahogany G. and S. M. Co.	Idaho.	8	2 50	Mar. 18	Apr. 10	May 31	E. McFaddin.	1 Ebbess Bldg.
Mammoth S. M. Co.	White Pine.	12	10	Mar. 3	Apr. 6	Apr. 29	J. L. King.	411 California st.
Minnesota.	Idaho.	5	1 00	Mar. 21	Apr. 15	May 15	Fm. Willis.	419 California st.
New York S. M. Co.	Ely District.	30	1 00	Apr. 29	May 20	May 18	D. T. Bagley.	411 California st.
New York Con. M. Co.	Nevada.	3	50	Mar. 24	Apr. 26	May 10	H. O. Kibbe.	419 California st.
Opbir S. M. Co.	Nevada.	50	600	Mch. 27	Apr. 30	May 20	J. Marke.	Merchants' Exch.
Ovrenman Silver M. Co.	Nevada.	23	5 00	Mar. 27	Apr. 30	May 20	W. M. Nelson.	414 California st.
Phenix Silver M. Co.	Ely District.	2	50	Apr. 15	May 16	June 6	G. E. Elliott.	419 California st.
Phenix Silver Mining Co.	Enreka Dist.	10	25	Apr. 16	May 21	June 11	Joseph Maguire.	419 California st.
St. Lawrence M. and M. Co.	Cal.	15	13	Mar. 11	Apr. 12	May 5	W. I. Kip Jr.	111 1/2 California st.
Savage Mining Co.	Nevada.	9	10	Mar. 10	Apr. 12	May 5	H. H. James.	1 Freeman's Fund.
Sevier S. M. Co.	Nevada.	7	50	Feb. 11	Mch. 18	May 6	Henry Bo.	10 Nevada st.
Silver Peak M. Co.	Nevada.	2	75	Apr. 3	May 8	May 28	H. O. Kibbe.	419 California st.
Silver West Con. M. Co.	Eureka.	3	75	Apr. 3	May 15	June 10	F. R. Bunker.	Montgomery Block
Sprine Mountain Tunnel Co.	Nev.	5	25	Mar. 13	Apr. 24	May 12	M. Buffington.	37 Merchants' Ex.
Union M. Co.	Nevada.	2	25	Mar. 15	Apr. 21	May 10	J. F. Buffington.	37 Merchants' Ex.
Washington & Creole M. Co.	Ely Dist.	3	65	Apr. 25	May 23	June 20	F. D. Cleary.	Merchants' Ex.
Woodville G. & S. M. Co.	Idaho Hill.	1	60	Mar. 12	Apr. 15	May 3	A. Noel.	419 California st.

Imperial.

Letter of the 24th says they started the pumps to the 1300-foot level to-day. Everything works well. The mine generally looks more favorable than yesterday.

Letter of the 25th says there is no change of importance at the mine. Think we will get through with the pump to-morrow. Assays from the Empire mine to-day is \$7.41 per ton.

Ingomar.

Dispatch of the 29th says they have let contract and commenced work this evening.

Julia.

Letter of the 24th says the mine is progressing, the same as usual. South drift is looking about the same, except that the ledge has widened a little in the north drift. There has been a little change for the better.

Letter of the 26th says the drifts are making good progress. The north drift has been driven 22 feet—total length, 112 feet. There is a decided improvement in this drift. The south drift has advanced 23 feet—total length, 90 feet. This drift is looking exceedingly well, although there has been no material change.

Drift in the north and south mine are steadily improving at present, more especially the north, which is looking very well to-day. Getting ready to resume sinking, which we shall do next week. Everything is looking favorably.

Justice.

Letter of the 27th says that in the south works, main south drift, 2d station, as we approach the line, shows evidence of improvement, and may produce milling ore. The winze is now down 90 feet below the second station, improves as we go down, and now shows three feet of pay ore; should this continue, connection will be made as soon as possible with the main incline for its extraction. The main incline is 65 feet below the second station, and shows a change of low-grade ore, with better promise, being firm, good looking, and without gyp. In north works, main south drift in 326 feet, changed to hard quartz, with considerable water from west wall. Cresscut number two is in east 51 feet with quartz also and porphyry. Will commence cresscut west this week.

Lady Esten Tunnel.

Letter of the 23d says there is no special change in the appearance of the mine. The rock is quite hard and the formation is in its true position, and we may look for encouraging results any time. The tunnel is now in 250 feet; the fact more completes the contract. The ore vein which we have passed is rather favorable, assaying \$4 in silver and \$5 in gold. Prospects good.

Overman.

Letter of the 26th says they have made 85 feet of drifts during the past week. The face of west drift is in granite and porphyry. Have added 38 feet to this drift since last report. The face of the south drift is in granite and a little quartz, and have made 25 feet during the week. The north drift is in a mixture of granite and porphyry, with little seams of quartz all through it. Have made 22 feet this week.

Ophir.

Letter of the 25th says there has been nothing new to report to-day. Favorable progress is being made at all points but without showing any important changes as yet.

Raymond & Ely.

Dispatch from the Superintendent under date of the 26th says: "I shipped yesterday, \$40,212." This makes the total for the month, so far, \$216,501.

Letter from the Superintendent under date of April 22d says the mill are running well, reducing about 100 tons per day. Have resumed sinking in the shaft, which is now down 16 feet below the eighth level; total depth, 746 feet. Southeast drift on eighth level in 137 feet; rock hard. Drift going southwest is in 52 feet; rock working well. On seventh level, west drift is in 117 feet. Winze in the level is down 67 feet. Sixth level west is down 54 feet. East winze is 32 feet deep; vein three feet wide. Am preparing to sink a new winze on the new ore found in the seventh level. Extracting good ore in vicinity of Panaca shaft.

Dispatch from the Superintendent under date of the 1st inst. says: "The Hermes Co. have the verdict." The effect of this is only to deny the right of the Raymond & Ely Co. to 150 feet of border ground on the west, which was disputed territory.

Silver Hill.

On the 24th we shipped to Bacon mill 49 tons and 1,100 pounds of ore; assays on the same day gave \$17.27 in silver, and \$18.83 in gold, total value per ton \$35.10.

Letter of the 26th says they shipped to the Bacon mill on the 24th inst. 81½ tons of ore, and on the 26th 8½ tons. An assay on the 24th gave \$32.24, and on the 26th 41.01 per ton. The mine is looking very well in both north and south drifts. The second station still continues very hard, but we still keep driving away at it. The mill keeps running quite satisfactorily.

Letter of the 28th says they shipped 84 tons of ore to the Bacon mill on that day.

Shipped to the Bacon mill on the 29th, 50 tons 900 pounds. Assays on the 29th gave \$42.37 and \$22.75; 29th, \$38.50.

Sierra Nevada.

Letter of the 26th says the result of the last clean-up from the battery was \$1,851.20. The amount of ore worked was 693 tons. There is no material change in the mine. Some day it prospects well and the next poor. We are getting nearly all our ore from the northwest body. Have developed two small streaks of ore, which may lead to a large body. They are now from two to three feet wide, and prospect \$3 ore. The prospecting is kept constantly going on. The mill is in good condition and running constantly.

Silver Peak.

Letter of the 23d says the ore is nearly all hauled, and the mill will work it this week. The east drift is in 30 feet from the incline. The rock is getting softer, and still continues in good ore. The drift to the west is unchanged. Both have been quite hard and the progress is rather slow, during the past week. We have but little fire ore, most of the ore being in large pieces. Average sample for the fire ore have gone rather low, but the coarse rock has been good which has made up the whole to the general average. Sample for the 19th was \$84.82 and for the 21st \$56.56 per ton.

Letter of the 25th says the last load of ore was shipped to mill this morning, and the mill begins crushing to-day. Have taken out some very good ore the last two days, especially the coarse lumps which seem to be very rich. Sample for 22d, \$28.54; for 23d, \$19.54; for 24th, \$18.28, which shows a decided improvement. No important change in mine. Ore breasts continue to look well.

Woodville.

Letter of the 26th says the different slopes on the lower level are yielding well of good ore. The first level north, which was abandoned some time ago, we are now reopening, and it shows an increase in the size of the ledge. The rock is very rich, and assays from \$400 to \$500 per ton. A new streak of ore has appeared, resembling the Comstock ore, in this drift, which yields no free gold, but shows silver, sulphur, etc., assaying \$36.14, principally silver. Will make a partial clean-up of Rameled mill to-morrow. The Ione mill started on Saturday, and the copper plates show finely for the time running.

MINING SUMMARY.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned:

California.

CALAVERAS COUNTY.

GOON PAX.—Calaveras Chronicle, April 26:—We learn that Messrs. Moser & Howarth, proprietors of the Sport Hill gulch claim, are doing remarkably well. They have swept away the tailings down to the bedrock for a considerable space, and are now engaged in shoveling the bottom gravel into sluices. With but 3 men employed we understand that they yield of the mine reaches as high as \$700 per week.

NAPA COUNTY.

OUR QUICKSILVER MINES.—Callistoga Tribune, April 24: During the past week, work on our quicksilver mines has been going on steadily, and prospecting has been lively. On Friday last, a fine discovery was made on the rancho of Mr. Wm. A. Stuart, a short distance from the Ida Clayton and Keyatone. The ore is undoubtedly the richest ever seen in this locality, or perhaps any other. This mine has been known to one individual for some time, but as it was not patented he said nothing about it until last week, when he pointed it out to Mr. Stuart for consideration. Mr. W. F. Linton, who is interested with Mr. Stuart in this discovery, is at work with a gang of men opening the mine, and informs us that every stroke of the pick displays the shining cinabar. This mine has been christened the "Yellow Jacket," which name was suggested in a singular manner. In making their first prospect, a nest of yellow jackets were found to have taken up their abode in the ore deposit, and for a time made it rather warm for the prospector. The rock from this mine assays as follows: Choice ore, \$3 18-100 per cent, or \$1,053 per ton. Fair ore, 16 per cent, or \$320 per ton. Average assay, 5 2-10 per cent, or \$104 50 per ton.

IDA CLAYTON.—This mine, also on Mr. Stuart's land, is progressing finely. The tunnel is in about sixteen feet. A good mountain of ore is now striking the ledge. The Goulding mine, owned by the American Quicksilver Co., are taking out 1½ bushels per day from this mine, which is about fifteen miles from Callistoga. A quantity of quicksilver has passed thence through Callistoga, the past week, on the way to San Francisco.

GALENA.—We have seen a rich specimen of galena found somewhere in the neighborhood of the old Kellogg rancho, 4 miles south of Callistoga, where it is said there is an extensive deposit. The exact location has not yet been made public.

SAN BERNARDINO.

A RICH MINE.—Southern Californian, April 26: Several months ago a number of gentlemen formed an association for the purpose of developing a silver mine which had been discovered in Arlington District, about 100 miles from Anaheim. The association is known as the "Virginia Mining Company of Anaheim." The two now at the mine report that they are at work on a ledge 2½ ft. thick, and are down 30 ft. A specimen of the rock which they are now taking out, has been subjected to a rough test, and has been found to contain nearly \$1,100 to the ton. Some of the rock first taken out was sent to San Francisco, and on being assayed was found to contain \$400 to the ton.

SIERRA COUNTY.

DEAD BROKE CLAIM.—Mountain Messenger, April 26: The other day while over south, we visited the Dead Broke Gravel Claim, and found it in excellent working order, paying \$2 to the load. Four men are steadily employed, and more will soon be engaged as the claim is now fully opened.

BATA MOUNTAIN.—This fine gravel claim is still as rich as ever. During the past two weeks \$7,000 has been taken out at an expense of \$2,500. The average yield all along has been about \$2.85 to the car load. Last year over \$54,000 was distributed in dividends. A candle box full of gravel, the other day, yielded 6 ounces of specimens. Amount of capital sunk before reaching pay ground, \$20,000. Average yield per day, \$500. 80 men are steadily employed. A giant powder is used. The tunnels and breasts are dry and the atmosphere pure.

Nevada.

URAL, MAMMOTH.—Reese River Review, April 21: This Co. has been sinking during the winter, but recently, at a depth of 190 ft., has cresscut to the Gould & Curry ledge and drifted north about 30 ft., finding the ledge well defined, 8 feet in width, and carrying from 2 to 3 ft. of first-class milling ore on the foot wall. The Co. is now cresscutting from the bottom of the shaft to the Ural ledge, distant about 60 ft. to the east, which carried much better ore at the surface than the Gould & Curry ledge. Working two shifts.

ESTR BUENO.—The main incline on this mine is now 300 ft. deep, when a cresscut drift, preparatory to commencing the fourth level, has been run to the hanging wall, a distance of 42 ft., through fair milling ore. A cresscut drift has also been run from the shaft to the foot wall, a distance of 35 ft., passing through 10 ft. of ore near the foot wall that will mill \$100 or more per ton. The 2d and 3d levels, 60 ft. apart, have been driven in 70 ft., where a winze connects the two and shows from 4 to 5 ft. of \$100 ore extending from level to level, none of which has yet been stopped out.

SMITH.—A mine which has been bonded to San Francisco parties for the past 4 months, is reported sold; figures not given. The parties to whom the mine was bonded, have been working 5 men on it for the last 6 weeks, finding several large and evidently continuous bodies of ore, assaying from \$70 to \$300 per ton. The location embraces 1,300 ft. in length, with an average width of ledge of over 30 ft. These extensions north and south have been located, covering a distance, in all, of 7,500 ft., through which the ledge is traceable.

CROWN MINE.—ONE.—On this mine R. O. Beatie & Co., are prospecting work diligently with a force of men. The present depth of the incline is 155 ft., from which a tunnel 2d level is being driven each way. On the south the level has reached a distance of 125 ft., showing a 2 to 3 ft. ledge, with a pay streak averaging 10 inches in width of ore that will mill well up in the hundreds. They are now putting a track in the first level, 80 ft. above the bottom of the incline, preparatory to stopping the upper backs. Their steam hoisting works are operating finely.

BRADLEY.—A mine, one of the earliest locations in Union District, Bradley and Hartman, have been working quietly for the past 3 months, and have on their dump sixty tons of ore, that will mill not less than \$200 per ton, with plenty more in reach without any expensive outlay in the way of dead work.

WASHOE.

BELSHOE.—Gold Hill News, April 26: Daily yield about 550 tons from the 1000, 1100, 1200 and 1300 ft. levels. The main incline is down 115 ft. below the 1200 ft. level, with the bottom in hard dry rock. The timbering of the main south drift at the 1200 ft. level is progressing well, and as soon as completed, drifting south will be resumed and pushed ahead as fast as possible toward the main incline. At the 1200 ft. level the north drift from the incline is in 244 ft. and the south drift to connect with it is in 404 ft. leaving about 85 ft. to run in order to complete the connection. Some unusually fine ore is complete from the breasts and slopes of the 1300 ft. level, by way of the Yellow Jacket shaft, and the other ore producing sections of the mine looking and yielding finely as usual. The bullion receipts for the present month will exceed those of the last, and with the large surplus left in the treasury after paying the last dividend, an increased dividend may be looked for. The machinery and everything works well.

CROWN POINT.—Daily yield 450 tons from the 1,200 and

1,300-ft. levels. The incline is down 170 ft. below the 1,400-ft. level. The bottom is in hard blasting rock, with very little water coming in. The south drift, 1,400-ft. level, is in 140 ft., the rock barren, but easily worked with a pick. The cresscut east from the 5th level above the 1,300-ft. level, 100 ft. north of the Belcher shaft is again in ore. The slopes in all the levels above the 1,400 are looking finely. The new pump will be in running order next week.

CON. VIRGINIA.—Main shaft down 352 ft. below the 500-ft. level. Ground works favorably, allowing of good progress. The great heat in the drift north from the Gould & Curry, at the 1,167-ft. level, does not prevent very fair progress being made under the circumstances. No new ore developments.

CROWN POINT RAVINE.—Have cleared out the main shaft down to the first station, 250 ft. from the surface, and the old west drift at that point a distance of 40 ft. This drift has been driven ahead about a week 12 ft. In new ground, composed of a clay and porphyry formation being evidently the east wall of the ledge. The increase of water was so great that further drifting had to be suspended and now hoisting arrangements erected, which will be completed and drifting resumed next Monday.

CHOLLAR. POROSI.—Daily yield 160 tons, assays of which average about \$33 per ton. The face of the drift at the 4th station is in quartz, carrying stringer of ore. The various breasts and slopes of the producing stations are holding out well with good prospects ahead.

YELLOW JACKET.—Drifting north and south on the 1,400-ft. level, is making good progress, with no change in the character of the rock. Drifting east on the 1,500-ft. level was resumed last Monday. The pumps keep the water down so that it does not interfere with work on this level. Cresscutting at the 1,300-ft. level with, progresses as usual, with no new developments. This mine is holding about 150 tons per day for the Belcher Co., the ore coming from the 1,300-ft. level.

GOULD AND CURRY.—The new pumps in the incline are completed and working well, draining the water so that sinking can be proceeded with immediately. The promising development of quartz at the 1,500-ft. level, with drift mentioned in our last, shows about the same. No further improvement. The main south drift at the 1,600-ft. level, to connect with the Savage south drift, is actively driving ahead, making good progress. Prospecting at various points going ahead as usual.

HALE & NONCROSS.—Daily yield about 50 tons, principally from the second station level, added by contributions from the 9, 10 and 12 stations. The main shaft is being reinforced for a distance of 300 ft., where the timbers are defective or settled out of shape. General prospects good, with no new level opened.

IMPERIAL.—The powerful new pumping machinery was started last Thursday, and is a great success, moving with less labor than any other on the lead. On trial yesterday, the water in the sump was lowered 5 ft. in three minutes, the pump working alone on the shortest stroke. The water is out of the sump in the main shaft, and to-day the men are taking the mud from the bottom. Work is being pushed energetically in and about this mine. The company are now making a comparative test of wood and coal, carefully weighing and recording everything.

MINT.—The east drift for the ledge, 75 ft. below the surface, is being actively driven ahead. Some very fine ore has been run into about 10 ft. from the main shaft. The vein is about 1 ft. in width. Some of the ore shown us this morning looks very rich in sulphurates, and so closely resembles Crown Point ore as hardly to be distinguished from it. The ore vein mentioned is evidently a spur of the main ledge, and the drift is in about 10 ft. beyond it, with every indication of soon striking the main ledge, as there are several feeders in the face of the drift which apparently lead to it. There is also a noticeable increase of water coming in, which is another favorable indication. The new hoisting works operate smoothly and well.

SAVAGE.—Producing no ore at present. The main south drift at the 1700 ft. level is driving ahead in favorable indications, and the north drift at the 1600 ft. level to connect with the south drift from the Gould & Curry is making as good progress as could be expected considering the great heat. No new ore developments to report, but everything in and about the mine is working well and advantageously.

WOODVILLE.—Daily yield about 20 tons of very superior quality, keeping the Rameled and Ione mills steadily running. The Ione started yesterday, and when some other available mill can be procured, it will be set to work. The slopes on the lower level are yielding well. The drift north, first station, has run into very rich ore during the past week, assaying over \$400 to the ton—more than half silver. The bullion promise of this mine is very flattering at the present time.

WHITE PINE.

THE HIDDEN TREASURE, White Pine News, April 26: This noted property, so well known formerly as one of the leading mines of this section, is now being energetically worked by a large force of men. Proceeding down the east declivity of the Hill, we enter the old tunnel, from which each level has been driven. Ore has been taken. After passing through the broken masses of rock for some 30 ft., we find the most perfect foot wall ever known in Eastern Nevada, or elsewhere, lying at an angle of 44 degrees, pitching east, as smooth as glass, with a slight stratification to the south; it runs almost due north and south, pitching east at an angle of 44 degrees, and is intersected by a tunnel we pass large artificial caves, from which great quantities of rich mineral have been extracted, and on an incline, (following the wall mentioned) at the depth of 230 ft. we arrive at the channel of ore, which is rapidly becoming rich in quality as it is in quantity.

WHEELER TUNNEL.—This immense undertaking was prosecuted for a period of six months. Through the hardest limestone, on a due west course, this work has been prosecuted to develop the truthfulness of the theory that an ore channel would be found at a depth. At a distance of 400 ft. from the face of this tunnel, the smooth foot wall, left in the Hidden Treasure workings above, was found, the distance from the surface being 500 ft. Here a quartz formation marked its appearance, some 80 or 70 feet east of the wall, which contained mineral of small value. The tunnel was run some 30 feet further west, or beyond the wall, and came to solid limestone, here of all indications of mineral. Returning, a drift was started south to prospect the ground under the workings of the Hidden Treasure; the vein matter, with mineral mixed in, being itself in the quartz formation. The wall above is the same as appeared in the Hidden Treasure, 500 ft. above, and, by actual survey, retains the same inclination in degrees as there found, proving it conclusively to be one and identical.

THE PERLESS CHAMBER.—This remarkable body of ore in the Eberhart & Aurora, which we have before attempted to describe, shows no signs of giving out, on the contrary, is daily increasing in size. The quality of ore taken from this superior body, which we have seen on Treasure Hill since the famous Eberhardt days.

MOREY DISTRICT.—From Perlia Rowell who has just returned from a ramble among various districts, we gather several interesting items respecting the mining sections which he visited. The most remarkable of the ore-producing region seems just now to be that of Morey District. We say remarkable, as, by the specimens shown us from the Magnolia, belonging to a New York company, we see 3 distinct and separate characters of mineral. At the surface we are shown yellow chlorides, evidently base in their character, and of but little value for reduction purposes; next we come to a species of antimonial silver ore, impregnated with pyrites of iron; and at the depth of 80 ft. in the shaft we find quartz with horn and ruby silver thoroughly mixed in.

Borax for the Epizooty.

A city paper remarks, that the proprietors of the establishment to refine borax on Powell street near Chesnut, have satisfied themselves that they have found a protection against the epizooty. Knowing that borax has a healing influence on inflammation of the mucous membrane of the month, in the human genus, they gave four ounces daily of it, refined and pulverized, in their food, to each of their horses, not one of which has been attacked, while many others about them not thus protected have been afflicted. The horses like the medicine. Physicians, familiar with the qualities of borax, anticipate favorable results from the use of the new remedy.

THE HORSE DISEASE has become general all over the State, but San Francisco naturally suffers most. The disease is said to be in a milder form than when it raged in the Eastern States but its presence is nevertheless very detrimental to business of all kinds. Oxen have appeared in our streets in limited numbers and we have taken advantage to some extent of the central population of the city and utilized small gangs of chinamen to draw market wagons, etc.

BENTOLA CEMENT.—The Benicia Cement Company's works have changed hands, and the new company will make extensive improvements. A large bed of cement rock has been discovered not far distant from the works, which will supply a much larger mill than the one in operation, with rock for years to come.

BORAX.—A dispatch from Los Angeles says that over 150 acres of valuable borate deposits are now uncovered near Deert Springs Station. There are about 500 acres of good land in the district, all of which has been taken up.

The New Coal Land Law.

We give below the text of the bill in relation to the location of Coal Lands in the United States, which was passed by the last Congress. The Commissioner of the General Land Office will shortly issue needful rules and regulations for carrying the provisions of the law into effect.

[GENERAL NATURE—No. 107.]

AN ACT to provide for the sale of lands of the United States containing coal.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That any person above the age of twenty-one years, who is a citizen of the United States or who has declared his intention to become such, or any association of persons, severally qualified as above, shall, upon application to the register of the proper land-office, have the right to enter, by legal subdivisions, any quantity of vacant coal of the United States not otherwise appropriated or reserved land by competent authority, not exceeding one hundred and sixty acres to such individual person, or three hundred and twenty acres to such association, upon payment to the receiver of not less than ten dollars per acre for such lands, where the same shall be situated more than fifteen miles from any completed railroad, and not less than twenty dollars per acre for such lands as shall be within fifteen miles of such road.

Sec. 2. That any person or association of persons severally qualified as above, who have opened and improved, or shall hereafter open and improve, any coal mine or mines upon the public lands, and shall be in actual possession of the same, shall be entitled to a preference right of entry, under the foregoing provisions, of the mines so opened and improved: *Provided*, That when any association of not less than four persons, severally qualified as in section one of this act, shall have expended not less than five thousand dollars in working and improving any such mine or mines, such association shall be allowed for the filing of a declaratory statement, and no sale under the provisions of this act shall be allowed until the expiration of six months from the date thereof.

Sec. 3. That all claims under section two of this act must be presented to the register of the proper land-district within sixty days after the date of actual possession and the commencement of improvements on the land, by the filing of a declaratory statement therefor: *Provided*, That when the township plat is not on file at the date of such improvement, filing must be made within sixty days from the receipt of such plat at the district office: *And Provided further*, That where the improvements shall have been made prior to the expiration of three months from the passage of this act, sixty days from the expiration of said three months shall be allowed for the filing of a declaratory statement, and no sale under the provisions of this act shall be allowed until the expiration of six months from the date thereof.

Sec. 4. That this act shall be held to authorize only one entry by the same person or association of persons under its provisions; and no association of persons any member of which shall have taken the benefit of this act either as an individual or as a member of any other association, shall enter or hold any other lands under the provisions of this act; and no member of any association which shall have taken the benefit of this act shall enter or hold any other lands under its provisions, and all persons claiming under section two hereof shall be required to prove their respective rights and pay for the lands filed upon within one year from the time prescribed for filing their respective claims; and upon failure to file proper notice, or to pay for the land within the required period, the same shall be subject to entry by any other qualified applicant.

Sec. 5. That in case of conflicting claims upon the same lands, the improvements shall hereafter be commenced, priority of possession and improvement, followed by proper filing and continued good faith, shall determine the preference right to purchase. And also where improvements have already been made at the date of the passage of this act, division of the land claimed may be made by legal subdivisions, to be paid for as may be, the valuable improvements of the respective parties; and the Commissioner of the General Land-Office shall he, and is hereby authorized to issue all needful rules and regulations for carrying into effect the provisions of this act.

Sec. 6. That nothing in this act shall be construed to destroy or impair any right which may have attached prior to the passage, or to destroy the sale of lands valuable for mines of gold, silver, or copper.

Approved, March 3, 1873.

The New Diggings of Oroville.

A correspondent of the *Sacramento Record* writes as follows concerning the new discoveries at Oroville: Those who imagine the palmy days of placer diggings to have gone by in California, are, it appears, about to be disabused of the impression. There always has been a large class of Californians who have insisted that the rich discoveries are yet to be made. That the surface skimming has not uncovered the wealth of our buried river beds; and that the days of '49 will be revived, so far as gold washing is concerned. The faith of such men is commendable and we are almost ready to join with them when they insist that

"Pactolus runs in every mountain stream,
And every reed that rustles, whispers gold."

Desiring to present the latest and most reliable information concerning the rumored placer discoveries at Oroville, and anticipating a harmful "gold fever" from exaggerated and flying reports, the *Record* dispatched one of its corps to the new mining grounds on Saturday last.

The Recent Discoveries.

About a half mile east of the Feather River, and about two and one-half miles from Oroville, in Butte county, is the scene of the new diggings. A year ago a young man named Kline was led to locate a claim, and prospect, at a point near that named. He, it appears, struck it rich, but kept the matter a profound secret, probably under advice of his step-father, a resident merchant of Oroville and a shrewd man. By some means, however, the success of the boy became known to Mr. Gray, who holds a ranch hard by, and he began a series of explorations upon his own ground, resulting in his finding pay dirt. This was about one month ago. Gray at once offered his land in the region of the mine for sale in small parcels, or for rent.

John Chinaman.

The Chinese, ever on the alert, heard of the new grounds, and were soon on hand to buy and to lease. Gray has been kept busy ever since in making transfers and leases. For 200 feet square of ground he received at first \$100, but since then few know what he has sold for, but it is sure that he has pocketed up to this time some tens of thousands of dollars by his shrewd and business-like management. Outside of the Gray ranch hundreds of claims have been located, and scores sold to Chinamen, as John is prohibited from locating for himself.

The Exodus.

There are now fully eight hundred Chinamen and two hundred white men upon the grounds, and more are coming hourly. All the Chinamen have moved from the opposite side of the river to Oroville, and the greatest excitement prevails in the Celestial ranks. Everybody who can walk—for Epizooty has got horseflesh badly here—has gone, or is to go, out at once and locate claims. One day's work in ten is all that is required to hold a claim—200 feet being allowed per man. The people of Oroville have looked upon this excitement like others which have grown up here, and hence the new discoveries have been sneered at and laughed about. Now, however, when the gold begins to come from the gravel, the Orovillans open their eyes, and all the country is striving to reach the mines. Few white men thus far have done work; nearly all locating being made to sell out to Chinamen. But John is no fool, and he has an agent whom he can trust, and whom he consults in every case of offer or purchase.

The Mines.

Of course my examination, as yet, has not been thorough, but up to this date the following information can be relied upon: The region already prospected is about one and a half miles square, not more than one-eighth of this lies within the bounds of any patented ranch. The soil is a sandy loam; the surface of the earth perfectly level. Sinking from eight to ten and twelve feet, the prospector strikes a stratum of gravel about two feet thick; this yields nothing, but in nearly every instance he finds pay dirt just beneath it. The dirt has been proven in some cases eight, and in others ten feet in thickness or depth. Water is obtained by sinking some twelve to eighteen feet, and drawn up for work. All the washing is with pan and rocker, in the most primitive style. The gold is fine, scaly, river gold, and lies closely together. As high as twenty-five cents to the pan has been taken out, but the average seems to be six and eight cents. No capital is required to work these mines, as now handled, \$7 or \$8 suffices for a very good prospect. There are plenty of Chinese who will sink the prospect hole for what they can get out of the bottom.

An Opinion.

Opinions are very conflicting as to the mines. Some people declare it to be another "fever" and a humbug. These gentlemen give no reason for their faith. By far the greater part believe the mines to be genuine. Nay, they go further, and declare that all the indications point to greater discoveries to be made here than California has yet heard of; that the hills and ravines about Oroville hold vast stores of wealth soon to be opened to the public gaze.

George Grouser, who sets in all purchases as the agent of these Chinese, tells me these mines are no humbug; that he has sanctioned claim purchases thus far for over \$10,000. He to-day bought for his clients claims to the amount of

\$1,500. He believes the region extends all the way from Oroville Cemetery to Kent's farm, down the river and embraces a region over four miles in extent. There is no doubt in my mind but that these new diggings are upon the old bed of the Feather River, where it flowed ages ago. Every examination confirms this belief.

What They Make.

The boy who located the first claim, to-day sold it for \$910, and could have had more had he managed properly. A friend located a claim for a lawyer here, and that individual to-day turned the back of his hand against \$500, bid for ground where he never struck a pick or even kicked up a dust with his boot heel. Five Chinamen in four hours to-day worked forty buckets of earth yielding \$60, and were proceeding at the rate of 200 buckets per day. Forsyth brothers sold a claim of 200 feet for \$370.

Van Pelt & Co. refused \$1,200 for 600 located feet. A number of sales at \$100, \$300 and \$400 have been made. Some claims are held at exorbitant figures. One man declared to me that he could not be touched with \$20,000. A Chinese boss told me he cleared \$180 net with four Chinamen on Friday, and he showed the gold dust to prove it. Several Chinamen working singly show gold valued at from \$8 to \$10 as the result of a single day's labor. These cautious people are arriving here rapidly, and seem to be well supplied with money to invest in the diggings. White men singly at work admit they bring out from a half to a whole ounce as the result of a day's labor. In other parts of the field but \$1.50 and \$2 per day is realized.

Conclusion.

I conclude after my examination that these new diggings are not superficial; that in certain streaks the pay dirt is exceedingly rich.

Gang Subsoil Plows.

Herewith we present an illustration of Myers & Gummow's gang subsoil plow, an implement quite unique in form, and said to be admirably adapted to the purposes for which it was invented. The inventors and patentee of these plows, are practical, energetic and thorough mechanics, and fully understanding the real want of the agriculturist in this department, brought out this plow, for which they claim the following new and distinctive features:

FIRST—That the plows can be used as an ordinary two gang plow, or with one plow and the sub-soiler.

SECOND—If used in the latter manner, the sub-soiler follows in the previously made furrow—not behind the ordinary plow, and they claim a decided improvement in this, inasmuch as the off animal always walks in a hard furrow.

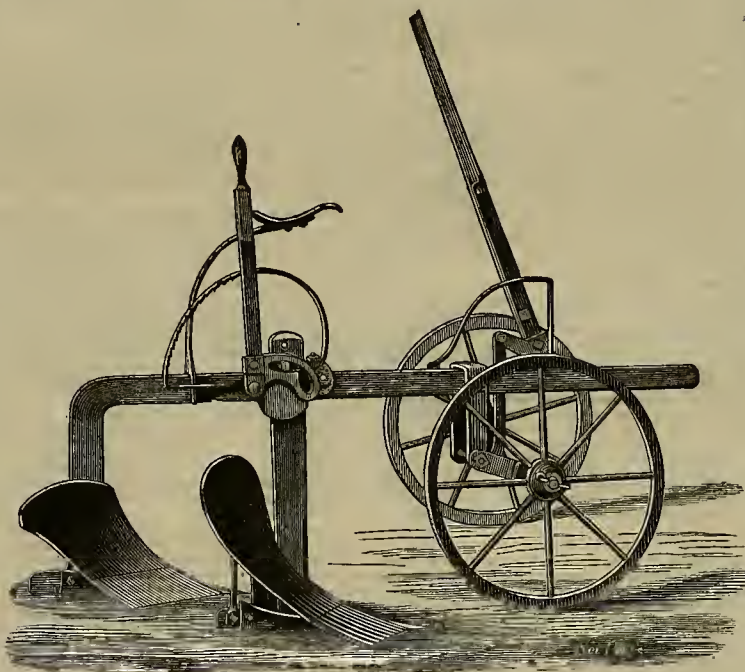
THIRD—They claim a decided improvement over any axletree now in use, in strength and ease of raising and lowering the plows.

FOURTH—These gangs are made of all iron, except the pole, and are consequently very strong and durable. They can be set so as to plow any desired depth to eighteen inches.

This plow was awarded two premiums at the State Agricultural Fair at Sacramento, Cal., in 1872, and one premium at each of the Fairs held at Marysville and at Chico, California, same year.

The Crown Point Mine.

The science of quartz mining has been carried to a very high point, says the *Alta*, in the



MYERS & GUMMOW'S GANG SUBSOIL PLOWS.

Proceeds have already been shown which prove this. Old and experienced miners assure me that the district is richer than many of the old and noted placers ever were, and as these men give evidence of their faith by their works, I believe them honest in their expressions.

People shouldn't come rushing here just yet. True, it doesn't cost much, and it wouldn't hurt Oroville to have an influx of people with money to spend; but the new diggings are experimental as yet, and while I am inclined to believe them valuable, it is altogether possible that, save in a few rich streaks, they will yield profit to Chinese labor only. Again, there are people enough here now to locate all the land between here and tide-water, and they are preparing to do it.

LOWER CALIFORNIA MINES.—The *Union's* correspondent at San Rafael, Lower California, says work is soon to be commenced on the old San Jacinto mine, which was discovered in 1850 and condemned under the Mexican laws. The present owners have 150 tons ready for crushing.

The quartz crushing works run by water power in San Rafael are about to shut down for want of water. The ten-stamp mill at St. Nicholas is running steadily.

QUARTZ.—Reports from the gold-quartz discoveries in northeastern Nye county, Nevada, continue very flattering. Specimens have been shown from the ledges, spangled all over with gold. They are owned by practical miners of limited means, the deepest shafts only being seventy or seventy-five feet deep.

COPPER.—The Humboldt, Nev., *Register* of April 19, says: We have been shown a specimen of the copper ore from a ledge recently discovered in a range of mountains north of Golconda. The specimen showed us weighed several pounds, and was fully one-third native copper.

cars, which hold about 1300 pounds each. These run immediately upon the cage, are lifted to the surface by steel ropes worked by steam, and unload themselves into vehicles that take the ore to the mills. The powerful machinery is worked unremittingly through the 24 hours, as it were pumping ore from the levels, incline and shaft, and discharging in upon the railroad race that feeds the ten or twelve remorseless mills which extract from it the last speck of bullion. By this means, as we have said, 600 tons of ore is daily drawn from the bowels of the earth and ground into pulp at the mills. Now, it will be observed, that the incline car, or Giraffe, holds 3 tons, consequently it must be filled and emptied 200 times in a day, and must 200 round trips from the bottom to the top of the incline, a distance of 850 feet. But 200 trips in 24 hours is one trip in 7 minutes. The car then must be loaded and unloaded and travel 1700 feet in 7 minutes, and, as we have said, it has done it in 5 minutes to raise 850 tons in a day. This gives an idea of the precision and power of the machinery. It will be borne in mind that where so much ore is taken out a vacant space remains. These spaces are, as fast as the ore goes, filled in solid with heavy timber, so that caving is impossible. There is also at the surface an enormous tank kept filled, with water, raised by the pumps from below. This water is conveyed in pipes to parts of the mine, where it is used with ice by the men, and may be promptly applied, with the hose always ready, to deluge any appearance of fire. All these gigantic automata, directed by Mr. Kellogg, one of the most experienced and able engineers, are applied to the extraction of a body of ore which has no parallel as yet. It has been followed through four levels, and two more are about to be opened. The quantity of ore which has been laid open will last four years at the present rate of working, and there is no doubt whatever of its indefinite continuance. The peculiarity of this ore body is that while all these found hitherto in the Comstock have been perpendicular to the foot wall, and ending with it, that in the Crown Point runs with the stratifications and improves in size and richness as it goes downward. The great and continued improvements in the self-acting machinery nearly obviate the inconvenience of deep working since the expense of a few hundred feet, more or less, is barely appreciable. The United States Consul General, at Mexico, reports the Guatimocin silver mine, which produced \$997,000 profits for the year 1870, at a value of \$5,000,000. The Crown Point earned \$2,100,000 in three months to April 1, and paid \$1,100,000 to the stockholders. This month of April it will earn nearly as much as did that Mexican mine for a year.

An Illinois Law Against Coal Miners' Strikes.

On the 19th of March the following bill passed the Illinois Legislature, and was signed by the Governor the following day:

A bill for an Act to amend an Act entitled "An Act to amend Chapter Thirty of the Revised Statutes, entitled 'Criminal Jurisprudence,'" approved February 13, 1863.

SECTION 1.—Be it enacted by the people of the State of Illinois, represented in the General Assembly, that an act entitled "An Act to Amend Chapter Thirty of the Revised Statutes entitled 'Criminal Jurisprudence,'" approved February 13, 1863, be and the same is hereby amended so as to read as follows:

SECTION 1.—If any person shall, by threat, intimidation or unlawful interference seek to prevent any other person from working, or from obtaining work at any lawful business, on any terms that he or she may see fit, such person so offending shall be deemed guilty of a misdemeanor, and on conviction thereof shall be fined in any sum not exceeding one hundred dollars.

SECTION 2.—If any two or more persons shall combine for the purpose of depriving the owner or possessor of property of its lawful use and management, or of preventing by threats, suggestions of danger, or any unlawful means, any person or persons from being employed by, or obtaining employment from, any such owner or possessor of property, on such terms as the parties concerned may agree upon, such persons so offending shall be deemed guilty of a misdemeanor, and on conviction thereof shall be fined in any sum not exceeding five hundred dollars, or imprisoned in the county jail not exceeding six months.

SECTION 3.—If any person shall enter the coal-banks of another without the expressed or implied consent of the owner or manager thereof, after notice that such entry is prohibited, such person shall, on conviction thereof, be fined in any sum not exceeding \$500, or imprisoned in the county jail not more than six months.

SECTION 4.—If any person shall enter the coal-banks of another with intent to commit injury thereto, or by threats, intimidations, or other unlawful proceedings, to cause any person employed therein to leave his employment, such person shall be deemed guilty of a misdemeanor, and on conviction thereof be fined in any sum not exceeding \$500, or imprisoned in the county jail not exceeding six months, or both.—*Iron Age*.

COAL.—Fifty years ago there were only a few hundred thousand tons of coal raised in Germany, where now 20,000,000 tons are mined as cheaply as in England before the price advanced.

USEFUL INFORMATION.

Manufacturing Industry in California.

The Federal census gives the following return of manufacturing industry in California:

	Annual product value.
Flouring and grist mill products.....	115 \$9,036,386
Blacksmithing.....	433 1,161,990
Boots and shoes.....	420 2,214,673
Bakery products.....	74 1,185,620
Carpentering and building.....	268 1,391,163
Carriages and wagons.....	84 1,309,443
Chromos and lithographs.....	108 1,090,270
Gas.....	10 1,856,783
Iron castings (not specified).....	27 1,139,841
Malt liquors.....	16 1,099,207
Vinous liquors.....	98 1,841,444
Lumber, planed.....	22 1,052,850
Lumber sawed.....	291 1,622,117
Machinery (not specified).....	29 1,737,710
Steam engines and boilers.....	17 3,904,043
Sugar refining.....	3 1,028,446
Newspaper printing and publishing.....	60 3,405,673
Milled quartz.....	114 1,027,680
Smelted quicksilver.....	4 1,063,452
Saddlery and harness.....	88 1,909,227
Tobacco and cigars.....	5 1,102,784
Woolen goods.....	

ECONOMY OF FUEL.—A correspondent in *The British Workman* tells how to build a fire as follows: The person laying a fire should fill the grate up to the top bar with coals, putting large pieces at the bottom and smaller over them, then upon these, paper enough to light the sticks, which should be laid upon, and not under, the coal. Cover the sticks with the cinders remaining from the previous day's fire; these will soon become red hot; the coal below will be warmed sufficiently to make it throw off gas; this passing through the hot cinders, will be kindled, and will burn with a bright flame, instead of going up the chimney in smoke, as it does when the coals are laid on the top.

The fire thus laid will require no poking, and will burn clear and bright for from six to eight hours without the necessity for more coals to be thrown on.

USES OF RAWHIDE.—The skin of an animal, whether cow, calf, colt, or horse, that dies on the farm is worth more at home than at the tanner's. Cut it into narrow strips, and shave off the hair with a sharp knife before the kitchen fire, or in your workshop, on stormy days and evenings. You may make them soft by rubbing. A rawhide halter-strap an inch wide, will hold a horse better, and last longer, than an inch rope. It is stronger than hoop-iron and more durable, and may be used to hoop dry casks and boxes, and for hinges.

Try it on a broken thill, or any wood-work that has been split. Put it on wet, and nail fast. Thin skins make the best bag-strings in the world. A rawhide rope is a good substitute for a chain. It is valuable to mend a broken link in a trace-chain. For some purposes it is best to use it in its natural state. For other purposes it may be dressed soft.

FOR SMOKERS.—Smokers of the royal weed are recommended to place in the bowls of their pipes a little powdered tannin, or a sponge saturated with tannin. The smoke will thus be deprived of its characteristic aroma and all the vaporized nicotine, which is the intoxicating principle. At first the smoke will be entirely free from all taste and smell of tobacco, but as the sponge becomes charged with the nicotine the odor will reappear. By charging the sponge frequently, the smoker may indulge in his habit as immoderately as he pleases without injurious effect.

IMPROVED TRACING PAPER.—Fischer of Nuremberg has lately suggested a solution of castor oil in absolute alcohol for the purpose of manufacturing a tracing paper. The oil is to be diluted with one, two or three times its bulk of alcohol, according to the thickness of the paper, and the amount consequently required for rendering it transparent. This can be laid on by means of a sponge; and in a very few minutes after the application the paper will be dry, transparent, and ready for use. It will readily receive the mark of a pencil or India ink, and as by immersion in absolute alcohol the oil can be removed, the paper can be restored to its original condition if desired.

IMPROVED DRAWING INK.—The addition of one part of carbolic acid to 80 parts of the fluid India ink, while it does not impair its fluidity, causes it to dry rapidly even in heavy lines, so that they can be varnished over. The proper amount of carbolic acid to be added in any case may be ascertained by adding drop by drop the ordinary apothecary's solution of it in alcohol until varnishing does not effect the definition of a test line by causing it to run. The addition of too much carbolic acid is indicated by the transparency of the line and the inability to draw fine lines, a condition easily remedied by the addition of more of the fluid ink.

CARBOLIC ACID may be deodorized by mixing it in a crystallized form with twice its weight of gum camphor, and adding whiting to the compound. In this form it is said to be valuable both as a disinfectant and as a protection to furs against moths.

GASES.—Of the 28 gaseous bodies known, 25 are reducible to liquid, and 9 to solids. When compression is required they all spring back to their original conditions with great rapidity and in many cases with destructive energy.

CULTIVATION OF GREEN OYSTERS.—The green oyster is highly esteemed by epicures, as being far more delicious in flavor than the white. Hitherto it has been supposed that the green color could not be produced outside of certain favored localities, the Marennes Basine, for instance, in France, sheltered bays in the Hebrides, and on the coast of Scotland, etc. This supposition proves to be incorrect, as according to M. Rochebrune, of the French revenue service, he has succeeded in growing green oysters at Arcachon, where they were never grown before. The details of the process by which M. Rochebrune obtained this result were reported to the Bordeaux Scientific Congress of last year, and will probably appear in the published accounts of its proceedings.

OPIMUM EATING AMONG ANIMALS.—The *Agricultural Gazette* of India is responsible for the assertion that, when animals have once learned to know the taste and properties of opium, they become as fond of it as human beings. In China, it is necessary to fence the poppy fields very carefully to keep out the cattle. Horses and cows that have become accustomed to being fed on poppies, sicken and die if deprived of them. Hogs fed on poppy-heads fatten quickly, but they must then be slaughtered. Bees prefer this to any other food, and rats come to opium factories to enjoy breathing the very dust of it.

PROFESSOR LIEBIG, writing on the effects of various stimulants, describes the red wine in some cases beneficial, or at all events the least hurtful; white wines generally are detrimental to the nervous system; sherry and strong cider intoxicate more rapidly than most wines, and have a peculiar influence on the gastric juice. Beer produces a heavy and dull intoxication, although the drinker of it is not apt to get thin. But the consumers of whiskey and brandy "are going to certain death."

AN ANTI-SWINDLING BALLOT-BOX.—An ingenious Bostonian has invented an anti-swindling ballot-box. By a mechanical contrivance, the number of times the box is opened for the reception of ballots is marked. This register shows at all times the whole number of votes deposited, and, as it records but one every time the box is opened, any attempt at stuffing is at once discovered.

GOOD HEALTH.

A New Mode of Treating Dyspepsia.

The Archives of Scientific and Practical Medicine, a new monthly edited by Dr. Brown Sequard and published by the Lippincotts, contains, among other very interesting articles, one in which the editor describes a novel mode of treatment which he first tried with perfect success in a very bad case of dyspepsia in 1851, and which has since been tested, with more or less satisfactory results, in many cases of dyspepsia. The following is an extract from the account of the first case:

"After a few days, finding that he had not improved, I decided to try a radical change of his alimentation, as regards the quantity of food to be taken at a time. Instead of three meals a day, I made him take sixty or more. Every twelve or fifteen minutes he took two or three mouthfuls of solid food, chiefly meat and bread. He drank a little less than a wineglass of Bordeaux wine and water every thirty or forty minutes. On the very first day this mode of alimentation was begun his digestive troubles disappeared, and within a week he was so well that he returned to Paris. He continued the same mode of alimentation for almost three weeks, and then gradually diminished the number of his homœopathic meals, and increased the amount taken at each of them, until in about eight or ten days he came to eat only three times a day, and a full meal at each time."

The following paragraphs will serve to give the reader a clearer idea of the treatment recommended:

"The plan consists in giving but very little of solid or fluid food or any kind of drink at a time, and giving these things at regular intervals of from ten to twenty or thirty minutes. All sorts of food may be taken in that way, but during the short period when such a trial is made, it is obvious that the fancies of the patients are to be laid aside, and that nourishing food, such as roasted or broiled meat, and especially beef, mutton, eggs, well baked bread, and milk, with butter and cheese, a very moderate quantity of vegetables and fruit ought to constitute the dietary of the patients we try to relieve. This plan should be pursued two or three weeks, after which the patient should gradually return to the ordinary system of eating three times a day."

The most varied diet as regards the kind of food can be followed under this plan as well as when one has only two or three meals a day. The only absolutely essential points are that the amount of food taken every 10, 15, 20, or 30 minutes be very small (from one to four mouthfuls), and that the quantity of solid food in a day be from 32 to 40 ounces, or a little less when, instead of water, the patient drinks beef tea or milk."

ANCIENT CHINESE SURGERY.—It has been proved by the Chinese medical records that 1,600 years ago the doctors of that country used anæsthetics to make patients insensible during serious surgical operations.

COLD BATHING.—Just now there is a reaction against daily cold bathing. A medical man cautions his patients against too frequent bathing, for fear the oil may be removed from the skin. He tells them that twice a month during the winter and twice a week during the summer are quite enough for anybody. A well-known writer has cautioned the world against the removal of the skin oil by too frequent bathing. This is an entire misapprehension. In hydropathic establishments the patients are sometimes bathed three or four times a day, yet never lose the oil of the skin in consequence. Purgatives, in preparing for the prize ring, are bathed two or three times a day and rubbed with rough towels by the strongest arms. Heenan was bathed three or four times a day, and was rubbed by McDonald and Cusick with all the power of their strong arms fifteen minutes at a time, and with the roughest towels and brushes, and yet the account says that when he appeared in the ring his skin was as beautiful as a baby's. If cold water were used without soap, a bath every hour, with the hardest friction, would only increase the secretion of oils.

LUXURY AND POISON.—From experiments made by eminent physicians in France, it is shown that the articles ordinarily made and sold there under the name of "ice cream," is mainly manufactured of corn-starch, French clay, and poisonous coloring matter. The beautiful carmine which pervades the treacherous compound comes from the cochineal bug. A continued course of such poison produces the most direful maladies. First, dyspepsia, then scrofulous eruptions, accompanied by a loosening of the teeth, and a dropping out of the hair. This agent of destruction is not confined to the street corners alone. It is sold as well in innumerable gilded saloons and places of fashionable resort.

MEDICAL VALUE OF ASPARAGUS.—A medical correspondent of an English journal says that the advantages of asparagus are not sufficiently estimated by those who suffer with rheumatism and gout. Slight cases of rheumatism are cured in a few days by feeding on this delicious esculent; and more chronic cases are much relieved, especially if the patient avoids all acids, whether in food or beverage. The Jerusalem artichoke has also a similar effect in relieving rheumatism. The heads may be eaten in the usual way, but tea made from the leaves of the stalk, and drank three or four times a day, is a certain remedy, though not equally agreeable.

LEMONADE IN FEVERS.—A cotemporary says that in most cases of fevers we have no doubt that an attack might have been prevented and the patient well in a few days without a particle of medicine, by rest, partial fasting and free use of lemons and lemonade. The virtue of this article in bilious attacks and incipient fevers has been tested with best results and we commend its use as a preventive of these diseases.

EFFECTS OF EATING BRAN.—The N. Y. Farmer's Club asked "what probable effect it would have if people should eat the phosphate of lime found in their wheat, instead of throwing the most of it away, as they now do in the bran?" Dr. Smith answered that two or three generations hence the men would be taller and the women would have better teeth—something worth considering."

MOSQUITO BARS AND MALARIA.—Writers of experience in nature, strongly recommend the use of the mosquito curtain in tropical regions, as a precaution against malaria. They "sift the air, and besides tend surprisingly to keep the temperature within them uniform."

UTILIZING OLD IRON.—The *Sacramento Record* says: It is well known that the more frequently old wrought iron is worked over the better it becomes. Acting upon this principle, all the axes with worn journals on the Central Pacific Railroad are now sent to the shops in this city, and by a blow of the trip hammer the ends are cut off. These ends are thrown into the scrap pile and are worked over as needed. The amputated axle is now upset and the ends beaten out to a shape like a hollowed hand. Into this hollow a fifty pound piece of fresh iron, at white heat, is welded and thoroughly worked upon the axle, which, being returned in the lathe, is found to be superior in all respects to completely new axes. Since this plan has been adopted over ten thousand journals have been thus treated. The rapidity and neatness of the process will repay a visit to the works to witness it.

ANOTHER GOOD WAY TO KEEP MEAT.—Cut in slices ready to broil or fry for the table. Then putting down in a jar one layer of meat, sprinkle with salt and pepper, and so continue till the jar is filled, cover closely and set in the coolest part of the cellar. It will keep a long time, for I and my neighbors have tried it.

CAUSE OF DEOXY IN EGGS.—U. Gayou has advanced the novel idea that the main cause of the decomposition of eggs is the presence of small organisms, which must have formed in the eggs while in the oviducts of the fowl.

THE MANSARD BONNET is declared a nuisance in the lecture room; and in some public halls a rule is adopted requiring ladies to leave their Mansard at home.

MISCELLANEOUS.

A GERMAN DOMESTIC INVENTION.—An ingenious culinary utensil has been devised by Mr. Huch, of Brunswick, Germany. The apparatus consists in a unique arrangement of a coffee-pot, which is set over a lamp or gas flame, and closed airtight by means of a cover, the rim or flange of the latter dipping down into water contained in a deep trough that is formed around the pot. The lid of the pot is connected with the regulator of the lamp, or gas flame. When steam is generated within the pot, the lid commences to rise, and acting upon the regulator, it causes the flame to be generated with sufficient rapidity to raise the lid higher. Mr. Huch constructs the pot with an inner vessel, fitting closely within it at the upper part, and this inner vessel has a perforated bottom covered with felt, flannel, or similar material, on which the coffee rests. A pipe descends through the perforated bottom of the pot. When the water in the pot boils, the pressure of the steam drives the water up the pipe into the upper vessel and over the coffee. The water then comes in contact with the lid, the lid floats; being thus lifted, by means of apparatus connected with it, it extinguishes the flame beneath. The steam in the lower part of the pot condenses as the pot becomes cooler, and the vacuum so formed causes the water to descend through the coffee, and the infusion is then ready to be drawn off for use.

DINING-ROOM INNOVATIONS.—An article in the *Paris Sport*, makes mention of two innovations upon the established routine of the dining-room proposed by epicures of that city. One party of these bon vivants is desirous of introducing anew the ancient custom of dining without tablecloth, as was done by the Greeks of old in Europe until the Middle Ages, when they first came into use under the name of doublets. They also suggest that the objects used on the table should be still more varied and elegant in the material workmanship than is now the case. There is another party of epicure who opposes this plan, and proposes in its stead an innovation in quite another direction. Their wish is not only to maintain the present usage of the table-cloth intact, but even to extend the fashion in the matter of napkins. The ground taken by them is, that the napkins should be changed for the different parts of the dinner, as is done with the plates, wine-glasses, and knives and forks.

MILK, TEA AND COFFEE.—Prof. Loomie thus speaks of milk, tea, and coffee. "Milk contains in solution not only a due proportion of carbon, hydrogen, oxygen and nitrogen, but all the other elements necessary for the construction of bone, nerve, etc., and hence is always a proper food in all circumstances of health. Tea derives its beneficial qualities not from its direct supply of nutrition, but from its affording a peculiar substance called theine, the effect of which in the system is to diminish the waste, thus making less food necessary. Tea thus has a positive economic value, not as a supplying but as a saving nutriment. Coffee, though of a taste so little allied to tea, derives its value in precisely the same manner and from nearly the same substance. Its value and effect in the system are therefore the same as those above stated. It is hence evident that milk, tea and coffee are valuable articles of food under all conditions of temperature."

A DANISH BAKER has invented a way to prepare a fresh, palatable and nutritious article of food in the form of cakes, containing two and one-half parts of bread to one of meat, and sufficient condiments, which it is claimed will resist the action of weather, and is excellently adapted for food for soldiers in the field or on the march. A large field of usefulness is before an invention of this kind, in utilizing the flesh of our Texan cattle and those of South America and elsewhere, which is now left to rot, or, as at Galveston and other Texas ports, is towed out into the Gulf after the hides are stripped off. Preventable sickness and premature mortality among the underfed populations of older communities might be largely reduced by the use of food now wasted.

CHEAP MOSQUITO BAR.—There is a cheap mosquito bar in vogue among the plantation hands and boatmen in some parts of the South which answers every purpose to the letter—it is common coal oil. A small quantity of oil is dropped upon a piece of cotton, and then squeezed out as dry as possible; after which the cotton is rubbed over the face and hands. No mosquito will alight where the scent has been left. I have tried it, and then exposed myself to clouds of them on various occasions without experiencing the least annoyance. Thousands of them would hover within an inch of my face, and sing by the hour, but none dare touch.—*Eutomologist*.

CHEESE.—According to the statement of Professor A. J. Bellows, there is more than twice the amount of food of any other known substance. It should therefore be used in small quantities and with articles containing little nitrogen, such as fruits and fine flour. Those persons whose occupations necessitate hard labor, and who cannot afford much fresh meat, will find in cheese a most wholesome nutritious food, less expensive and less likely to develop in the human system those scrofulous diseases attributed to animal food.



W. B. EWER.....SENIOR EDITOR

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Saturday Morning, May 3, 1873.
San Francisco:

Legal Tender Rates.—S. F., Thurs., May 1.—buying 86½; selling 87½.

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GRAND CONCERT.—For some time past the Handel and Haydn Society have been preparing to give a series of three nights of Grand Concert in this city. The well-known reputation of the society as possessing in its members the best talent of the city, caused the lovers of music to look anxiously forward to the time a rare treat. On the evening of Tuesday, 29th ult., the first of the series was given in the Tabernacle on Tyler street, to a house comfortably filled with the best class of our citizens. The music of the old masters was rendered well, and the hearty applause and frequent encores gave efficient evidence of a performance well-enjoyed by all lovers of the fine art.

GOLD SANDS.—It is stated that although reports were current that the expedition of the "Buhne" in search of gold sands on the northern coast, was unsuccessful, that it was not in fact an entire failure. A considerable quantity of sand was raised, which, according to the Humboldt Times, although taken from the top of the deposit, exhibited the color of gold. In examining a handful of it, there were discovered a dozen or more particles of gold. If such is the case no doubt they will try it again.

WHITE PINE is picking up again and there has been a great rush of miners thither from Pioche and adjacent districts. The mine are looking well and labor is in demand, everything indicating a prosperous season.

THE Virginia and Truckee Railroad is crowded with business. One day last week 28 trains aggregating 360 cars passed between Virginia and Carson.

COAL.—It is stated that a good article of coal has been found near the old Roslin smelting works at Eureka, Nev.

More about the Spectroscope and what It has Done.

Professor Neri delivered the last of his course of lectures on Spectrum Analysis on Thursday evening, the 24th ult. The attendance was large and the interest in the subject was well kept up. In opening the lecture the Professor remarked upon the great interest which has ever, from the earliest times, been felt in the heavenly bodies. This interest has grown greater from age to age, as the progress of science has unfolded to man more and more of the immensity of space, the nature of the orbs with which it is filled and the laws by which they are governed. Yet all that has been previously learned is but little in comparison to what the spectro-scope has revealed within the last few years.

The Professor proceeded to show how we know that the spectroscopes reveals the fact that the sun and stars are made up of elements identical with those which are found upon the earth, paused, awhile to consider the intense heat or temperature of the sun, and proceeded to show how it was more difficult to ascertain the physical and chemical constitutions of the stars than of the sun.

The stars are farther off—so far that even when viewed with the most powerful telescopes, they still appear but as mere points of light in the heavens. It is more difficult to catch, disperse and analyse such feeble rays of light as reach us from those distant orbs. But, under the patient and skillful study of such men as Miller, Huggings and Lockyer of England; Young and Rutherford of this country and Father Secchi of Italy, the spectroscopes has been made to do even this work satisfactorily. The methods by which this has been done was lucidly and distinctly shown.

The stars have been classified by Father Secchi, with regard to their spectra, into four divisions or types, viz:—yellow, white, red and variable stars—our sun belonging to the yellow type. The color of the stars, however, is not due to any especial difference in their composition; but to the fact that the light which they emit is more or less absorbed by their surrounding atmosphere or vapors.

In the yellow stars all but the yellow rays are more or less absorbed, so of the red, etc. The particular substances which thus absorb the rays of light are not as yet fully known. The spectroscope has already revealed to us the presence in the stars of so many substances found upon the earth, that there can be no doubt of a great similarity if not an absolute identity in composition of sun, earth and stars; and that the stars are in reality self luminous suns, like our own, but many of them of vastly greater proportions.

One of the most marvellous revelations of the spectroscope is the information which it gives with regard to the motions of the stars. That instrument tells whether they are receding or approaching us, (or we them). It also gives a very correct idea of the rate of such motion. The manner in which this is done was fully and

Most Clearly Explained.

Sound and light travel by the same means—waves; in space, light travels by waves of the interpenetrating ether, in our atmosphere sound travels by the waves of the air. If you are traveling on a train of cars, and another train is approaching, the sound of the whistle increases in its pitch rapidly, and becomes higher and higher as the trains approach—and the reverse as they recede.

This is because sound depends on a number of vibrations, and the greater the number the higher the note; hence by approaching the sounding whistle you meet many more sonorous waves than though you remained constantly at the same distance, and this greater number of impulses in a unit of time produces the impression of a higher note, which note is continually increasing in pitch, as the number of vibrations increase.

So with light. The spectroscope distinguishes between the number of waves required to produce a red color and those required for yellow, etc. It can count the waves of light by noticing the degree of refrangibility belonging to the various rays, or the colors which they produce, as we count the waves of sound by observing the notes produced on the musical scale. By closely watching the spectrum of a ray of light from a star, the lines will be seen to shift, perhaps from red to violet; then, as we know it requires a greater number of waves to produce the violet we rightly infer the object emitting the light is approaching us; and vice versa. So the shifting of the lines on the spectrum tells us whether the star is moving, and whether towards or from us, and almost its absolute velocity.

Rapid Motion of the Stars.

It is by this means that astronomers have been able to learn that some of the stars are moving at the almost incredible rate of 216,000 miles an hour—three times as fast as the earth moves in her annual revolution, and 280 times as fast as a cannon ball flies. The minimum being 35,200 miles an hour, and the maximum as about 216,000.

Of the Planets

The spectroscope tells us but little beyond

what we knew before; but it fully confirms our previous theories. They reflect horrowed light. Jupiter, Venus, Mars and Saturn give indications of having an atmosphere similar to our own. Mars is fully cooled down and the others at least proximately so—thus fitting them for the habitations of human beings like ourselves.

Nebula.

The most wonderful of the heavenly bodies are the nebulae, which look like little patches of mist or clouds in the heavens. They are innumerable in number and of immense extent. Some may be seen by the naked eye—as the milky way; but they are generally visible only by the aid of the telescopes. These bodies present most varied, and sometimes most remarkable appearances. A large number of the most remarkable ones were projected upon the screen. The spectroscope has resolved large numbers into clusters of stars—one little nebula, which occupies a surface not larger than one quarter of the moon's disk, consists of at least 200,000 stars, each star at an immense distance from any other.

Analogy teaches us of what the resolvable nebulae consist. But what of the unresolvable nebulae? The spectroscope has fully answered the question, and in five minutes solved a problem which has puzzled astronomers for 200 centuries!

That instrument shows that some of the unresolvable nebulae give a continuous spectrum with dark lines, whereby we know that such light emanates from an incandescent, self-luminous, solid or liquid body, not a mere vapor; but bodies similar to our sun. Hence we know that these nebulae really consist of clusters of stars, at immense distances.

Other nebulae show bright lines upon the spectrum, by which we learn that the matter of which they consist has not yet been aggregated or separated into stars; but consists simply of an immense mass of glowing, highly rarified vapor, in all probability undergoing the transformations which will eventually separate or reduce that vapor into separate stars or suns.

Comets.

The consideration of the subject of comets, with their tails was introduced with a very clever piece of pleasantry, comparing them to a certain class of comers, also with tails, who visit us from another celestial region. The telescope tells us but little about comets, but the spectroscope has already revealed much, and will probably add much more in the future; as but little opportunity has been afforded astronomers to study this class of heavenly bodies since the spectroscope has been brought to its present state of perfection.

Comets show an intermittent, not a continuous spectrum. They are self-luminous, gaseous, highly rarified, and give but a very faint spectrum. They are so attenuated, that some which make a great show of body and tail, if condensed into solids might be stowed away in a gentleman's traveling bag. But little danger need be apprehended from them. They have collided and swept over the earth already, without our knowledge, until they had passed. Several of the most remarkable comets which have appeared were beautifully shown upon the screen. Their spectrum shows the presence of carbon and hydrogen—and probably consists of something similar to hydrocarbon vapor, or common illuminating gas.

The Professor remarked that the component matter of comets was so extremely attenuated that it was thought by some that the substance of which they are composed was perhaps divided into or never yet coalesced from their original conditions of independent atoms.

Sun Spots.

The Professor next called attention to those remarkable appearances upon our luminary, called sun-spots. They are simply gigantic cavities in the luminous and heated atmosphere of the sun, produced by currents of air in storms, similar to those in our own atmosphere. They are circular or nearly so, because the air currents in storms on the sun as well as on the earth move in circles.

These cavities are often of immense size and depth, often so large that the earth might be swallowed up in one as easily as a man can swallow a sugar-coated pill.

The atmosphere embraced within these huge sun storms, becomes, by the uprush away from the heated nucleus, slightly cooled, in comparison with the surrounding undisturbed atmosphere, and thus looks dark, in comparison merely, just as even a bright artificial light looks dark and even black when projected upon the sun's disk. The appearance which these spots present when viewed through a telescope were beautifully portrayed upon the screen; also a large number of so called protuberances and explosions, of which so much has been said and written during the past few years.

The professor closed his lecture and the series, with some eloquent and appropriate remarks upon the elevating and ennobling influence resulting from the study of science in general. He thanked his audience for their kind and patient attention through the lengthened sessions of the course; those of his pupils who had so kindly and efficiently assisted him in his experiments and illustrations, and expressed the hope that he might, at some future time, deliver another course, which might have a more practical value.

Although no formal expression was made, as there might and should have been, we feel well assured that every one of the large audience felt to acknowledge their heartiest thanks for the rich and rare intellectual treat which had been placed before them on each and every eve-

ning during the course; and we doubt not that the announcement of another course would be most enthusiastically received by the public of San Francisco, who are just now beginning to be fully alive to the importance of encouraging every reasonable means of popular, scientific instruction.

An Important Mining Decision.

Another notorious scheme prejudicial to miners, has been defeated by the righteous decision of the Secretary of the Interior in the Keystone mine case. The decision is one that will give universal satisfaction among the mining community, as it affects all the Western States and Territories as well as California. The claim was one gotten up by sharp speculators to obtain possession of the Keystone mine, and involved the question, of wide application, as to whether the grant to the State of California of the sixteenth and thirty-sixth sections for school purposes, under the Act of March 3d, 1853, included said sections when they were on mineral lands. This case has naturally excited much attention as the principle sought to be established by the claimants was a dangerous one to all parties holding claims on the sixteenth and thirty-second sections in all the mineral States and Territories. These claimants endeavored under the name of the State to obtain possession of valuable property by a mere legal technicality. The details of the case were given in our issue of April 19. In the decision Secretary Delano holds:

"First.—That title to said sections sixteen and thirty-sixth does not vest in the State until a survey has been made, which brings into existence and locates said sections, and that said mining companies having appropriated said lands under the Act of July 26th, 1866, prior to such survey, they had the better right."

"Second.—That the seventh section of the Act of 1853, excepts from the grant all of sections sixteen and thirty-six on which there had been prior to the survey, a settlement, by the erection of a dwelling-house, or the cultivation of any portion of the land, and that the settlement referred to was technically known as the pre-emption settlement." This point seems to protect settlers on these government lands from any sharp practices as in the case in question.

"Third.—That the grant was not intended to include, and does not include said sections when they are on mineral lands."

This last point knocked the bottom out of the job put up by the claimants of the Keystone mine, and establishes a principle which will effectually protect honest miners hereafter from the schemes of wily speculators, who want to profit by the work done by miners in good faith, by means of a mere legal technicality. All these points are adverse to the parties endeavoring to get possession of the mine and town site of Amador, and it is with satisfaction that we record this result.

There has been great pressure brought to bear on the Secretary of the Interior in this case according to current reports, and a great array of legal talent was employed to push the matter through. Mr. Sargent took sides with the miners and filed an argument with the Secretary holding that the lands should not go to the State as school lands which the Secretary's decision confirms. The decision of the Secretary was voluminous and interesting, according to a dispatch from Washington to the Call. He assumes in the outset that in every valid grant there must be a grantor capable of making a grant, and a grantee capable of taking it, and a thing granted capable of identification with reasonable certainty; also, that all grants by the General Government must be construed strictly against the grantee, that nothing passes by implication, and that the intent of the law makers, as gathered from the entire law, must govern. He rules that title to sixteenth and thirty-sixth sections vest in a State only after a survey; that prior to the survey the grant is in the nature of a float; until a survey has been made there are no tracts answering the call of the grant. Congress meantime may legally provide that lands shall never be surveyed, or in some other way provide that there shall never be sections 16 and 36. The school grants are similar to railroad grants, and the Supreme Court has repeatedly held that no title to specific sections vests until the railroad line be definitely fixed. Secretary Delano cites a Michigan case wherein the Supreme Court expressly recognized the power of Congress, by subsequent legislation, to interpose a legal impediment to title of school sections resting in the State upon survey. Other cases are cited tending in the same direction. He further holds that the seventh section of the act of 1853 excepts from the grant to the State, lands upon sections 16 and 36 upon which any settlements, by the erection of buildings or cultivation of any portion of the lands, has been made previous to the survey. He holds also that school grants include no mineral lands, presenting abundant conclusive evidence sustaining his position. If in error, he adds, the State has an easy method of presenting the question for a Supreme Court decision; while if he should decide in favor of the State, and be in error, there is no way in many cases whereby the error could be corrected.

Frazer River Idols.

All tribes of Indians have their peculiar customs with reference to disposing of their dead. Some bury them, some burn them, some smoke them, and others place them in hammocks raised from the ground. But whatever disposition is made of the bodies, the location of the remains is, as with civilized nations, more or less consecrated ground. The accompanying engraving shows one of the cemeteries of the Frazer River Indians. It is from a sketch made by Geo. H. Burgess, who visited that country during the "Frazer River excitement" in 1858. A few places of this character are found in that region, but this particular one possesses the same general characteristics as the others, and is moreover somewhat more extensive.

The spot is above the town of Fort Yale on the Frazer River in British Columbia, at the foot of a tremendous precipice about 2,000 feet high. The situation is a most romantic one, just below the entrance to "the Cañons" on the river, where the scenery is described as grand in the extreme. The square boxes in the back ground contain the remains of defunct Indians, piled one upon the other, and enclosed by a rude shed for protection from the weather.

the engraving, done in a rude manner and with imperfect tools. All the idols are painted in bright colors after Indian fashion. What the Indians suppose them to represent we have no idea. The different idols may be commemorative of some famous Indian, skilled in the arts of war or the chase, or they may be placed there as imaginary guardians of the dead to protect the remains of those who have gone to the "Happy Hunting Grounds." At all events the images are held in great respect by the Indians who inhabit that part of the country.

The Alta as a Scientist—the Late Lectures on Spectrum Analysis.

It is to be regretted, just as a growing interest is beginning to be manifested in this community, in favor of popular scientific lectures, that any journal should attempt to deprecate and discourage efforts having the furtherance of that object in view; and it is quite inexplicable that such a journal as the *Alta* should indulge in disparaging criticisms on such an eminently superior course of lectures as that recently given by Father Neri, at St. Ignatius College. In reference to these lectures the *Alta* of the 25th ult. said: "Father Neri delivered the last of his course of five lectures, on the 'Spectroscope,' last evening. The first was on the general principles of chemical

the new method of spectrum analysis, compared with the other systems generally employed. The lecturer explained the origin or starting point of the new method; the conditions requisite for its application to all substances, and the ease, delicacy and exactness of this analysis, showing that it was far superior to what is attained either by the dry or humid analytical processes of chemistry. He gave also an historical sketch of the rise of spectral analysis, with a mention of the scientists from whom it originated.

The second lecture was "On the prismatic analysis of light"—the work performed by the spectroscopist. This lecture involved the nature of the spectrum from luminous sources, and the composition and decomposition of light. The nature, sources, propagation, reflection and refraction of light were explained and illustrated, as the main principles on which all the working of the new analytical instrument—the spectroscopist—entirely depends.

The third lecture was "On the construction of chemical spectroscopes, and the results of their actual examination of all terrestrial substances." It introduced the application of the spectroscopist to the analysis of the alkalies and alkaline earths, the heavy and the noble metals and the gases. Its application to other sciences—geology, mineralogy, physiology, anatomy, etc.; to the industrial arts; technological researches; medico-legal investigation; microscopical studies, etc., were also shown. Absorp-

jects, it was simply bad for him, not for those who could comprehend the subject.

As to whether "all the lectures were too long," and "many persons tired out" with listening to them—the constantly increasing interest and enlarged attendance at each succeeding lecture, to say nothing of the special and unanimous demonstration made by the audience, on one occasion, when the lecturer proposed to cut short the most lengthy session of the series, will speak for themselves, and fully attest to the fact that the listeners were too well pleased to take the least note of time.

If "much of the material is to be found in the commonest text books" it was because the lecturer was compelled to use it in order to elucidate and show the great progress which has been made by the spectroscopist since the last "text books" have been prepared—and this the lecturer did, bringing the progress of science in this direction down to the very latest day.

The fact is this has been the most thorough and complete course of scientific lectures ever delivered in this city. It was not given for a mere pecuniary compensation, as the expenses of each lecture amounted to quite as much as the total amount realized from the nominal fee



BURIAL PLACE AND IDOLS OF THE FRAZER RIVER INDIANS.

The dead Indians are placed in these painted boxes with their clothes, blankets, etc., and about the boxes containing the remains are hung the personal effects and utensils of the deceased. On the top of the shed on the left will be noticed an old broken canoe, the property of some departed aborigine. The figures of animals which are carved in bass-relief, represent bears, otters and beavers. The central figures are an Indian and squaw, the man wearing a mask such as the Indians use on some of their festive occasions. The figure kneeling down is carved out of a solid piece of wood, and the gun in its hand has an iron barrel, taken from an old musket. This figure bears evidence of being made at some recent date after the advent of white people to the river, since it is represented as wearing a *bona-fide* beaver hat. The figure half seen behind the large idol on the left, is ornamented in the same manner.

All these figures are carved from wood and painted in a rude way. The Indians worship them after their manner and occasionally wandering parties come to the locality, place themselves in front of the idols and weep and wail after the fashion of California Indians at a burial. They respect the idols very much, and protect them from damage as much as possible. On one occasion a white man mutilated one of the images by firing a rifle ball into it, and an Indian who witnessed him followed and dogged his footsteps for some days, until he found an opportunity to kill him, which he did. The Indians who travel near these places will go out of their way to visit them on all occasions. The carving is, as will be seen by

an analysis; the second on the optics; the last on the spots, corona and elipsis of the sun. The third and fourth were mainly on the spectroscopist; in the others that instrument was brought in only incidentally. All the lectures were too long—sometimes reaching to 11 o'clock, so that many persons were tired out. Much of the material is to be found in the commonest text books, and although instructive to many, was tiresome to those prepared for a lecture on the spectroscopist.

All the information given in this course was highly proper for public lectures, but they would have been more satisfactory if each had been given under a title giving a true idea of the subject."

No intelligent reader who had the pleasure of listening to Prof. Neri, can fail to remark the utter lack of knowledge in the subject matter of the lectures, which the *Alta's* critic displays in the above paragraph. The subject of the first lecture was not at all as stated, neither was the second based upon the meaningless phrase—"On the Optics;" nor was the last "On the spots, corona and elipsis of the Sun." For the double purpose of giving our readers a brief reamé of the subject matter of these lectures, and to show how much thereof the critic of the *Alta* could have heard or understood, we append the following brief synopsis or plan of the course:—

The first lecture was "On the advantages of

spectra were explained, also phosphorescent and fluorescent spectra.

The fourth lecture explained "The principles upon which the spectroscopist grounds its achievements in the heavenly regions—the foundations of solar and stellar chemistry—how it proves the existence of certain substances in the sun,—selective absorption, dark solar lines and their coincidences with our bright metallic bands." The physical spectroscopist—instruments of great dispersive powers, etc., were the principal themes of the explanations, illustrations and experiments of this lecture.

The fifth and last lecture of the series, a report of which will be found in another column, was "On the revelations of the spectroscopist from its investigation of the celestial bodies." It applied the principles previously explained to the discovery of the composition and constitution of the sun, the stars, the nebulae, the comets and meteors. It gave the explanation which the spectroscopist furnishes of the most difficult, puzzling and ancient astronomical questions—of the sun's daily meteorology, its spots, faculae, prominences, etc., and the nature of its corona during total eclipses, mentioning the wonderful work and construction of the tele-spectroscope, and the almost incredible strides made with it in astronomy.

From the above, the reader will be able to judge whether the spectroscopist was actually made, as professed, the real subject of the course, or whether it "was brought in only incidentally."

It will also be observed whether the lectures were strictly connected and followed in due and natural sequence. If the *Alta's* critic did not or could not see aught but detached ab-

charged for admission—to say nothing of the work of preparation.

CHEMICAL LABELS.—Mr. Henry G. Hanks, No. 649 Clay street, has issued a little pamphlet of chemical labels, arranged so that the labels may be cut out and used to make known the contents of the bottles upon which they are placed. The labels are arranged alphabetically and numerically and comprise the names of all the reagents used in analysis, both qualitative and quantitative, and also those used with the blowpipe. They are printed in plain neat letters of a convenient size and will be found of great convenience in the laboratory, assay office and similar places. The little book will be sent free on application.

MINING SUIT.—A. D. Daunes has brought suit against the Riveride Mining Company, in Tuolumne county, to compel the transfer of 235 shares of stock on the company's books in the name of Donald Davidson, which were sold at Sheriff's sale to satisfy a judgment against Davidson obtained by one Edward Heskner and by him assigned to the plaintiff.

COIN.—There was \$106,000 in gold coin and \$153,510 in fine silver sent to New York by rail during the past week. During the past twelve weeks, \$3,765,100 in gold coin has been sent to New York by rail.

THE BRISTOL FURNACE went into operation last week on ore from the National lode.

Siemens' Regenerative Gas Furnace With Peat as Fuel.

Action has recently been taken by the Council of the Royal Dublin Society on the important question of the utilization of peat in the manufactures. Professor Reynolds suggests the use of a mode of employing peat as fuel for industrial purposes, which according to Iron, appears to have been either overlooked or entirely neglected. In his opinion the successful and economical use of peat in manufactures is more likely to depend on the proper adjustment of the furnace to the fuel, than of the fuel to the furnace, the costly preparation of peat being open to many serious objections.

In 1862 the venerable Professor Faraday delivered his last lecture at the Royal Institution of Great Britain, and took for his subject "Siemens' Regenerative Gas Furnace." At the time Professor Reynolds was very much impressed by the admirable apparatus described, in consequence of the facilities it afforded for the combustion of any such bulky fuel as peat. Since 1862 Mr. Siemens has taken out no less than eighteen patents for improvements in his apparatus, and it now appears to be exceedingly well adapted for peat burning. In the regenerative gas furnace, the fuel is very simply converted into combustible gas in a separate chamber of peculiar construction; the gases are then conducted into the furnace containing the material to be heated, and are then burnt with hot air. After use, the intensely heated products of combustion are made to pass through brick chambers called "regulators," and the heat which would otherwise be wasted is caught, stored up in the bricks, and subsequently made to raise to a very high temperature the air, etc., required to supply the furnace. In addition to the economy of heat resulting from the use of this apparatus, two special and most important advantages are gained. In the first place a bulky fuel like peat, containing a large proportion of worthless and often injurious ash, can now be easily and successfully employed in several important manufactures, since it is no longer necessary to bring the solid fuel into direct contact with the material to be heated. Secondly, the use of a very dry fuel is not required, owing to a peculiarity in the mode of working the furnaces. Siemens' apparatus is therefore specially suitable for the combustion of rough and simply air-dried peat.

Mr. Siemens states that his opinion perfectly agrees with that of Professor Reynolds. "I have used peat abroad for working glass furnaces, and I have employed it with complete success for making steel in England; indeed the men gave the preference to peat over Staffordshire coal in working the regenerative gas furnaces. In England, coal is, of course, the cheapest fuel; but I am convinced that through the application of peat, as Professor Reynolds suggests, several branches of industry may be planted with great advantage in Ireland. Regarding the heating value of peat as compared with coal, it can be arrived at for my purpose by simply ascertaining the relative percentage of solid carbon in both. The water (if not in excess) may be regarded merely as a deduction, without injury to the heating value of the solid constituents. The vapor of water mixed with the gas is all condensed in the cooling tubes of my apparatus before reaching the furnace.

The Royal Dublin Society have received from a committee which they appointed at the instance of Prof. Reynolds the report appended below. The evidence given to the committee and the result of their own inquiries have led them to the following conclusions, viz.:

1. That Siemens' Regenerative Gas Furnace is eminently adapted to a very large number of manufacturing purposes; in fact to most in which a very high temperature is required, and in which the work to be done permits the furnace to be entirely closed. It was given in evidence that it has been successfully applied to the production of iron and steel direct from the ore, to glass works, potteries, zinc works, forging on the largest scale, and many branches of manufacture.

2d. That rough air-dried peat, containing on the average 25 per cent of water, is suitable fuel in a Siemens' furnace.

3d. That peat, when burned in this furnace, compares more favorably with coal, as regards heating power, than when used in any other known way. It has been stated to the committee that with ordinary appliances the general heating power of $2\frac{1}{2}$ tons of average peat is about equivalent in practice to one ton of average coal.

On the other hand, the proportion in Siemens' furnace appears to be much more in favor of peat, and to assign a value to peat not less than 65 per cent. of the value of Staffordshire coal.

The committee have not been able to ascertain the heating value of coal refuse, which is also a fuel employed in Siemens' furnaces, so that the committee are unable to state the proportion of value between peat and such fuel. The committee has been informed by Mr. Siemens' that peat mixed with about 25 per cent. of coal-dust gives a richer gas than peat alone.

The extent of hog which is available appears to be immense, and the bogs are so distributed over Ireland that they must, in many cases, be in the immediate neighborhood of the places where manufactures may be expected to arise.

In such cases the gas-producing apparatus might be situated at the bog, and the gas conveyed to the factory by culverts. The facilities of transport are likewise very considerable. The Midland Great-Western Railway Company alone have lines running through seventy miles of bog, and it is well-known that the Royal and Grand Canals pass through the bog of Allen—the most extensive in Ireland. Peat is at present delivered into the canal boats at 7s. per ton. This corresponds to a price of about 12s. for large quantities in Dublin. The application of machinery, the committee are led to believe, would greatly reduce the cost of cutting and saving turf.

Two Siemens' regenerative gas furnaces have been constructed at the works of the Great Southern and Western Railway, at Inchicore, with a view to the employment of peat. These will afford an opportunity of more fully testing the value of this mode of using the chief fuel of Ireland.

MINING IN NEVADA COUNTY.—The following information is from the Nevada Transcript: The impression now prevails that the present season, which appeared so excellent for hydraulic mining a few months ago will be two months shorter than the run of last year in those localities, where they only have water part of the year. Though much snow fell, there was no rain to pack it. It was very light and melted rapidly, so that little now remains to depend upon for a long supply. At some points in the county the supply is already failing. The Manzanita hydraulic claims located on Bourbon Hill, are now running 1,000 inches of water, and washing off a large amount of ground through the old flume, while the bed-rock tunnel is being run to strike the gravel at the bank 47 feet below the surface. This tunnel was commenced in 1867, and it is to be 2,600 feet in length. When Roberts & Co. bought in they had 1,595 feet still to run. On Saturday last they made the connection between shafts 4 and 5 at the face of the bank, striking it as true as though the entire work had been above ground. They have now only 294 feet to run to complete the tunnel, and this they are working out from six faces.

NARROW-GAUGE TO MARYSVILLE.—The Nevada Transcript, of April 22d, has the following: "We learn from a gentleman who has just returned from San Francisco that the project of building a narrow-gauge railroad from this city to Marysville will be revived again. William W. Magary, the gentleman who visited this city a few months ago to see how our people felt on the subject, and went away perfectly satisfied with the encouragement he received, will be here in the course of two weeks in company with other parties connected with the road. They say they mean business, and will bring the books with them for the purpose of giving our citizens an opportunity to subscribe for stock. The company is already incorporated under the name of the California Central Narrow-Gauge Railroad Company.

DIAMONDS.—According to official documents published by the English Colonial office, the value of the Cape diamonds which left the colony last year is estimated at not less than \$10,000,000. The supply is very far from being exhausted, and for many years finer gems than any that have yet been discovered may be expected from that country. The mineral resources of the interior of South Africa seem well-nigh boundless. Several hundred diggers have already made their way to the newly discovered gold fields of Marabastad, in the South African Republic, about 350 miles beyond Klipdrift, where the indications are said to be of a more promising character than at the remote Tatin quartz reef on the Limpopo River.

A SWIFT TYPE-SETTER.—Edmund C. Hubbell, of whose remarkable feat of type-setting mention has been made in the papers, undoubtedly stands unrivaled. A week or so ago he accomplished the feat of composing in ten hours time 15,290 ems solid brevier, and in one single hour composed 1,960 ems. On April 5th he composed in ten hours working time 16,005 ems, and in two hours set up 3,982 ems. The type used was minion and brevier. This gentleman has not yet attained his majority, but he bids fair to soon surpass the noted George Ahrensberg.

A PRIZE.—The Council of the British Society of Arts have resolved to offer the gold medal of the Society to the manufacturer who shall produce and send to the London International Exhibition of 1873, the best collection of specimens of steel, suitable for general engineering purposes. The specimens exhibited must include a complete illustration of the applications of the varieties of the steel submitted.

TROUT.—The California Acclimatizing Society have hatched about 250,000 trout this year at their ponds, near San Pedro. From 120,000 eggs about 90,000 came to maturity. The patent-hatching boxes with charcoal sides are used.

COAL IN CHINA.—The backwardness of China is indicated strikingly by the simple fact that, although her coal-fields cover 400,000 square miles, she mines no coal, and although she has an inexhaustible supply of iron ore, she smelts very little.

Twenty thousand coal miners in Leicestershire have struck.

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well-constructed model is generally first needed, if the invention can well be thus illustrated. It must not exceed 12 inches in length or height. When practicable, a smaller model is even more desirable. Paint or engrave the name of the article, and the name of the inventor, and his address upon it.

Send the model (by express or other reliable conveyance), plainly addressed, to "DEWEY & CO., MINING AND SCIENTIFIC PRESS OFFICE, SAN FRANCISCO." At the same time, send a full description, embodying all the ideas and claims of the inventor respecting the improvement describing the various parts and their operations.

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As soon as signed and returned to us with the fees then due us, it will be sent straightway to the Patent Office at Washington.

When the invention consists of a new article of manufacture, a medicine, or a new composition, samples of the separated ingredients, sufficient to make the experiment (unless they are of a common and well-known character), and also of the manufactured article itself, must be furnished, with full description of the entire preparation.

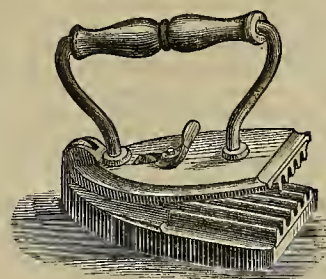
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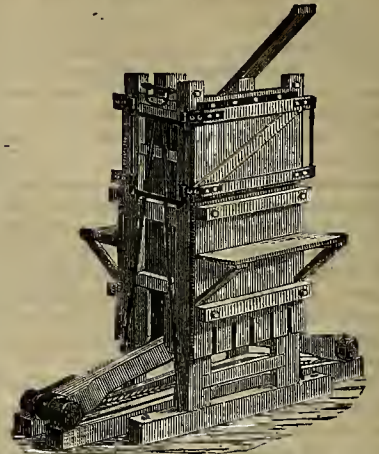
This new invention takes the place of two articles needed in nearly every house. As a POLISHING IRON it has no superior. The part used for fluting is made of brass, and highly polished. A receipt for making FRENCH GLOSSING STARCH, that gives a superior polish, goes with each iron. The Polishing Iron and Fluter, being in one, are both heated at the same time. We are now prepared to furnish them in quantities to suit. Price, \$3.

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All who have seen or used these presses pronounce them superior to anything used heretofore. The power is applied by means of two levers, and it will be seen the power increases in ratio to the resistance, as the levers approach a horizontal position the power can scarcely be estimated. It is not only a powerful press, but has the advantage of being cheap, and also simple, therefore not liable to get out of order.

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We have added to this Press this season an improvement (patented) which does the stamping, dispensing with men to tread down the hay in the Press, facilitating the operation, and saving much hard work. The additional cost being but \$25, paying for itself in labor saved in a week.

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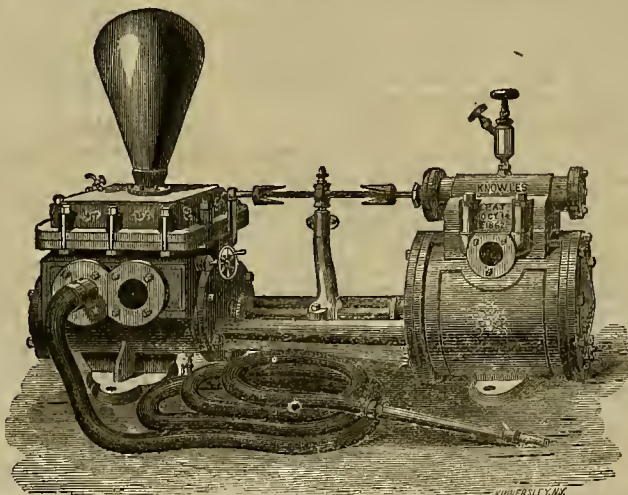
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They are constructed so as to apply steam directly
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The pan being filled, the motion of the muller forces
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Thence it is thrown to the periphery into the quicksilver.
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Settlers made on the same principle excel all others.
They bring the pulp so constantly and perfectly in con-
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PATENTS & INVENTIONS.

Telegraphic List of U. S. Patents Issued to Pacific Coast Inventors.

[REPORTED OFFICIALLY FOR THE MINING AND SCIENTIFIC PRESS, DEWEY & CO., PUBLISHERS AND U. S. AND FOREIGN PATENT AGENTS.]

By Special Dispatch, Dated Washington, D. C., April 29th, 1873.

FOR WEEK ENDING APRIL 15th, 1873.*

HYDRO-DYNAMIC STEAM ENGINE.—Wm. Burnett, San Francisco, Cal.

MUSEUM LEAF TURNER.—Anthony Rosenfield, assignor to self and Henry Polley, San Francisco, Cal.

CONSTRUCTION OF HOUSES.—David L. Emerson, Oakland, Cal.

ANIMAL CAVE TRAP.—Sylvester W. Rice, Roseburg, Oregon.

WOOD PAVEMENT.—Henry M. Stow, San Francisco, Cal.

RE-ISSUE.

WIND MILL.—Wm. J. Tustin, San Francisco, Cal.

*The patents are not ready for delivery by the Patent Office until some 14 days after the date of issue. Note.—Copies of U. S. and Foreign Patents furnished by DEWEY & CO., in the shortest time possible (by telegraph or otherwise) at the lowest rates. All patent business for Pacific coast inventors transacted with greater security and in much less time than by any other agency.

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co., Scientific Press American and Foreign Patent Agency, the following are worthy of mention:

PREVENTING INCRUSTATION OF BOILERS, TUYERES, ETC.—R. A. Fisher, San Francisco, Cal. Mr. Fisher has discovered a simple, cheap and effective remedy for the incrustation of boilers, tuyeres, etc. His invention has been thoroughly tested and proven, and we doubt not will save many a dollar which is now expended and lost in replacing and repairing leaky tuyeres in our smelting furnaces.

MACHINE FOR CUTTING VENEERS.—E. S. Gilmore, San Francisco, Cal. This invention relates to a device for feeding blocks of wood to the knife of a veneer cutting machine by which the block will be automatically moved up against the knife, after each slice is cut and thus he in position to receive the knife when it again descends. A weighted rod is suspended so that its lower end bears against the block opposite the blade. The weight causes the rod to continually exert a pressure against the block and as each veneer is cut the block is moved forward against a gauge plate on the knife frame, which can be set so as to gauge the thickness of the veneer as desired.

FILTER.—Prosser Huerne, S. F., Cal.—This patent is for a filter which is intended more particularly for house use, in place of the ordinary water cock or faucet. Mr. Huerne makes a globular or oval shell inside of which he secures a round or oval filtering stone. The stone is somewhat smaller than the interior of the shell so that a space is left entirely around it. The pipe which receives the filtered water passes through the case and into the center of the stone while the unfiltered water is delivered by a pipe into the space surrounding the stone. The pressure in the filter causes the water to pass through the stone to its center, where it is received by the interior pipe and from which it can be drawn. The large area which Mr. Huerne obtains by using the round or oval stone in the above described manner renders the filter quite effective as the larger the filtering area the greater the quantity of water it is capable of filtering. The filter can be reversed when it is desired to clean it so that the water is delivered to the interior of the stone and filters outward into the surrounding space, thus effectually cleaning the stone so that it filters freely again.

SAW SWAGE.—Alfred J. Hinde and James S. Howe, of Santa Cruz, Cal. These inventors claim a saw swage made partly of wood and partly of metal. The two substances are so combined that while the metal portion serves as a bearing for the point of the tooth which is being swaged the wood rests upon the edge of the saw blade, thus preventing the saw blade from being marred, as is often the case when a metal swage is used. The form of the swage is also claimed, as it is better adapted to fit between the teeth and plate.

ANTI-FRICTION METAL.—Geo. S. Hunt, Sacramento, Cal. This patent is for the well known I. X. L. anti-friction metal which is so extensively used on this Coast as a bearing for journals.

GANG PLOW.—Charles Kewin, of S. F., Cal. In no part of the United States are gang plows used as extensively as in California, and no other part of the country has contributed as many improvements in gang plows. Mr. Kewin claims that his plow is easier operated, and less liable to get out of order than those now in use.

BALANCE SLIDE VALVE.—Henry Kessler, S. F., Cal. This patent relates to a balance slide

valve which is especially adapted to locomotive engines. The valve is so constructed that it bears against the underside of the steam chest and upon the valve seat. An arrangement of springs serves to relieve the pressure of the valve between its hearings so that it will move easily while the pressure of the steam is balanced by the equal area exposed upon all sides.

SEDIMENT COLLECTOR.—Leonard & Hancock, Oroville, Butte county, Cal. Claims a combined sediment collector and blow-off for steam boilers by which the sediment which collects at the bottom of boilers can be removed in an instant by the pressure inside of the boiler. A tube which is provided with numerous perforations is placed in the boiler below the water level. A smaller pipe passes through a stuffing box in the end of the boiler and into the perforated tube. A blow-off cock is provided at the end of this pipe outside of the boiler. The perforated tube will collect the sediment and the sliding pipe serves to carry off the impurities when the cock is opened, and for this purpose it can be moved along inside of the perforated tube. The pressure inside of the boiler serves to drive the sediment out through the pipe.

The Engineering parties on the Northern Pacific Railroad in making surveys for the location of the road between the Missouri River and Rocky Mountains will be amply protected, judging from the preparations in progress. The expedition which will start from Fort Rice, Dakota, by the 15th of June, will consist of a battalion of 10 companies of cavalry, 19 companies of infantry, a detachment of 75 Indian scouts and five selected scouts who were on the Yellowstone expedition and a detachment of artillery sufficient to man two Rodman rifled guns. Over 200 six-mule teams will accompany the expedition, which has been organized under the instructions of General Sherman. With all this escort the engineer corps of the railroad ought to possess themselves in peace, for there will not be much danger unless the Modocs get after them.

A NEW RAILROAD.—We understand that the contract for constructing the Clay Street Railroad has been let to W. H. Martin & Co. to be completed on or about the 31st day of July, 1873. It will be about two miles in length. As it is to possess some engineering novelties we may illustrate the method of operation in some future issue.

SAN DIEGO MINES.—A recent clean up from the Ready Relief mine of 80 tons of ore yielded \$2,000. The Helvetia has cleaned up a lot of \$30 per ton. The Golden Chariot, the representative mine of Banner District has just cleaned up a lot which run \$100 per ton. All the mines are doing well and times there are said to be lively.

BAKER CITY, Oregon, is quite a lively place at present. The quartz mill is running night and day, and trains are constantly arriving heavily loaded with quartz. Business of all kinds is said to be flourishing, buildings going up, freight coming, etc., all of which pleases the Baker City people greatly.

A NEW ROAD.—The superintending engineer of the Bantas and Oakland railroad, via Martinez, has commenced work with his assistants on the road. Operations were to have commenced on the tunnel at the mouth of the straits.

BOUNDARY SURVEY.—Colonel A. W. Von Schmidt has gone to Hot Springs from which point he will continue the boundary survey between Nevada and California. The survey will be made from there to the Carson Valley, and thence to the Colorado river.

NAVAL CONSTRUCTION.—Preparations are being made at Mare Island for constructing one of the eight new ships authorized by the last Congress. The armament will consist of four eight-inch and one eleven-inch gun.

LARGE FIRE.—The Lancashire Railway Company's carriage works, in Manchester, together with fifty locomotives and one hundred and fifty coaches, were burned on Sunday night.

IDAHO.—At its last clean up the Idaho Mining Company, at Grass Valley, made a larger clean up than ever was made at the mine before in the same length of time.

FOSSIL PALMS.—It is stated that between Dayton and the mouth of the Sauto Tunnel, fossilized palm trees are found in great abundance.

New Incorporations.

COLIPISE AND LEE G. AND S. M. CO.—April 29. Location: Tulare Co. Capital stock, \$500,000, in shares of \$250 each. Trustees—G. W. Ryckman, G. A. Treadwell, Wallace Emerson, C. W. Rand and O. H. Bogart. **WONDER G. M. CO.**—April 30th. Location: Tuolumne county, California. Capital stock, \$3,000,000, in shares of \$100 each. Trustees—W. J. Caday, A. F. Angell, D. H. Crocker, C. G. Jackson and Charles Keller.

Meetings and Elections.

At the annual meeting of the stockholders of the Huhn & Hunt Mining Company, held on the 28th inst., L. Maynard, J. H. Baird, James T. Boyd, J. G. Mather, R. S. Floyd, Joseph Qingot and Michael Skelly were elected Trustees. Officers—L. Maynard, President; Jas. T. Boyd, Vice-President; T. W. Colburn, Secretary; Bank of California, Treasurer.

GENERAL MERCHANDISE.

BAIRS.	PAINTS.
Eng. stand. Whit 17 @	Atlas W. Lead. 11 1/2 @ 12 1/2
Flour Sacks 1/2 @	Whitening..... 2
Stand. Gunns 1/2 @	Chalk..... 1
Wool Sacks 50 @ 65	Ochre..... 3
Barley do 18 @	Venetian Red..... 3
Hessian 40-in-gds 12 @	Red Lead..... 11
do 30 12 @	Libage..... 11
Burlaps, yard 12 @	
CANNED GOODS.	RICE.
Ass'td Pile Fruits 3 @	China No. 1, 1/2 @ 7
do 2 3 @	do 2, do 5 1/2 @ 7
do 1/2 3 75 @ 4	Japan..... 8 1/2 @ 7 1/2
Jams & Jellies 4 @ 25	Petna..... 5 @ 5 1/2
Pickles 40-in-gds 3 75 @	Hawaiian..... 5 @ 5 1/2
COAL.	SOAP.
Anthracite 20-in 1 @ 15	Castle B. D. 12 @ 12 1/2
do 18 1 @ 15	Local brands..... 12 1/2 @ 12 1/2
do 16 1 @ 15	
do 14 1 @ 15	TEA.
do 12 1 @ 15	Allice, per lb. 1 @ 15
do 10 1 @ 15	Oloves..... 27 1/2 @ 30
do 8 1 @ 15	Queens..... 30 @ 30
do 6 1 @ 15	Nutmeg..... 25 @ 25
do 4 1 @ 15	Whole Pepper..... 23 @ 24
do 2 1 @ 15	Ground Allspice..... 25 @ 30
do 1 1 @ 15	do Cassia..... 45 @ 35
do 1/2 1 @ 15	do Cloves..... 35 @ 35
do 1/4 1 @ 15	do Mustard..... 30 @ 32 1/2
do 1/8 1 @ 15	do Ginger..... 25 @ 30
do 1/16 1 @ 15	do Pepper..... 25 @ 30
do 1/32 1 @ 15	do Sugar..... 50 @ 50
do 1/64 1 @ 15	do Coffee..... 25 @ 25
do 1/128 1 @ 15	
do 1/256 1 @ 15	SUGAR, ETC.
do 1/512 1 @ 15	Cal. Cane per lb. 12 @ 12
do 1/1024 1 @ 15	Circlo A crushed 12 1/2 @ 12
do 1/2048 1 @ 15	do granulated 11 1/2 @ 12
do 1/4096 1 @ 15	Golden C..... 10 @ 10
do 1/8192 1 @ 15	Hawaiian..... 20 @ 20
do 1/16384 1 @ 15	Cal. Syrup in lbs. 52 1/2 @ 22 1/2
do 1/32768 1 @ 15	do 1 lb cans. 55 @ 55
do 1/65536 1 @ 15	do in kegs. 50 @ 50
do 1/131072 1 @ 15	
do 1/262144 1 @ 15	TOBACCO.
do 1/524288 1 @ 15	Bright Navy..... 52 1/2 @ 50
do 1/1048576 1 @ 15	Dark..... 50 @ 50
do 1/2097152 1 @ 15	Drift Twist..... 50 @ 50
do 1/4194304 1 @ 15	Light Pressed..... 55 @ 55
do 1/8388608 1 @ 15	Hard do..... 50 @ 50
do 1/16777216 1 @ 15	Conn. Wrap..... 40 @ 40
do 1/33554432 1 @ 15	Penn. Wrapper..... 35 @ 35
do 1/67108864 1 @ 15	Ohio do..... 30 @ 30
do 1/134217728 1 @ 15	Virginia Snacks..... 35 @ 35
do 1/268435456 1 @ 15	Five of one's grs..... 50 @ 25
do 1/536870912 1 @ 15	Fine cut chew..... 75 @ 80
do 1/1073741824 1 @ 15	huc's do..... 75 @ 80
do 1/2147483648 1 @ 15	Bacon's cut..... 50 @ 50
do 1/4294967296 1 @ 15	Eureka Oals..... 50 @ 50
do 1/8589934592 1 @ 15	

COFFEE.	FISH.
Costa Rica per lb 15 @ 19 1/2	Pec. Dry Cod, new 7 @ 9
Guatemala 15 @ 19 1/2	Eastern Cod 5 @ 9
Java 15 @ 19 1/2	Salmon in bls. 3 @ 5
Manilla 15 @ 19 1/2	do 2 1/2 cans 5 @ 5
Ground in cas 15 @ 19 1/2	do 2 1/4 cans 5 @ 5
Chicoory 15 @ 19 1/2	do 1 lb cans 5 @ 5
	Pick Cod, hble. 5 @ 5
	do 1/2 hble. 5 @ 5
	Cal. Smoked..... 5 @ 5
	Herr's hble. 5 @ 5
	Maack's No. 1 5 @ 5
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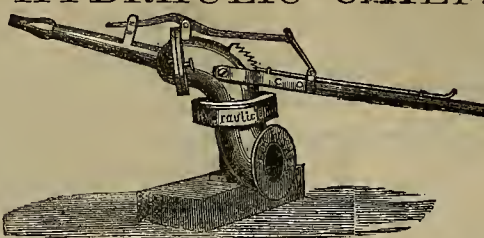
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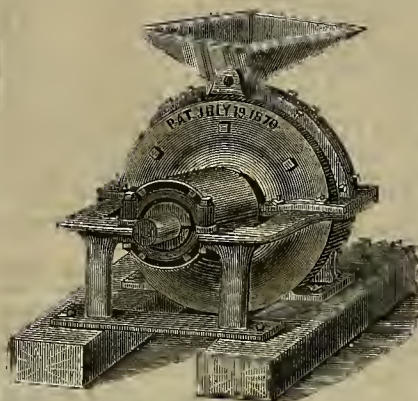
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22v25-3m

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Quartz Crushing and Amalgamating Machinery

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CAPITAL.....\$1,000,000.

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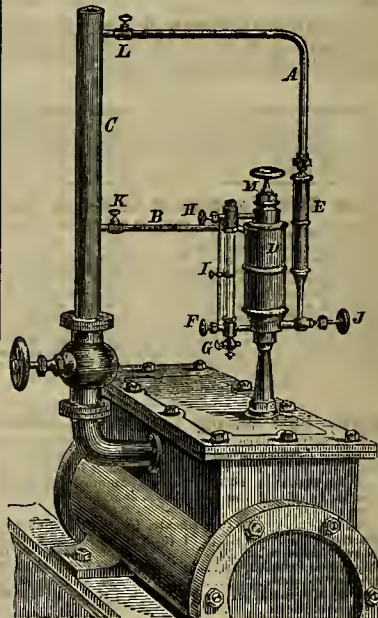
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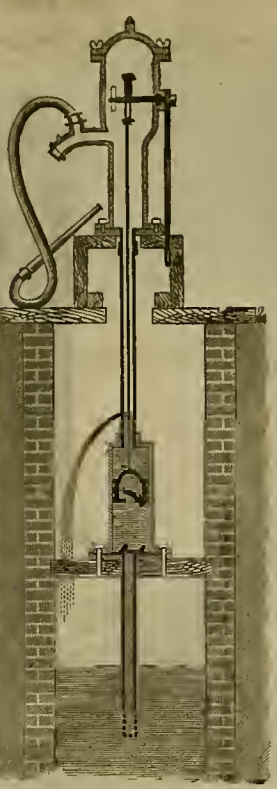
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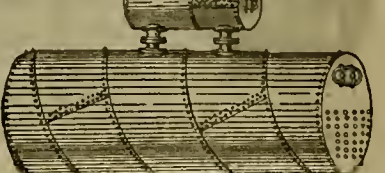
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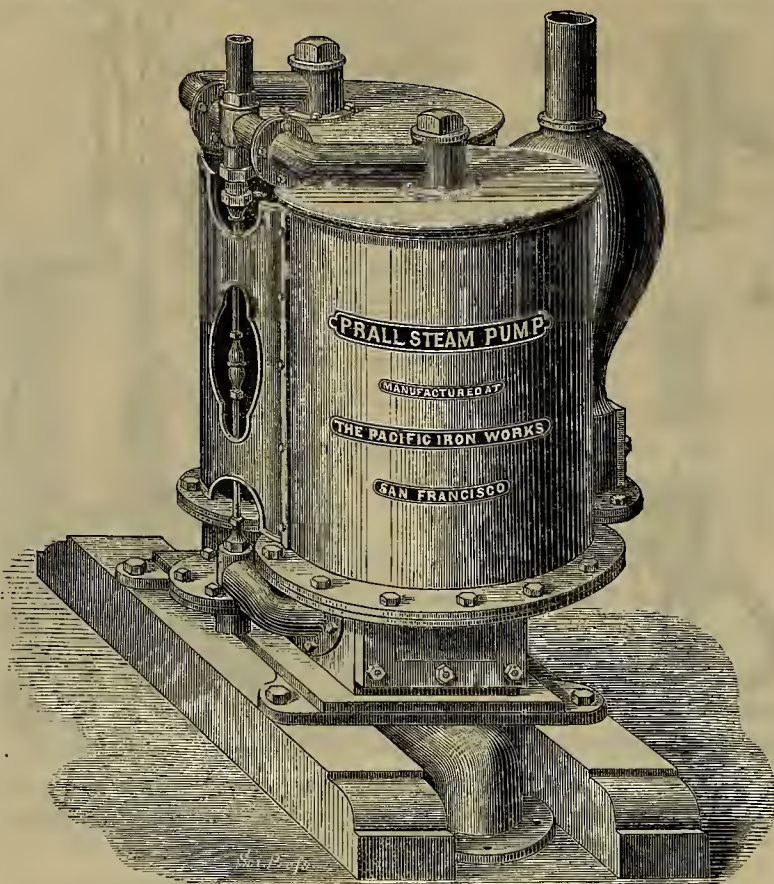
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VOLUME XXVI.
Number 19.

Stebins' Hydraulic Elevator.

Was always objected to climbing up hill. Even in our younger days when our heavy editor took the utmost delight in coasting down the steep hill sides, this sport lost more than half its pleasure because he never slid down but what he had to climb back again up the hill. It was the old story of the boy who "would walk a mile to get a horse to ride a half mile."

But when increasing age began to rob us of our youthful elasticity, and especially those of us to whom increasing age added increasing bulk, we began to have a horror at the sight of a hill to be climbed or a flight of stairs to be mounted. A simple flight of stairs we might accept as a necessary evil not greatly to be dreaded, but when it comes to climbing to the third, fourth or fifth story of a building we feel like asking to be excused. Some people tolerate this method of making the ascent from one floor to another on the grounds of exercise. We believe in exercise, but prefer to have it a little more mixed. If we could imitate Woodward's monkeys by changing the performances from our feet to our hands occasionally, one set of muscles would be relieved by another, and the exercise would be more beneficial when simply viewed as exercises. But we are not monkeys, Darwin notwithstanding, and to act like a monkey now-a-days is not considered *au fait*.

In this extremity modern invention has come to our aid. Where the ancients were content to use the primitive ladder, we are content with nothing less comfortable than an elevator. Heretofore elevators have been principally operated by steam power, and the idea of employing the hydrostatic pressure principle for this purpose is a quite recent invention, say within the last twenty years. The hydraulic elevator as formerly used was too expensive where water was paid for by the gallon, as it required just as much water to raise the empty cage as it did when it was heavily loaded. Mr. Timothy Stebins has solved this last problem for us and now we are able to employ our elevators with economy as well as with profit and pleasure.

Let some of our readers may not be well posted in the hydrostatic pressure principle, which Mr. Stebins employs, we will explain that the application of the principle consists in introducing water which is incompressible and non-elastic, into a strong metallic cylinder under pressure. This cylinder is truly bored and furnished with a movable piston, which is made perfectly water tight by means of suitable packing, neatly fitted into the cylinder, and the pressure of the water upon this piston will move it from one end of the cylinder to the other.

Thus it will be seen that a machine can be made capable of exerting as great a force as may be needed by enlarging the piston area. Mr. Stebins employs the water pressure in our

city water pipes, for obtaining the necessary force for raising his elevator cages.

The cylinder which he uses is a horizontal cylinder (seen at the left side of the drawing). It is the water pipe through which the water is introduced into the cylinder between the piston and cylinder head so as to force the piston to the opposite end of the cylinder. The piston

tion as the cage descends and as the water flows out. Mr. Stebins has also invented a novel three way cock which he employs both to admit the water to and discharge it from the cylinder, both operations being performed by pulling upon a single rope, so that any person, however ignorant of mechanics in general and elevators in particular, can operate the cage.

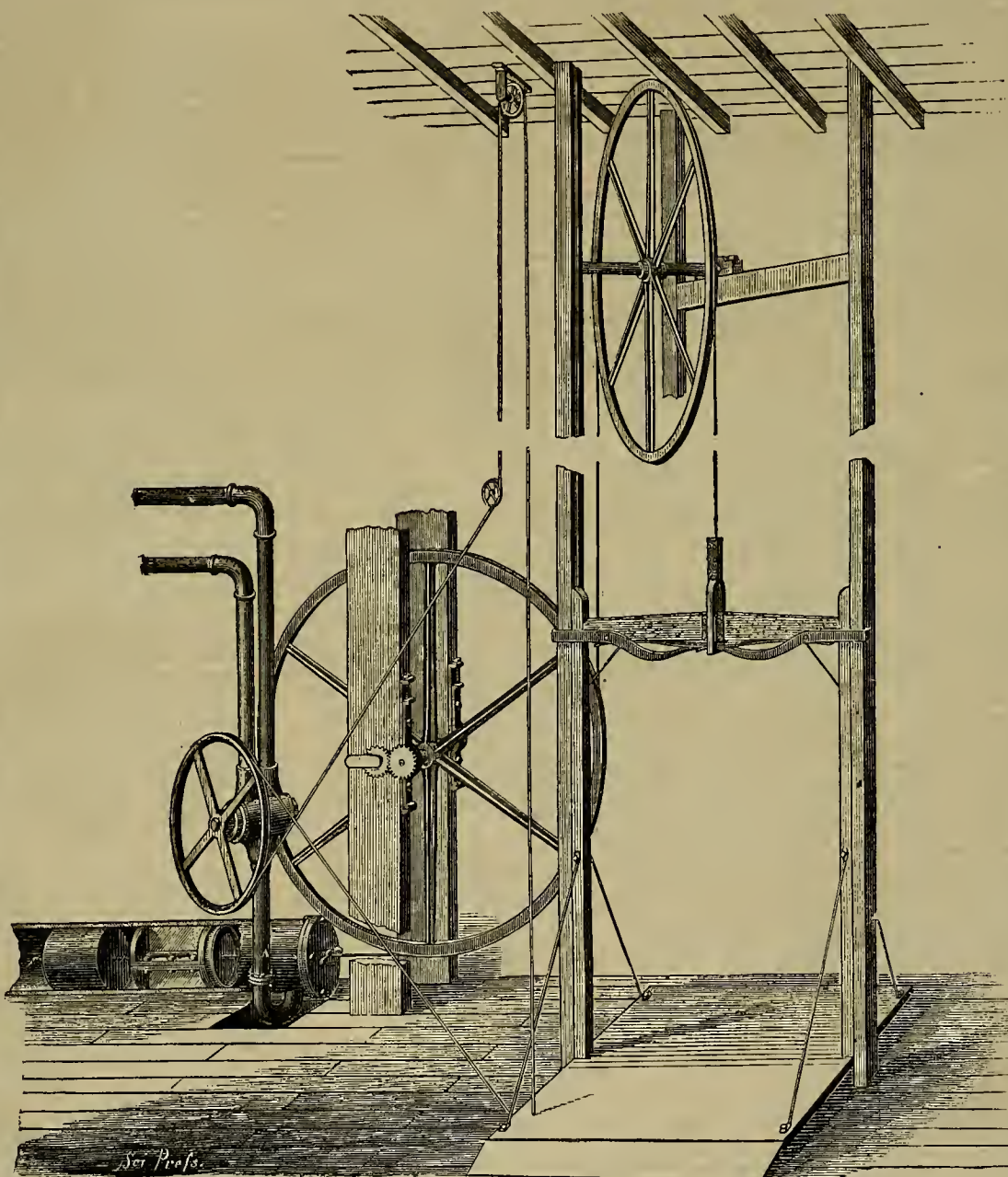
strength by simply pulling a little harder upon the rope. This arrangement accomplishes a great saving of water in the course of a year, and for stores and other places where it is frequently necessary to raise heavy loads, the double cylinder arrangement would be preferable, but for private dwellings, hotels and business houses we can conceive of no more economical and neater arrangement than the one herewith illustrated. Besides the above inventions Mr. Stebins has improved various parts of the apparatus used in connection with the elevator, relating to the safety and the easy working of the apparatus so that he is now able to furnish what seems to be a perfect machine.

A number of these elevators have been put up and are now in use in this city. Among other places where they are used we refer to Heyneman & Co., No. 5 Sansome St.; Heller Bros., 112 and 114 Sansome St.; Triest & Friedlander, 116 and 118 Sansome St.; Feigenbaum & Co., 120 and 122 Sansome St.; Goodkind & Fecheimer, Bush St., between Sansons and Battery; Steinhart & Co., Oriental Block, Howard's building, (2 elevators) corner O'Farrell and Stockton Sts.; and Milton S. Latham's residence, Menlo Park, all of whom give the elevator the highest praise.

For further particulars apply to, or address, Stebins' Hydraulic Elevator Co., No. 32 Merchants' Exchange building, San Francisco, Cal.

THE BENICIA RAILROAD.
Another narrow gauge railroad enterprise was inaugurated last week, on the occasion of breaking ground at Benicia on the California Central Narrow-gauge Railroad Company's road. This road will run through the counties, Solano, Yolo, Colusa and Tehama to Red Bluff, a distance of 158 miles, being about 86 miles shorter than the present route from Benicia. The road will run northerly, crossing the valley north of Bridgeport, thence in a northeasterly direction near the foothills north of Fairfield, to Woodland; thence via Colusa, to Jacinto, Tehama and Red Bluff. From Jacinto a branch road is to be constructed to Chico, and Governor Bidwell has taken a large amount of stock. In order to induce farmers generally to take stock, the company contract with all who subscribe equal to one dollar for each acre owned, to transport their farm produce for 2½ cents per mile, for 5 years after the completion of the road. It is thought the rich farming land through which this road will run and its connection with rich mining counties, will make the road a profitable one. The following are the officers of the company: Cornelius Cole, President; M. D. Townsend, Vice-President; R. L. Tracey, Treasurer; Wm. W. Magary, Secretary; Wm. S. Watson, Chief Engineer.

The Epizooty is disappearing slowly from our midst, but a few ox teams are employed yet by Wells Fargo & Co., for hauling silver bullion and other heavy freights.



STEBINS' HYDRAULIC ELEVATOR.

has a flexible piston rod which is made of steel wire. This piston rod passes through a stuffing box in the end of the cylinder and around the large pulley as shown. It then passes upward and over another pulley near the roof of the building and thence down to the cage, to which its opposite end is secured. Now it is evident that when the piston is caused to travel through the cylinder by the water pressure the flexible piston rod raises the cage or elevator platform. Then by shutting off this water and opening a cock which allows the water to discharge from the cylinder the weight of the cage will draw the piston back to its original position.

All he will have to do is to pull upon the cord until the cage begins to ascend, and then leave it alone until he arrives at his destination. A further pull upon the same cord will then stop the ascent of the cage, and when he desires to descend another pull upon the same cord opens the discharge cock and the cage moves down again. This is what we call simplicity simplified. Mr. Stebins is also the inventor of an elevator in which two upright cylinders are employed in such a manner that when a light load is to be raised only a single cylinder is employed, but when an unusual weight is to be raised both cylinders will respond with their united

CORRESPONDENCE.

The Vienna Exposition.

[From our Regular Correspondent, GUIDO KUSTEL.]

In spite of the continued labor at the Vienna Exposition ground, the totality will not be finished before the opening on the first of May. The Austrian

School Objects Exposition

Has been, by order of the Ministry of Education placed in the Rossaner gymnasium. It comprises five main groups: the University, Middle schools, Municipal and Technical schools and children-gardens. It shows a massive material of students' elaborations and means of education; but it does not quite distinctly represent a summary view of school matters. Nevertheless there is a rich and multifarious collection, well arranged in groups. A very interesting and most perfect analytic preparation of injected insects, human and animal organs is that of Prof. Hyrte; also a picturesque representation of the theory of glaciers, zoological objects, etc. In one of the rooms are the elaborations of scholars of the technical schools. In this department, Bohemia is well represented.

The lower school department shows also a rich collection of pictures, models and other collections. Very attractive are those of the middle schools, showing physical instruments, models, drawings, hand-writings, etc. The Prussian Ministry of Education sends to the exposition a model of a "Turnhalle" with side rooms belonging to it. It represents the Turnhalle of royal Wilhelm's gymnasium at Berlin, 1-12 of the natural size. In the same proportion are all utensils and the whole inner outfit.

The jury Commissioners of the Exposition will commence their examination and investigation on the 15th of June, and have to finish it at the beginning of August. Each group of the jury will have a president and two vice-presidents selected from the different nations exhibiting.

An international congress for the

Discussion of Patent Rights

Will meet at Vienna on the 4th, 5th and 6th of August, under the following rules:

1st. All industrial representatives, technologists, farmers, etc., of all nations are entitled to a participation in this congress.

2d. The application for participation in the Congress has to be made at the relative exposition offices of the different States.

3d. The Government of the exhibiting nations can, if they choose, be represented by their delegates.

4th. The general directory will appoint a Preparatory Committee to prepare all the material submitted to the Congress.

5th. The Congress will be opened by the general director of the Exposition; it then elects its President and the Bureau arranges the order of business.

6th. The Congress language will be German, but English, French and Italian will also be admitted.

7th. All papers, propositions with reference to patent rights, are to be directed to the "General Direction of the Exposition" at Vienna, if dispatched before the meeting of Congress, if during the same, to the "Bureau of Congress."

Experiments with Agricultural Machines

Will be made on the field, four miles from Vienna on the farm Leopoldsdorf, between 23d of June and 30th of July, according to the condition of the weather. Three days after the experiment the machines must be returned to the Exhibition Palace. Each steam plow receives for a preliminary experiment 14 acres of land, and all steam-plows for regular plowing experiment 50 acres of clover-land and for plowing in of dung 42½ acres. Every thing necessary for experiments with other agricultural machines is provided for.

Miscellaneous Doltings.

An agreeable promenade of 120 miles has to be performed through the various avenues and alleys of the Exposition building, in order to see everything in detail that is exhibited there, including all the villas and other buildings. Thirty-two potentates will visit the Vienna Exposition. Among the medical plants at the Exposition there will be "Valeriana celtica." This plant, under the name of "Speik," is exported annually up to 10,000 oz., principally to India, where it is burned in honor of different idols. From Lower Kurnten (Austria) will be exhibited a desk made of ninety different kinds of wood, grown there; San Francisco sends a table showing the variety of California woods.

It is admitted even by the French, that the superiority of the German arms and their victories are based on the higher technical education of the people. It is illustrated by the following fact: Of 13,000 students of the German high schools, 4,510 took up arms in the late war. Of this number, 2,745 were combatants, and 248 were killed. The proportion

shows that 30 per cent. of the school youth offered their lives for the defence of Germany, while only 3 per cent. of the total population took part in the battle and other war services. Again while only two per cent. of the latter lost their lives, of the combatant students full 10 per cent. were killed.

Professor Boeck was appointed to collect and arrange for the exposition all material of the protestant schools of Cisteithania(?). The French corporation of working men in Paris resolved to vote the necessary funds for the purpose of sending some of their men to the Vienna exposition, after a help from the national assembly had been refused.

Influence of the Velocity of Impact on the Effective Duty of Stamps.

By WILLIAM MAIN, JR.

It is well known that but a fraction of the mechanical work expended in lifting stamps, is usefully employed in the fall, also that the value of this effective fraction varies between wide limits. The total amount of power developed in the fall, may be divided into two portions; first, that usefully expended in actual crushing; second, that which is wasted, in jarring the foundation, and in heat. The heat is produced both by friction and by force of compression, not expended in fracture. The most economical work would be performed, when the blow is exactly sufficient to crush the rock with a minimum of jar communicated to the mortar bed. A fragment of rock may be just strong enough to resist the blow of a stamp; the whole force of the blow will be transmitted through it to the foundation. A slightly harder blow or smaller piece of rock, would have caused a useful expenditure of power in breaking the rock to fragments, leaving a smaller residue for useless vibrations.

Stamps may be classed under two heads. First, those with a free fall. Second, those whose fall is accelerated by a force added to that of gravity. The latter division includes all those of which the fall is accelerated by the pressure of steam, air or springs.

The same amount of mechanical power may be expended in raising a heavy stamp a certain height, or in raising a lighter stamp to a proportionally greater height or, in raising a light stamp to the height of the heavy stamp, and then accelerating its fall by a pressure equal to the difference of weight. In all these cases the amount of power expended is the same while the useful effect will be different.

It must be distinctly realized that all solid bodies, however hard, are to some extent elastic, and therefore capable of compression, with certain limits, without fracture. A body is harder as the resistance it offers to change of shape is greater; more brittle as the limits are narrower within which change of shape may be effected without fracture. A stamp falling on a block of rubber may cause a depression of three inches; falling on a block of granite, a depression of 1-50 of an inch. The pressure to which the blow is equivalent is inversely proportional to the depth of compression. The pressure on the granite will be 150 times that on the rubber. The time occupied in effecting this depression will, according to the laws of retarded motion, be twice that occupied by the stamp in passing freely, at its maximum velocity, over an equal space. In striking the rubber block, the stamp will be brought to rest in a time during which, at its maximum velocity, it would have fallen six inches. Striking the granite block, effecting a depression of 1-50 of an inch, it is brought to rest in a space of time during which it would have fallen 1-25 of an inch, had the block not been there.

A stamp which has fallen freely 15 inches, will have attained a velocity of nine feet per second (very nearly) and will be arrested by the rubber in 1-18th of a second, by the granite in 1-2700th of a second. The speed with which the vibration, or impulse of compression is transmitted through a solid body, is far greater than the greatest velocity of any stamp. At the instant the stamp has come completely to rest, the compression it has made will have extended into the block to a depth ranging with the nature of the material.

Vibrations are transmitted through granite with a velocity of 1,660 ft. per second. In the case presupposed, the stamp will have expended its whole force in 1-2700th part of a second, and the compression caused by it will have extended a little over seven inches in all directions from the stamp. The figure of this solid of compression (if it may be so termed), which has taken up the whole force of the stamp, will approach a hemisphere having a radius of seven inches.

Let us suppose that instead of raising a stamp of 400 lb. weight to a height of 15 inches, an equal amount of power is expended in raising a 100 lb. stamp to four times the height, or in raising it 15 inches, and then accelerating its fall with a pressure of 300 pounds of steam. In each case 500 ft. lb. are consumed, the final velocity of the lighter stamp being twice that of the heavier.

To compare the effects of bodies possessing the same mechanical movement but different velocities, let V denote the velocity with which

the resistance R is encountered at the beginning of the time T . Let v denote the final velocity, G the weight of the body, and g the acceleration due to gravity. We have then from the laws of retarded motion the formula—

$$v = V - \frac{R}{G}t$$

When the body is brought to rest, v becomes zero and the equation

$$V = \frac{R}{G}t$$

t being the time required in coming to rest.

If a body of one-fourth the weight (1-4 G) having a double velocity (2 V), encounter an equal resistance, it will be brought to rest in a space of time represented by t . By substituting these values and combining the new equation with the last we find $t = \frac{1}{2}t$. The body of one-fourth weight, but double velocity, comes to rest in one-half the time, expending of course, an equal mechanical power.

Applying these principles to the case in point, we see that, as the lighter stamp expends its whole force in 1-5400th part of a second, the compression caused by it can extend in that time but $3\frac{1}{2}$ inches into the block. If the face of the stamp shoe is very small, the bulk of the rock over which the compression would extend itself, would be to that compressed by the heavier stamp, very nearly as one to four, or inversely as the cubes of the velocities. If the upper face of the block is not larger than that of the stamp, the whole compression will be transmitted directly downward, and the bulk of rock compressed will be inversely as the velocities.

By the more rapid blow the same amount of mechanical power has been concentrated on a smaller bulk of rock and the crushing effect is proportionally greater. Let us suppose the block of stone to be formed into a die with a face equal to that of the stamp-shoe and a depth $3\frac{1}{2}$ inches. At the instant when the heavy free-falling stamp has come to rest, exerting its maximum of compression, one half of the force of the blow will have passed through the block into the foundation and be expended, in jarring it and the ground about it. If, as before said, the stone be just strong enough to resist the blow, the whole force of compression will pass off in useless vibrations.

If the lighter stamp with accelerated motion strikes the same block, the compression produced by the blow will not have extended to the foundation, before the whole force of the stamp is expended. The stone will therefore be crushed to pieces.

Future economy in stamping is likely to be attained, not by increasing the weight of stamps, but the velocity of the blow. Practical objections to a high lift are numerous. Velocity can be much better attained by accelerating the fall, as the height of the lift may remain the same or even be diminished, and a greater number of blows struck per minute. The forging of hot iron so obviously demanded this, that the principle has long since been applied to the trip hammer.

In wet stamping, the rapidity with which a stamp is raised, influences greatly the amount of solid matter held in suspension. As the stamp rises, water flows from all sides to supply its place. The more rapid the rise of the stamp, the greater will be the velocity of the water, and the more surely will the finely crushed rock be whirled up into a state of suspension. If the blow is succeeded by another before the finer particles have settled, the stamp will act only on the coarser particles, packing less and sending more of the slime through the screen.

In some of the later forms of the stamp mill, while the principle of an accelerated blow is adopted, other novelties with which it has been combined, have been less well-conceived, and have done much to conceal its advantages.

The principle of high velocities finds its commonest illustration in the action of a bullet on a freely suspended object. If it be a block of wood, even although too thick for the ball to pass entirely through, almost the whole of the mechanical effect will be expended in crushing and dividing the fibres directly in its path, leaving little residue for producing oscillations. A heavier body with less velocity, would cause less crushing but greater oscillations. Stamps of high and low velocities of stroke have similar comparative effects in crushing the fragments of rock lying immediately under them, or jarring the mortar bed.

In blasting rock, quickness of explosion is equivalent to velocity of impact. The force of compression radiates in all directions from the drill hole. While the slower explosives take advantage of the weaker seams and have a splitting effect that runs to greater distances, the shattering effects of the explosion will vary directly as the volumes of gas generated, and inversely as the cubes of the times of explosion.—*Engineering and Mining Journal*—from the forthcoming Report of the U. S. Commissioner of Mining Statistics.

RYE PATCH MINES.—A dispatch to the *Alta* from Rye Patch dated the 1st inst. says that four bars of bullion were shipped from there the day before by the Rye Patch Company, making \$16,000 shipped on the April account. The ore developments in the north drift of the above named mine are simply immense. The pulp assay gives \$120 per ton. Assays made from a selection of ore samples gives \$1,150 per ton. With additional milling facilities, this mine must soon be added to the list of dividend-paying ones.

The Crown Point Mine.

The science of quartz mining has been carried to a very high point, says the *Alta*, in this case of the magnificent works of the Crown Point. The perfect machinery and appliances of that mine work with the noiseless precision of a clock, and 600 tons of ore of the value of \$48,000 per day are drawn from the drifts, lifted 1,700 feet to the surface, and transported to mill almost without handling. This is the regular work, but as much as 850 tons has been sent from the bottom of the mine to the mill in a day. It is very difficult for the uninitiated to appreciate the vastness of this result, or the automatic vigor with which it is produced. The main shaft of the mine was sunk 1,000 feet perpendicular to the 10th level; it there struck the body of ore now working. This ore is in a vein of which the foot wall is a hard species of granite, descending at an angle of a little less than 35 degrees. On this foot wall an incline was started, which has now reached nearly to the 15th level, a perpendicular of 500 feet, or over 850 on the incline from the bottom of the shaft, or 1,850 feet from the surface. As this incline descended levels were opened at each perpendicular depth of 100 feet. The ore which had been struck in the 10th level was found to be more extensive and richer in the 11th. The 12th showed still better results. The 13th is now 400 feet long, over 100 wide, and the ore mills \$80. The 14th is nearly ready to open, and the 15th level has been reached by the incline. On this incline runs an iron car of the newest construction, of a capacity of three tons of ore. It is worked by a steel rope operated by the steam works above. This car they have named the "Giraffe." Along each of the open levels, the 13th, 12th, 11th and 10th, run cars which bring the ore from the breasts and dumps into the Giraffe as it ascends the incline. Thus loaded the Giraffe reaches the top of the incline, or bottom of the shaft, where it dumps its load into small cars, which hold about 1300 pounds each. These run immediately upon the cage, are lifted to the surface by steel ropes worked by steam, and unload themselves into vehicles that take the ore to the mills. The powerful machinery is worked unrelentingly through the 24 hours, as it were pumping ore from the levels, incline and shaft, and discharging in upon the railroad race that feeds the ten or twelve remorseless mills which extract from it the last speck of bullion. By this means, as we have said, 600 tons of ore is daily drawn from the bowels of the earth and ground into pulp at the mills. Now, it will be observed, that the incline car, or Giraffe, holds 3 tons, consequently it must be filled and emptied 200 times in a day, and must 200 round trips from the bottom to the top of the incline, a distance of 850 feet. But 200 trips in 24 hours is one trip in 7 minutes. The car then must be loaded and unloaded and travel 1700 feet in 7 minutes, and, as we have said, it has done it in 5 minutes to raise 850 tons in a day. This gives an idea of the precision and power of the machinery. It will be borne in mind that where so much ore is taken out a vacant space remains. These spaces are, as fast as the ore goes, filled in solid with heavy timber, so that caving is impossible. There is also at the surface an enormous tank kept filled, with water, raised by the pumps from below. This water is conveyed in pipes to parts of the mine, where it is used with ice by the men, and may be promptly applied, with the hose always ready, to deluge any appearance of fire. All these gigantic automata, directed by Mr. Kellogg, one of the most experienced and able engineers, are applied to the extraction of a body of ore which has no parallel as yet. It has been followed through four levels, and two more are about to be opened. The quantity of ore which has been laid open will last four years at the present rate of working, and there is no doubt whatever of its indefinite continuance. The peculiarity of this ore body is that while all those found hitherto in the Comstock have been perpendicular to the foot wall, and ending with it, that in the Crown Point runs with the stratifications and improves in size and richness as it goes downward. The great and continued improvements in the self-acting machinery nearly obviate the inconvenience of deep working since the expense of a few hundred feet, more or less, is barely appreciable. The United States Consul General, at Mexico, reports the Guatimocin silver mine, which produced \$97,000 profits for the year 1870, at a value of \$5,000,000. The Crown Point earned \$2,100,000 in three months to April 1, and paid \$1,100,000 to the stockholders. This month of April it will earn nearly as much as did that Mexican mine for a year.

ORE SHIPMENTS.—A dispatch from Salt Lake states that Little Cottonwood's ore shipment for last week was 600 tons. The Emma mine is shipping fifteen tons daily. Much preparatory work is being done in this mine. The Flagg-staff is shipping thirty tons of ore daily to the Davenport Smelter. This mine has just shipped seven tons and \$1,100 worth of bullion. Fifty tons are to follow.

RAILROADS.—The whole cost of the American 69,000 miles of railroad is about \$3,437,638,749, which is a sum not very much greater than England has spent on her 16,000 miles of railroad.

MECHANICAL PROGRESS.

Paper as a Material of Construction.

The *Iron Age* contains an article on the use of paper as a material of construction from which we condense as follows:—Whether or not we are about to enter upon what will be known in the future as "The Paper Age," has lately become quite an interesting topic of discussion. Be this as it may, there is evidently a future for paper, in which it is to become the general, if not universal, substitute for wood, leather india rubber, and, to some extent, copper, tin, and zinc.

During the past few years a great deal of attention has been given to this subject, and the results already attained, though comparatively unimportant in themselves, show the possibilities of this material and its more or less perfect adaptation to a thousand uses to which no one has yet thought of applying it. In proportion to weight it is, probably, the strongest material known, and combines more perfectly than any other substance the qualities of strength, lightness, flexibility, durability, and cheapness. So many and various are the materials of which it can be made, that it can be manufactured in quantities practically unlimited in every civilized country of the world, and so long as plants grow, paper manufacture can be sustained. It is, under all circumstances, an easy material to work and handle; in short, it possesses every requisite quality, and, like many another material now indispensable, its utility is discovered just as we are beginning to feel the need of something cheaper and more abundant than wood, leather, and hard rubber to substitute for them.

Some idea of the diversity of uses to which it has already been applied may be inferred from the fact that, at the recent fair of the Franklin Institute, the display of articles made wholly, or in great part, of paper, comprised oil cloth, patent leather, and leather suitable for insoles, gas pipes, whip handles, saw handles, knives and forks, combs, buttons, washers, roofing and car-wheels. There are also many other uses to which it has been adapted, which were not shown, such as slats for window-blinds, panels for doors and ceilings, boots, collars, cuffs, bosoms, etc. The Japanese, in fact, make almost every possible article of clothing of paper, from a pocket-handkerchief to an overcoat.

Even iron is not adapted to use so widely various, and certainly no other material has yet been found which, at the same cost, could be made to answer so many purposes. These, it must be remembered, are but the first fruits of American inventive talent, as yet scarcely stimulated in this direction; and what may we not expect when, with a growing demand for manufactures of paper, there shall be more inducement than now offers for investigation and experiment.

Why cannot our railroad cars be made of paper, instead of iron, as proposed, so as to prevent the danger of splintering and burning, in case of accidents? As timber becomes scarce, our houses can be entirely built of paper.

It is said that paper pulp can be readily brought to such a state of toughness and solidity, by pressure, as to be almost as fire-proof and indestructible as iron.

It requires but little farther progress in this new branch of manufacture to so perfectly and universally adapt it to all the varied requirements of the human family, that "the coming man" would have little use for anything else from the time he was placed in his paper cradle until he should be "gathered to his fathers" in a paper casket.

ASPHALT PAPER is likely to become of great use in many ways. In thin sheets it is useful for wrapping silks or other fabrics that need protection from moisture, for lining the cases, or packing boxes for pianos, etc., or rolled up into pipes for conveying water. Asphalt tubes are only one-fifth the weight of iron, will not rust, and are quite tough and strong. The tubes are simply sheets of paper, of a peculiar quality, dipped in melted asphalt, and then rolled upon a cylinder. A machine for preparing the asphalt wrapping paper consists of a hollow cylinder, heated by steam, and a wedge-shaped box, containing the hot asphalt. The box has a narrow slit, the width of the paper, and as the paper passes, a thin layer of asphalt is distributed on the paper just before it passes the cylinder.

EXPERIENCE WITH STEEL-TOPPED RAILS.—The *Springfield Republican*, of March 25, says: "The German steel rails laid as an experiment, last fall, for two miles east of this city on the Boston & Albany Railroad, are not working very well, the steel top fits into the iron bottom somewhat wedge-fashion, and the weight of the trains is crushing out the iron."

FIRE-PROOF ARTIFICIAL STONE.—A French company are manufacturing an artificial stone by mixing quartz sand with a saturated solution of chloride of calcium, and burning like fire-brick. Some of the sand unites with the calcium to form a silicate of lime, which cements together the remainder of the sand into an artificial sand-stone.

Wire for Building Purposes.

A singular novelty has recently been introduced in England—an invention for applying wire to building and other purposes. The invention—which is due to Mr. Humphrey Turner, of the Cardigan Steel and Wire Works—consists in the application of wire cast in strips, of iron rolled to special patterns, for walls, ceiling, roofs, and floors of buildings, as well as for cisterns, water tanks, brewers' squares, and other vessels. Its chief utility however, is in the erection of houses.

The inventor proposes to use it in this way. The foundation is laid, and brought up 12 to 18 inches above the ground. Cast metal standards and straining posts are fixed at certain distances. Wire, from a half to two inches apart, is attached to these, and strained from the posts through holes in the standards. Panels and proper stay posts are then fixed inside the wire at proper distances, varying according to the thickness of the walls required. While the walls—formed by means of a concrete—are being raised from the inside, the plasterer may carry on his work on the outside, by laying on a superior material, consisting of cement and sharp sand. The wall having been brought up to the height required for the first floor, iron plates are then laid upon them, with holes for the wire to pass through. An iron or cast-metal beam is next thrown across the centre of the rooms from wall to wall, and when the walls are complete the wire is strained upon them through the plates.

In this manner, it is claimed, the whole of the building is securely "tied." The inventor thinks that the wire will supersede the use of floor joints of wood, and will, at the same time, form beds for concrete floors. Another advantage is, that they will serve on the under side as laths for the plastered ceilings, and the plastering may be carried on at the same time as the laying of the floor in concrete. The builder—or rather, wire worker—then goes on to the next floor, which is completed in a similar manner. When the height is attained, the plates and beams are laid so as to give the necessary fall for the water, and a wall is carried on the top of the plates for three or four feet. The wires are then strained across the whole of the top. Concrete is laid on these, rafters and slates being thus dispensed with. For this, as for all new things, great merits are claimed—no wood save for doors, cupboards, sashes, and window-frames; houses almost fire-proof, and vermin-proof as well. It will be a singular circumstance if the manufacturer of wire, which has of late years been marvellously increased, should be extended to "stringing up" houses in the manner indicated by Mr. Humphrey Turner's invention.

Proposed Sawing by Electricity.

We made mention some time since of the application, by an American inventor, of electricity as a medium for sawing wood.

When an electric current is transmitted through a fine platinum wire, the wire becomes red hot. The invention in question is for utilizing this principle for the purposes of cutting wood. The patentee says that he was led to this novel application of electricity by observing the facility with which a platinum wire, when raised to a white heat, effected the removal of tumors. It is anticipated that by means of this invention, which requires, so it is said, only a simple quantity battery, trees may be felled and divided into logs, and other wood-cutting operations performed with more facility than by the usual methods.

An English writer throws a wet blanket over this proposed novelty as follows: "We venture to say that no tree ever has been felled or ever can be felled by this method. If a tree were a fusible substance, like soap or tallow, a red hot wire might no doubt be passed through it, but even then there would be a continuous absorption of heat in the liquefaction of the material which might prevent it from being a beneficial process. Timber, however, mainly consists of charcoal, which is infusible; and although in a very superficial cut sufficient air might obtain access to the heated wire to enable the charcoal to be burnt, no such result could be expected in the case of such deep cuts as are necessary in felling trees; and if the charcoal can neither be melted nor burnt how can the felling operation be performed? The most moderate penetration is sufficient to show that the scheme is visionary, and it will be time enough to believe that the felling of trees can be accomplished by this method, when the felling operation has been successfully performed."

SAWDUST FOR ARTIFICIAL WOOD WORK.—The use of sawdust for artificial woodwork, seems to promise a success. Alum, glue, and sawdust are kneaded with boiling water into a dough, which is pressed into moulds; when dry it is hard, and capable of taking a high polish. Similar ornaments of greater beauty and resembling carved wood work very closely, are being made by pressing veneers between steel or copper dies.

DANKS, the well-known inventor of the Rotary Puddling Furnace, which bears his name, has invented an improved method of lining such furnaces, for which the furnace is said to be greatly improved in its weakest point.

SCIENTIFIC PROGRESS.

The Mechanical Equivalent of Heat.

A writer in the American *Artisan*, who has evidently paid much attention to the subject, says:—"The mechanical equivalent of heat seems to be a myth. Thus, Dr. Meyer makes 772 foot pounds the equivalent of a unit of heat, by assuming that the heat, which disappears during the expansion of a gas under the pressure of the atmosphere, is the energy which overcomes all this pressure; that is, fifteen pounds per square inch. But this is obviously an error; the resistance to the expansion of the gas, being only the difference between the pressure of the atmosphere, and the expansive force of the gas at that temperature. Thus, the elastic force of a cubic foot of air, exactly balances the pressure of the air surrounding it, and if its volume be doubled without adding heat, it will still press about five pounds on the surrounding air, therefore, the work done in overcoming the pressure of the atmosphere, when doubling the volume of gas by heat, is five pounds to the inch, instead of fifteen pounds, as assumed by Mayer, and illustrated by Tyndall, in his *Heat as a Mode of Motion*."

Again, "The sensible heat, 490°, added to the gas at 32°, to double its volume, exactly balances the atmosphere at each step of expansion, so that, though 351 foot pounds of work is done for each unit of heat which disappears, it does not appear how this disappearing heat does more work than is theoretically required to 'tip the beam' of a perfect balance."

All the figures are given in round numbers, but approximate the truth sufficiently to illustrate the principles involved. Notwithstanding Joule, in his efforts to prove the theory by hundreds of experiments arrived at results varying from 587 to 1,086, foot pounds, and Seguin, after the elaborate experiments of Reynault, fixed the equivalent at 3,000 foot pounds; still the "authority" have accepted the figuring of Dr. Mayer—772 foot pounds, as an elementary principle in Dynamical Philosophy.

The writer in the *Artisan* continues as follows: "Heat, light, electricity, magnetism, chemical affinity, and mechanical motion are energies, which interchange, directly, or indirectly, with each other, and very little is known of the exact conditions required for their interchange. Thus, the friction of phosphorus produces light, friction of glass and amalgam, electricity, and that of some perfectly homogeneous substances, more heat relative to other molecular energies. And, again, it is impossible to determine the exact quantitative relation between heat and light; for light exists where it is imperceptible to our senses, but perceptible to the vision of some animals and insects.

In view of these facts it would seem impossible, in the present state of knowledge, to determine the exact mechanical equivalent of either of these molecular energies, isolated from the others. That is to say, friction, or percussion, equal to 772 foot pounds of mechanical power, produces undeterminable quantities of these energies, severally depending on the molecular construction of the rubbing or colliding substances, and on other conditions, of which we are ignorant; therefore, it is irrational to assume, under any circumstances, that this mechanical power is all metamorphosed into heat. And, further, the instability of molecular energies, or their liability to interchange with each other, or otherwise disappear, as in electricity, steam-power, and generally in heat and the combustion of fuel, demonstrates both the complexity and our ignorance of the laws which govern them.

Thus, fuel burned in a furnace, subject to precautions against waste, which appear to insure perfect combustion, produces but about one-twentieth as much heat as when burned in the animal body. And further, it has been found that the mechanical power produced by the evolution of equal quantities of these energies through animal bodies, and inorganic mechanisms, is severally, as six to one, though the experiments were made with dead animal matter.

That mechanical and inviolable motions have their exact relative equivalents may not be denied; but an exact mechanical equivalent of heat scarcely harmonizes with observed phenomena, and may, logically, be considered a myth."

PRACTICAL APPLICATIONS OF THE ELECTRICAL LIGHT.—The disaster to the Northfleet has been the means of directing attention to a powerful electric light, to the inventors of which the Academy of Sciences in Paris have awarded their great prize of 50,000*fr.* It is the solution of a problem that has occupied the minds of electricians for many years past, and it is the only method by which a continuous current can be obtained by means of a magneto-electric machine. It is, then, specially applicable for producing a powerful light, to be placed on the foremast of an ocean-going steamer; for, in contradistinction to all other magneto-electric light machines, the simplicity of its working parts is so great as to enable it to be worked for months together without requiring even the smallest attention. It can be driven by a very small steam-engine, or by using a very small amount of the power of the engine which drives the vessel, and the experiments made with it in Paris appear to have been so successful as to induce one of the great French steamship companies to adopt its use.

Relation Between Heat and Electricity.

The following facts concerning the relation between heat and electricity have been laid before the British Royal Society by Mr. Frederic Guthrie. The discharging power of a hot body diminishes with its distance and increases with its temperature. But the discharging power of a hot body does not depend upon the quantity of heat radiated from it to the electrified body, but chiefly upon its quality. Thus a white hot platinum wire connected with the earth may exercise an indefinitely greater discharging power, at the same distance, than a large mass of iron 100 deg. C., though the latter may impart more heat to the electrified body. Neither the mere reception of heat, however intense, by the electrified body unless the latter have such small capacity as to be itself intensely heated, discharges the electricity if the source of heat be distant; nor is discharge effected when the electrified body and a neighboring cold one are surrounded by air through which intense heat is passing. But for the discharge, it is necessary that heat of intensity pass to the electrified body from a neutral body, within inductive range.

As hot iron shows a preferential power of discharging negative over positive electricity, so it is found that white-hot but isolated iron refuses to be charged, either with positive or negative electricity. As the iron cools it acquires first the power of receiving negative and afterward of receiving positive. Further, while white-hot iron in contact with an electrified body prevents that body from retaining a charge of either kind of electricity, as it cools it permits a positive charge to be received, and subsequently a negative one. White and red-hot metallic neutral bodies exercise this discharging power even when isolated from the earth, but always with less facility than when earth-connected. The hotter the discharging body, whether isolated or earth-connected, the more nearly alike do positive or negative electricities behave in being discharged; but at certain temperatures distinct differences are noticed. The negative electricity, in all cases of difference, is discharged with greater facility than the positive. It is shown that various flames, both earth-connected and isolated, have an exceedingly great power of discharging both kinds of electricity.

Iron and Steel in Early Times.

A late number of *Nature* gives the following interesting notes on the use of iron and steel by the ancients:—"Iron was not in common use till long after the introduction of copper. It is far more difficult to procure, because it is not met with in the native state, and the fusing point is very high. The metallurgy of iron is more complex than that of copper, and when obtained it is a more difficult metal to work. According to Zenophon the melting of iron ore was first practiced by the Chalubes, a nation dwelling near the Black Sea; hence the name Chalubus used for steel, and hence our word *Chalybeate* applied to mineral water containing iron. Steel was known to the ancients, but we do not know by what means it was prepared; it was tempered by heating to redness and plunging in cold water. According to some, kuanos mentioned by Homer was steel; but Mr. Gladstone prefers to conclude that it was bronze. Iron was known at least 1537 B. C. It was coined into money by the Lacedaemonians, and in the time of Lukouros in common use. It was used in the time of Homer for certain cutting instruments, such as woodmen's axes, and for ploughshares. Its value is shown by the fact that Achilles proposed a ball of iron as a prize for the games in honor of Patroklos.

Neither iron money nor iron implements of great antiquity have been found, because, unlike the other metals of which we have spoken above, iron rusts rapidly, and soon comparatively disappears. No remains of it have been found in Egypt, yet Herodotus tells us that iron instruments were used in building the pyramids; moreover, steel must have been employed to engrave the granite and other hard rocks, massive pillars of which are often found engraved most delicately from top to bottom with hieroglyphics. Again, the beautifully engraved Babylonian cylinders and Egyptian gems, frequently of cornelian and onyx, must have required steel tools of the finest temper. We have no record of the furnaces in which iron ore was smelted, but we know that bellows were in use in the 15th century B. C., in Egypt, and some crucibles of the same period are preserved in the Berlin Museum. They closely resemble the crucibles in use at the present day." We may add that Mr. Layard found an iron saw at Nineveh.

CARBON WATER FILTERS.—Water standing in a glass globe, the mouth of which was stopped with cotton wool, showed after some days signs of vegetable growth on its surface. The same water, filtered through a carbon filter into a globe free from air, also soon showed like signs of the existence of life. The same water after boiling remained perfectly clear for days. I therefore conclude that carbon filters are useful only in purifying water from mechanical impurities, as sand, lime, etc., but that they cannot remove the so-called germs.—*Julius Muller.*

INDIUM IN ZINC BLENDE.—Professor Cornwall, of Columbia College, N. Y., has, by means of the spectroscope, detected a notable amount of indium in various samples of zinc blende from New Hampshire and other States.

Highest and Lowest Regular Sales—No. Shares Sold—Advance and Decline—for Last 6 Days in S. F. Stock & Ex. Board.

NAMES OF COMPANIES.	Shares in ft.	FRIDAY.	SATURDAY.	MONDAY.	TUESDAY.	WEDNESDAY.	THURSDAY.	Adv.	Decl.
Adams Hill.	300	400	400	400	400	400	400		
Alamo.	300	300	300	300	300	300	300		
Alph.	300	300	300	300	300	300	300		
Amador.	2500	110	210	210	210	210	210		
Amador Tunn.	2500	110	210	210	210	210	210		
Arizona.	1500	150	150	150	150	150	150		
Belcher.	1000	100	100	100	100	100	100		
Baltimore Con.	2400	300	300	300	300	300	300		
Bowery.	100	100	100	100	100	100	100		
Butte.	100	100	100	100	100	100	100		
California.	100	100	100	100	100	100	100		
Central.	100	100	100	100	100	100	100		
Chollar.	2500	100	100	100	100	100	100		
Columbia.	100	100	100	100	100	100	100		
Crown Point.	100	100	100	100	100	100	100		
Confidence.	100	100	100	100	100	100	100		
Con. Virginia.	100	100	100	100	100	100	100		
Empire.	100	100	100	100	100	100	100		
Gold & Curry.	100	100	100	100	100	100	100		
Globe.	100	100	100	100	100	100	100		
Imperial.	100	100	100	100	100	100	100		
Independ.	100	100	100	100	100	100	100		
Interoceanic.	100	100	100	100	100	100	100		
Knickerbocker.	100	100	100	100	100	100	100		
Monitor Belmont.	100	100	100	100	100	100	100		
North Star.	100	100	100	100	100	100	100		
Ophir.	100	100	100	100	100	100	100		
Pacific.	100	100	100	100	100	100	100		
Pioche.	100	100	100	100	100	100	100		
Pioche Phoenix.	100	100	100	100	100	100	100		
Raymond & Ely.	100	100	100	100	100	100	100		
Seg. Belcher.	100	100	100	100	100	100	100		
Sierra Nevada.	100	100	100	100	100	100	100		
Summit.	100	100	100	100	100	100	100		
Swansea.	100	100	100	100	100	100	100		
Union.	100	100	100	100	100	100	100		
Utah.	100	100	100	100	100	100	100		
Washington.	100	100	100	100	100	100	100		
Yuba.	100	100	100	100	100	100	100		

Our Weekly Stock Report.

THURSDAY EVENING, May 8, 1873.

There has been nothing like the present excitement in the stock market for over a year, the season of depression which has lasted so long having at last passed by. Washoe stocks particularly are affected, Ely and Idaho stocks showing very small fluctuations. As we go to press everything is still on the rise with more buyers than sellers. The activity in the Board is so great that on Wednesday, at 12 o'clock, when at ordinary times the whole list would have been concluded, they only got to Crown Point. At 4.30 p. m., the Board had not concluded the calling of the regular list and adjourned until Thursday morning. The operations in Savage affect the whole list of Washoe stocks. The transactions in stocks which have taken place this week indicate a more plentiful supply of money in the community than was supposed to be in circulation. A large increase of orders to buy shows the confidence evinced in the state of the market. There has been very little excitement in Ely stocks at the Board as people are waiting to see which way the suits of promising mines there will go.

The rapidly improving value in some of the Comstock mines inspires confidence in that quarter. The production for the month from the Belcher mine was \$1,300,000, and that mine has declared a dividend of \$3 per share, aggregating \$332,000. This makes \$2,392,000 paid out as dividends by Belcher since the 1st of January this year. The amount of money carried over in May is \$200,000, making about \$1,000,000 carried forward.

The bullion received at the Crown Point for April up to the 7th inst. aggregates \$1,060,479.84, and about \$120,000 more is expected, making upwards of \$1,200,000 for the month. The dividend declared is \$10, or \$1,000,000 in all; the largest ever declared by any mining company. These two dividends alone will aggregate \$1,832,000, to be paid to stockholders this month. The Eureka dividend of \$2 adds 40,000 more, making \$1,872,000 altogether. The Consolidated Amador will probably pay \$1 per share or \$300,000, swelling the amount for the month of May to \$1,858,000.

Raymond and Ely, which has until lately suffered a heavy dividend, will probably not do so this month on account of legal difficulties, but consolation is found in the fact that the bullion is steadily accumulating, and a big dividend will be announced in due time. No dividend is yet announced from the Monitor-Belmont mine this month, but letters from there give encouraging prospects for the mine. After the very general and long continued depression in the stock market the present rise is doubly welcome, and is an indication of renewed confidence in mining interests throughout the coast.

The Pioche Phoenix assessment of 50 cents has been resold and a new assessment of \$1 per share amounting to \$50,000 delinquent June 16th has been levied. So far this month the following assessments have been levied: Bowery Consolidated, 50 cents, delinquent June 18th; Insurance, 26 cents, delinquent June 6th; Mint,

10 cents, delinquent June 10th; Pioche Phoenix, \$1, delinquent June 16th; Portland, 25 cents, delinquent June 7th; Utah, \$1, delinquent June 10th; Eliza, \$1, delinquent June 9th; Newton Booth Con., 50 cents, delinquent June 14th; Summit, 25 cents, delinquent June 5th.

On Friday the market showed gathering strength and prices were strong with an increase of business. Activity prevailed during the season of the Board on Saturday, and prices were pretty firm. At the close Baltimore Con. was \$2 higher; Chollar, \$5; Caledonia, \$4; Crown Point, \$1; Gould & Curry, \$1; Ophir, \$1; Overman, \$1; Savage, \$3; Seg. Belcher, \$1; Jacket, \$2; Hermes fell \$2.

On Monday the market was very active and a general advance in prices was apparent. Baltimore Con., advanced \$2.50; Belcher, \$3.50; Crown Point, \$3; Chollar, \$6; Con. Va., \$3; Caledonia, \$2; Gould & Curry, \$3; Hale & Norcross, \$2; Ophir, \$4; Overman, \$3; Savage, \$5.

Tuesday's market showed a still further advance in prices, with great activity in business, particularly for Nevada stocks. The prices of that list closed in the morning at a general advance. Alpha, \$3; Arizona, \$2; American Flat, \$2; Baltimore Con., \$1; Best and Belcher, \$3; Crown Point, \$3; Chollar, \$3; Con. Virginia, \$1; Confidence, \$1; Caledonia, \$1; Empire Mill, \$1; Gould & Curry, \$3; Hale & Norcross, \$6; Imperial, \$1; Julia, \$1; Kentuck, \$4; Knickerbocker, \$5; Ophir, \$3; Overman, \$10; Savage, \$31; Seg. Belcher, \$3; Jacket, \$1. After the morning Board there was a reaction in Savage to \$110, but in the afternoon it rallied to \$110. Raymond & Ely was \$5 higher; Hermes, \$1; Meadow Valley, \$1.

Wednesday's market still continued and the stock market was still stronger than on the previous day. Savage, which was the main feature, sold before the Board at \$144; it opened at the Board at \$125, and closed at \$134. At the afternoon Board an active business was done, at rising prices. The advance for the day was general in the Washoe list. Alpha rose \$4; Belcher, \$4; Caledonia, \$3; Crown Point, \$2; Con. Virginia, \$5; Confidence, \$2; Empire Mill, \$3; Imperial, \$4; Knickerbocker, \$3; Hale & Norcross, \$2; Justice, \$2; Ophir, \$2; Overman, \$5; Sierra Nevada, \$3; Savage, \$18; Yellow Jacket, \$15.

In today's market some descriptions of stock show a decline from yesterday's prices and not so much business was done at the Board. The fluctuations will be seen by reference to our Stock Table.

The following items of interest from prominent mines are collated from letters or telegrams from superintendents on file at the offices of the respective companies in this city.

Belcher. Dispatch of the 5th says there is no change in the mine. Car samples, \$157. Bullion produced during the month, \$1,300,000; profit, \$1,000,000. A dividend of \$3 per share has been declared, payable May 10th.

Dispatch of the 7th says there is no change in the mine. Car samples, \$172 per ton.

Buckeye. Letter of the 5th says there has been no change since last report. The ore producing sections continue to show finely. Ore slips for the 2d and 3d, 33 tons.

Crown Point. The amount of bullion received at the San Francisco office on the 2d was \$28,552.20; on the 3d, \$37,953.56; on the 5th, two shipments of \$23,956.61 and \$47,493.44—making this total for the April account, so far, \$1,003,703.40.

The amount of ore shipped to the mills during the past

NOTE.—In the Stock Board an assessment is delinquent thirty days from the date of levy, exclusive of that date. The dates given in this list are those of the mining offices.

ASSESSMENTS.—Stocks on the Lists of the Boards.

Company.	Location.	No. Amt. Levied.	Delinq't.	Sale.	Secretary.	Place of Business.
Bellevue M. Co.	Placer Co., Cal.	50	April 14	May 19	T. F. Cronise.	438 California st.
Baltimore Con. M. Co.	Nevada.	2	May 31	May 6	O. T. Bagley.	401 California st.
Bowery Con. M. Co.	Ely District.	3	May 5	May 16	C. E. Elliott.	419 California st.
Columbia M. & M. Co.	Nevada.	10	May 13	May 19	H. B. Minor.	411 California st.
Confidence Silver M. Co.	Nevada.	10	May 13	May 19	D. T. Bagley.	401 California st.
Con. Virginia M. Co.	Nevada.	10	May 13	May 19	C. F. Balcom.	420 Montgomery st.
Empire M. Co.	Washoe.	12	May 10	May 17	G. R. Spinney.	230 California st.
Golden Chariot Mining Co.	Idaho.	8	May 20	May 26	L. K. Kegan.	401 California st.
Gould & Curry.	Washoe.	17	May 10	May 17	J. A. Durbow.	March, Exobit
Ida Elmore M. Co.	Idaho.	9	May 20	May 26	Wm. Willis.	419 California st.
Imperial S. M. Co.	Cal.	16	May 10	May 12	W. E. Dean.	419 California st.
Independent Gold Mining Co.	Cal.	3	May 10	May 12	G. T. Grimes.	200 Montgomery st.
Insurance M. Co.	Washoe.	1	May 25	May 5	H. Landere.	507 Montgomery st.
Jackman M. Co.	Nevada.	5	May 10	May 26	H. O. Kibbe.	419 California st.
Knickerbocker M. Co.	Nevada.	5	May 10	May 26	H. O. Kibbe.	419 California st.
Mehogany G. and S. M. Co.	Idaho.	8	May 20	May 26	H. O. Kibbe.	419 California st.
Monitor Belmont.	Washoe.	10	May 10	May 10	E. McFaddin.	1 Exchange Bldg
Mint G. M. Co.	Washoe.	10	May 10	May 10	Wm. Willis.	419 California st.
Newark S. M. Co.	Ely District.	4	May 30	May 10	D. T. Bagley.	401 California st.
New York Con. M. Co.	Nevada.	3	May 30	May 24	H. O. Kibbe.	419 California st.
Ophir S. M. Co.	Nevada.	5	May 10	May 26	D. A. Jennings.	401 California st.
Pioche Silver Mining Co.	Enreka Dist.	10	May 25	May 16	Joseph Magura.	419 California st.
Pioche Chempion M. Co.	Ely District.	2	May 10	May 17	A. Noel.	419 California st.
Pioche Phoenix M. Co.	Ely District.	3	May 10	May 17	O. K. Elliott.	419 California st.
Portland S. M. Co.	Ely District.	1	May 10	May 17	J. M. Huntington.	37 Merchants' Ex
Savage Mining Co.	Nevada.	9	May 10	May 5	E. B. Holmes.	1 Fireman's Fund B
Silver Peak M. Co.	Nevada.	2	May 10	May 5	H. O. Kibbe.	419 California st.
Spring Mountain Tunnel Co.	Eureka, Nev.	75	May 10	May 10	F. R. Bunker.	Montgomery Block
Union Con. M. Co.	Nevada.	2	May 18	May 10	J. M. Huntington.	37 Merchants' Ex
Utah S. M. Co.	Washoe.	1	May 10	May 10	W. E. Dean.	419 California st.
Washington & Orsola M. Co.	Ely Dist.	8	May 20	May 20	F. D. Cleary.	Merchants' Ex

Other Companies (not on the Lists of the Boards.)

Atlantic and Pacific Con. M. Co.	Cal.	4	May 26	May 30	J. A. Noel.	419 California st.
Albany M. Co.	Nevada.	14	May 20	May 20	J. O. Stranoh.	120 Front st.
Anzels Q. M. Co.	Cal.	1	May 20	May 21	Geo. Congdon.	408 California st.
Auburn G. M. Co.	Placer Co., Cal.	4	May 20	May 24	R. Wegener.	419 California st.
Cedarburg First S. Ex.	Cal.	3	May 10	May 30	J. N. Webster.	605 Montgomery st.
Edo edo Quartz M. Co.	Cal.	1	May 10	May 3	G. W. R. King.	411 California st.
Eliza M. & M. Co.	Slackton Co., Cal.	2	May 10	May 26	Wm. H. Watson.	302 Montgomery st.
Kata Buene Con. S. M. Co.	Nevada.	2	May 27	May 23	A. Noel.	419 California st.
Great Blue Gravel Range Co.	Nevada.	7	May 15	May 14	H. O. Howard.	523 Montgomery st.
Granite Tail M. Co.	El Dorado Co., Cal.	2	May 10	May 10	Wm. H. Watson.	302 Montgomery st.
Hardy Coal Mining Co.	White Pine.	1	May 20	May 12	J. C. Hardy.	338 Montgomery st.
Hays G. & S. M. Co.	Cal.	1	May 20	May 12	H. O. Howard.	332 Montgomery st.
Hermes Silver Mining Co.	El Dorado Co.	1	May 25	May 17	A. D. Carpenter.	605 Calif.
Hobbs G. M. Co.	El Dorado Co.	1	May 25	May 17	A. D. Carpenter.	605 Calif.
Ledy Easton Tunnel and M. Co.	Utah.	2	May 10	May 10	Chas. S. Healy.	35 New Merchants' Ex
Newton Booth Con.	Ely District.	3	May 10	May 10	L. Francon.	314 California st.
Occident G. and S. M. Co.	White Pine.	2	May 10	May 12	J. A. McClelland.	414 California st.
Old Providence.	Cal.	3	May 25	May 10	S. Phillips.	416 Montgomery st.
Omaha Table Mt. Co.	Cal.	1	May 10	May 10	D. Wilder.	Merchants' Ex
Opacates G. M. Co.	Cal.	1	May 10	May 10	D. A. Jennings.	401 California st.
Pioche Chempion Co.	Grass Valley.	2	May 10	May 12	A. Noel.	419 California st.
Prospect M. Co.	Nevada.	4	May 20	May 10	J. H. Peyton.	Grass Valley
Rising Star.	Nevada.	4	May 20	May 29	J. M. Huntington.	37 New Merchants' Ex
San Jose M. Co.	Whit. Cal.	2	May 10	May 10	Wm. Stuart.	113 Leidesdorff street
San Joaquin M. Co.	Cal.	2	May 10	May 10	R. F. Perry.	107 Front
Schell Creek M. Co.	Cal.	1	May 10	May 10	P. W. Van Winkle.	304 California st.
Sierra Iron Co.	Cal.	1	May 10	May 10	O. T. Pay.	606 Montgomery st.
Sierra Nevada M. Co.	Nevada.	2	May 10	May 10	M. R. Kaplan.	419 California st.
Stock Quartz M. Co.	California.	1	May 10	May 10	E. Whelan.	401 Montgomery st.
Summit M. Co.	Amador Co., Cal.	3	May 25	May 5	Geo. Davidson.	347 Montgomery st.
Swansea Mining Company.	El Dorado.	2	May 20	May 20	E. P. Gray.	425 Kearny st.
Washington M. Co.	Mariposa Co., Cal.	4	May 20	May 13	T. B. Wingard.	327 Montgomery st.

MEETINGS TO BE HELD.

Name of Co.	Location.	Secretary.	Office in S. F.	Meeting.	Date.
Adams Hill Con. M. Co.	Enreka Dist.	W. W. Taylor.	419 California st.	Annual.	May 19
California Water Co.	El Dorado Co.	J. F. Nesmith.	315 California st.	Annual.	May 14
Columbia Smelting and M. Co.	Nevada.	J. W. Trip.	408 California st.	Special.	Apr. 30
Dardanelle.	Cal.	Called by Trustees.	411 California st.	Special.	May 24
Excelsior Gravel M. Co.	Cal.	A. W. Van Winkle.	304 California st.	Annual.	May 13
Heckerling G. & S. M. Co.	Cal.	Lois Terme.	510 Jackson st.	Annual.	May 29
Independent G. M. Co.	Battle Co., Cal.	G. T. Grimes.	402 Montgomery st.	Annual.	May 14
Imperial S. M. Co.	Ely District.	R. E. Brenster.	312 California st.	Special.	May 13
L. A. Grange M. Co.	White Pine.	D. A. Jennings.	401 California st.	Annual.	May 8
O. H. Treasure Co.	Cal.	J. A. Noel.	419 California st.	Annual.	May 10
Pacific Borax Co.	Nevada.	S. F. Fetter.	507 Montgomery st.	Adjourned Annual.	May 19
Spring Mt. Tunnel Co.	Cal.	J. M. Huntington.	Merchants' Ex.	Annual.	May 13
South Chariot M. Co.	Utah.	J. L. King.	411 California st.	Special.	May 19
Yuba Tunnel G. M. Co.	Nevada.	R. W. Taylor.	414 California st.	Annual.	May 10
Yuba Tunnel G. M. Co.	Nevada.	J. A. Ray.	North San Juan.	Annual.	May 19

LATEST DIVIDENDS.

Name of Co.	Location.	Secretary.	Office in S. F.	Amount.	Payable.
Belcher M. Co.	Washoe.	H. O. Kibbe.	419 California st.	8 00	May 10
Black Diamond Coal Co.	California.	P. B. Cornwall.	Or. Harriett & Spear.	5 per cent	Mar. 10
Cedarburg G. M. Co.	California.	D. M. Bokse.	420 Montgomery st.	50c	Feb. 8
Con. Virginia M. Co.	Cal.	F. E. Lehman.	402 Montgomery st.	10 00	Apr. 1
Crown Point G. & S. M. Co.	Washoe.	C. E. Elliott.	419 California st.	10 00	May 13
Diana M. Co.	Cal.	N. U. Fasset.	220 Clay St.	1 00	Jan. 20
Eastport Copper Coal.	Oregon.	J. L. Cool.	Merchants' Ex.	5 00	Apr. 11
Empire Mill M. Co.	Grass Valley.	R. Wegener.	414 California st.	2 annu.	May 7
Mahogany G. & S. M. Co.	Idaho.	T. J. Owens.	402 Montgomery st.	1 50	Aug. 7
Meadow Valley M. Co.	Ely District.	T. W. Colburn.	409 California st.	1 00	Jan. 15
Monitor-Belmont M. Co.	Nevada.	E. B. Holmes.	411 California st.	2 annu.	Mar. 15
Pioche M. Co.	Ely Dist., Nev.	C. E. Elliott.	419 California st.	1 00	Aug. 10
Providence G. & S. M. Co.	Cal.	J. M. Huntington.	Merchants' Ex.	1 00	Nov. 11
Raymond & Ely M. Co.	Ely Dist., Nev.	A. J. Mondler.	419 California st.	5 00	Feb. 10

week was 3,325 tons 861 pounds; sixty-five per cent. of the assay value, \$275,736.49.

Dispatch of the 6th says that since the last report the crosscut from the fifth floor of the 1500-foot level has much improved. The whole face will now average \$30 per ton. The breasts and floors are all looking well as ever, and everything is looking well in and about the mine.

Dispatch of the 7th says the crosscut from the fifth floor of the 1500-foot level is in very rich ore. The mine looks well at all the prospecting points.

Bullion received at the office on the 7th, \$56,775.94, making the total for the month of April, so far, \$1,060,479.84.

Eureka Con. Letter of the 4th says the mine generally is looking well. Ore from the third level raises holds out strong, and of a good grade. Two

The Mining and Metallurgical Laboratories of the Massachusetts Institute of Technology.

By PROF. ROBERT H. RICHARDS.*

Of the several professions—the chemist, the civil engineer, the mining engineer, the mechanical engineer—the courses of instruction, as arranged at the scientific schools, differ considerably as to the amount of practical information which the student is able to gain. The analytical chemist has facility for a very thorough review of the processes which he will be called upon to perform. The student in civil engineering by his field practice learns the use of his tools and the art of taking field-notes. The mechanical engineering student is in the vicinity of machine-shops, which he can visit, and at which he can work. The student in mining engineering has no such advantages. The mines are at a distance, and the railroad fare to get to them is oftentimes an insuperable difficulty.

The aim of these laboratories is essentially to give to the student in mining and metallurgy a chance to study on a small scale the practical parts of his profession. We cannot, in a small laboratory, build a mine to timber, to work and to survey; we cannot make artificial quicksands and other impediments to mining. In short, we cannot study exploration; but we can study the mechanical preparation and the subsequent smelting of ores. Before presenting the plan of these laboratories it may be interesting to indicate the progress of the idea from its beginning.

During the summer of 1870 President Runkle visited the mines of Colorado, and while there, conceived the idea of making an expedition with the mining students to some of the western mining regions. He talked over the scheme with many railroad and mining men, and everywhere received encouragement. In the summer of 1871 the Institute party visited the mines of Colorado, and spent six weeks in taking notes of them. President Runkle here conceived the idea of building up a mining and metallurgical laboratory; and by the aid of Booth & Co., of San Francisco, a stamp mill was obtained, with the Washoe silver-working apparatus. During the year 1872 this metallurgical laboratory was brought to its present state of advancement by Prof. Ordway.

These two laboratories are intended to give students an opportunity to work, on a small scale, with all the mining and smelting apparatus which can be used to advantage in a laboratory. And this apparatus has been chosen, with this view to illustrate, as far as possible, the principles of all machines used in mining.

The mining laboratory now contains a fifteen horse-power engine; a Blake crusher; a stamp mill; a Washoe pan, settler and concentrator; a Rittinger automatic shaking table; a little hand jiggr; a rotary pulverizer; and a fan-blower. The metallurgical laboratory contains a blast furnace; a roasting and a smelting reverberatory furnace; a cupelling furnace; assay furnaces and a forge. The laboratory is equipped for easy blast furnace experiments, such as the smelting of copper and lead ores, for roasting operations on gold, silver, lead, copper, and antimony ores, and for the "Freiberg process" for silver.

A student receives an ore for examination, and in the presence of his instructor selects specimens containing all its characteristic minerals, which he determines, and then selects the method of treatment. Specimens are saved; the ore is crushed and sampled; assays are made, to determine its value. The ore undergoes the treatment which was chosen. Actual results are compared with the assay value of the ore, and, wherever practicable, the amount of fuel, power, labor and water consumed is noted.

But few experiments have as yet been tried, since these laboratories are scarcely yet completed. A gold ore from Acworth, Georgia, yielded the following results when treated by battery amalgamation:

Ore taken.....	176 lb.
Gold on plate.....	3.07 grains.
Gold panned from Battery.....	13.4 grains.
Rate of gold in the ore.....	\$1.76 per ton.
" " tailings.....	1.57 " "
Percentage saved.....	83 per cent.

Apparatus for iron working is not yet represented in the laboratories, partly for lack of space, and partly because we have not yet decided what furnaces could be most usefully employed in a laboratory. A pair of crushing rolls is now in course of manufacture.

The mining schools of Prussia are owned and controlled by the Government, as is the case also with most of the mines and metallurgical establishments. In consequence, students have great facilities afforded them for acquiring practical information. In this country no such bond of union exists between the mines and the schools. The schools must here depend on the generosity and sympathy of the public, and, to obtain such help, they must in some way reciprocate it.

It is fully expected, that, by making students do systematic and careful work, results will be obtained which will be of such value to the donors of the ores that they will feel more than repaid for sending them. If this expectation fails, the alternative always remains, that ores can be bought and shipped by the school.

The mutual interchange of ideas, between the instructors of the Institute and the miners, which will grow out of such work, is regarded

as no mean part of the value of this laboratory to this school and to the public.

With regard to working ores for outside interests only, results being returned promptly, and a fee received in compensation for work done, I can only say that we have not found enough this school-year to make any promises whatever. I expect to be able to do prompt work in future years.

With reference to the students' work, the suggestion has been made that we should hold a tournament, as it were, for a month, keeping all mining students engaged at work in their regular shifts; that we should run all the apparatus during the month; have our regular break-downs, stoppages and patchings up, and settle up accounts at the end of the month, making such assays and analyses as are needed.

* A paper read before the American Institute of Mining Engineers, Boston, Feb. 19, 1873, and published in the *Engineering and Mining Journal*.

Original Potato.

In our illustration we present a branch of this plant and the tubers of the original, native potato, both of this natural size. They are found growing in abundance among the mountains of South America and in that part of Mexico between Fort Wingate and Fort Defiance. The Navajo Indians inhabit this section and this



NATIVE POTATO (*Solanum fendleri*.)

native potato is one of their chief articles of diet in winter.

By giving this indigenous potato good cultivation in good soil, the tubers which are from one-half inch to an inch in diameter, are largely increased in size, so that the third year's product from the native root, are as large as hen's eggs; and by continuing the process of reproduction always from the larger tubers, the full-sized potato is obtained and often of good quality; whilst the crossing of this, with some of the old improved varieties is supposed to give a renewed vigor to this plant and certainly a largely improved product over the yield from the original variety.

SALTING.—The Salt Sake *Tribune*, publishes a card signed by J. F. Harrison of New Orleans, charging four persons with swindling him and a New Orleans company, by the sale of a salted mine, for \$165,000. The card denounces the men for villains, who have robbed the widow and orphan, and deserve the hangman's rope, as cowards too mean to earn an honest living.

UTAH RAILROADS.—The Jordan and Wahsatch narrow-gauge road started its first train on Monday, everything moving smoothly.

About Postage.

By the terms of recent legislation, the franking privilege is abolished, and it is provided that, "All laws, and parts of laws, permitting the transmission by mail of any free matter whatever, be, and the same are hereby, repealed, from and after June 30, 1873." This cuts off the free exchange of newspapers between publishers, and the free circulation of papers within the counties of publication.

No changes in the rates of postage have been made, and, consequently postage charges will be as follows:

Letters.

To all parts of the United States, three cents per half-ounce.

Papers, Etc.

Pamphlets, occasional publications, transient newspapers, magazines, handbills, posters, unsealed circulars, prospectuses, book manuscripts, proof sheets, maps, prints, engravings, blanks, flexible patterns, sample-cards, photographic paper, letter envelopes, postal envelopes and wrappers, cards, plain and ornamental paper, photographic representations of different types, seeds, cuttings, bulbs, roots, and scions, can be transmitted through the mail, at the rate of one cent for each two ounces or fraction thereof.

Books, two cents for each two ounces or fraction thereof. Samples of merchandise, metals, ores, and mineralogical specimens can pass through the mail in packages not exceeding twelve ounces, at the rate of two cents for each ounce or fraction thereof; to be left

ceived in the office with stamps cut from stamped envelopes, or with such postage stamps as were in use prior to 1861, or with revenue stamps on them, are treated as "unmailable" and sent to the Dead Letter Office. Letters which have not been delivered can be forwarded, without additional charge, upon a written request.

Letters once delivered from a post office cannot be re-mailed without additional charge. Departmental postage after June 30, 1873, will be prepaid by special stamps, prepared and furnished by the Post Office Department.

Silver in Michigan.

It is with pleasure that we make the important announcement that the silver vein discovered last fall in Iron River has been explored and opened on Section nineteen on land belonging to the Ontonagon Silver Mining Company, a Co organized under the mining laws of this State; the stockholders being principally Marquette men, whom we congratulate upon the discovery and commend their pluck and energy in prosecuting the work under the many disadvantages they have had to contend with.

Work was commenced on the ground about four weeks since, in a section of country where no person was living. All their supplies, tools and material have had to be drawn from Ontonagon by dog trains, and the men have been compelled to camp in a temporary brush camp. Add to this the inclement weather we have had, and the fact that the ground was covered with four feet of snow and our readers can readily see that the company have had more than ordinary difficulties to contend with. However, with a firm faith that the vein would continue its course as shown in Iron River, and be found on their land, they have pushed the work with commendable vigor until they attained the object of their search. The vein opened is about twenty rods south of the east and west line, and near the north and south lines of the northwest quarter of Section nineteen, Town fifty-ones, north of Range forty-one west. Its dip is the same as in the out-crop in Iron River—north, or a little east of north—and occupying the same geological position, at the junction of the slate and sandstone, the slate for the north and the sandstone for the south wall. The vein is about seventeen or eighteen inches wide and rich in native silver and silver ore, the specimens obtained being in the estimation of many richer in silver than those obtained from the surface of the vein in Iron River. One fact is evident, that it carries more native silver and less silver ore where it is opened on Sec. 19 than it does in Iron River, but that may be accounted for from the fact that where the vein was opened on Iron River it was subjected to atmospheric action and disintegration and decomposition by the waters of the river running over it.

The fact of its being opened some fifty rods off from the river would seem to leave no doubt of its being a continuous vein, and we presume the owners of the land adjoining will not be slow in following up the exploration and opening on the vein in other places. The pit has been enlarged and properly timbered up so that the skeptical can see for themselves. A force of men are now employed in clearing up this land, getting out timber, erecting houses, and making preparations for active work. We are glad to learn that it is the intention of the company to push the work as fast as possible. They have faith that the vein is a valuable one and will be highly remunerative. As soon as navigation opens a sufficient amount of the vein will be taken out and submitted to several treatments for the extraction of silver on a large scale, and as soon as it is ascertained which is the best method their plan of work will be decided on.

We have contended from the first this discovery was a valuable one and shall look with some interest for further developments in this pioneer enterprise in the newly-discovered silver district in Ontonagon. We have confidence in the men that stand at the helm, and we hope that the snags and pitfalls which have proved the ruin of so many enterprises started heretofore, by extravagance and imprudent management, will be avoided by them.—*Ontonagon Miner*.

THE SAUCILITO RAILROAD.—Of actual novelty in the work done on the North Pacific Coast Narrow-Gauge Railroad, we have little to note this week. On the Saucilito side the grading, cutting and filling is going forward with energy. A large force is now at work, the number of laborers having been increased to one hundred. During the week a mild attack of strike afflicted the men as to the date when they should receive their stipends. A few hours effected a compromise satisfactory to all parties. On the Strawberry Point side the surveyors have finished their work from this summit to near Collins' place, and have gone forward. This party is under the charge of Mr. Robert Finley. On this side blasting, filling and cutting is being done with as great, if not greater, energy than on this other side. The whole line presents a pleasing and busy scene. Workmen are going backward and forward constantly. Here the force of laborers is constantly on the increase. At the tunnels at White's Hill work has been delayed somewhat by the reason of a land-slide over the face of the large tunnel which took place during the week. However, the greater part of this has been removed, and the work into this tunnel is again going forward.—*Saucilito Herald*.

RICH GOLD discoveries are reported in the Osceola district, about 65 miles north from Pioche.

Regular Publications.

Newspapers sent by mail must be prepaid by stamps, unless "regularly issued and sent to regular subscribers" by publishers or newsdealers, when the following rates are charged, payable quarterly in advance, either at the mailing or at the delivery office:

Dailies.....	35 cents.
Six times a week.....	30 cents.
Tri-weeklies.....	16 cents.
Semi-weeklies.....	10 cents.
Weeklies.....	5 cents.
Semi-monthly, not over 4 ozs.....	6 cents.
Monthly, not over 4 ozs.....	3 cents.
Quarterlies, not over 4 ozs.....	1 cent.

Newspapers and circulars dropped into the office for local delivery must be prepaid at the rate of one cent for two ounces, and an additional rate for every additional two ounces or fraction thereof; and periodicals weighing more than two ounces are subject to two cents, prepaid at all letter-carrier offices.

The postage on regular papers, etc., must be paid in advance, either at the place of delivery, to the carrier, or at the office, otherwise they will be chargeable at transient rates.

Book Manuscript.

Book manuscript passing between authors and publishers requires prepayment at the rate of one cent for each two ounces or fraction thereof.

Manuscript intended for publication in newspapers, magazines, pamphlets, etc., is subject to letter rates of postage.

General Rules.

Full prepayment by stamps required on all transient printed matter, foreign and domestic. All letters not prepaid by stamps, all such as are re-

USEFUL INFORMATION.

PAINTED ZINC.—A difficulty is often experienced in causing oil colors to adhere to sheet zinc. Boettger recommends the employment of a mordant, so to speak, of the following composition; one part of chloride of copper, one nitrate of copper and one of sal ammoniac are to be dissolved in sixty-four parts of water; to which solution is to be added one part of commercial hydrochloric acid. The sheets of zinc are to be brushed over with this liquid, which gives them a deep black color; in the course of from twelve to twenty-four hours they become dry, and to their now dirty gray surface a coat of any oil color will firmly adhere. Some sheets of zinc prepared in this way and afterwards painted have been found to entirely withstand all the atmospheric changes of winter and summer.

COLORS CANDIES.—WHAT THEY ARE MADE OF. Some months since, a great variety of the candies sold in New York were analyzed by Dr. Endemann, assistant chemist to the health department of that city, and reported in the *American Chemist*. Reds were either carmine or aniline red (both harmless). Blues were either ultramarine or Prussian blue (also harmless). Yellows were either saffron, chromate of lime, chromate of baryta, chromate of lead, gamboge, or vegetable colors. Of ten samples, five were coloured with chromate of lead, and one with gamboge (both poisonous). Greens were harmless, so far as examined. Starch sugar is a common constituent of some kinds of candy, and starch is often substituted for gum arabic. In two cases gypsum was found, three and six per cent; no other inorganic adulterations were detected.

ARTIFICIAL TORTOISE SHELL.—This substance may be made by melting gelatine with various metallic salts. According to the *Art Journal*, the appearance of tortoise shell may be given to horn by brushing it over with a paste made of two parts of lime, one part of litharge, and a little soda lye, which is allowed to dry. This is the same as the Indian hair dye, and acts by forming sulphuret of lead with the sulphur contained in the albumen of the horn, producing dark spots, which contrast with the brighter color of the horn. One of the most extensive comb manufactories in the world is in Aberdeen, where there are thirty-six furnaces on the works for preparing horns and tortoise shell for the combs, and no less than 120 iron screw presses worked by steam.

THE COMMON HOUSE CRICKET has the notable peculiarity of possessing both inositive and molar teeth. This enables the insect to destroy roaches much larger than itself, and to eat through very tough substances. Crickets have been known to spoil the soles of boots left within their reach over night, and they will frequently make holes in wet stockings, under like circumstances. The power of chirping belongs only to the males. These are provided with what corresponds to a little drum or tambourine, formed by the horny or parchment-like substance of the short upper wings. These wings have roughened edges, and, being rubbed with a vibratory movement, upon the integument forming the drum, produce the familiar "creek, creek" of the insect.

VENETIAN BLINDS OF COLORED GLASS.—A good idea has been put into form in an invention, patented by Mr. Peattie, of Rankellow street, Edinburgh. It is simply the substitution, with several little improvements, of colored and ground glass instead of wood, in the ordinary Venetian long and short blinds for windows. The glass is bound with brass to preserve it; and heavy blinds are simply wound up and down with something like a clock-key. The play of colors, it is easy to see, may thus be managed so as to give beautiful effects. Outside at night and inside by day, windows will look as if they were illuminated; and a city seen from the streets of a evening, under such circumstances, would have quite a gay and novel effect.

ANCIENT RELICS.—We are told, says the *Pi-ocche Record*, that a number of additional relics of a bygone civilization have been found between here and Bullionville. We have in our possession a piece of the pottery, which is said to be exactly like similar fragments found in Arizona and New Mexico. It is different from anything in that line we ever saw, but looks more like old-fashioned stoneware than anything else we can think of. The coloring must be of metallic origin, for it is a deep black, and has not faded in the slightest degree through the probable centuries that the fragments have been exposed to storm and sun.

BRONZING AND VARNISHING PLASTER FIGURES. These should be sized first, and painted with color according to the colored bronze required, as red, white, green, yellow, black, etc. Before the colors are thoroughly dry, that is when they feel "tacky," the prominent parts should be dabbed with bronze powder and a piece of ohamois leather. Varnish afterwards with some quick drying varnish.

IMPORTING PULP INSTEAD OF RAGS FOR PAPER. A paper manufacturer of Lee, Mass., has accepted an engagement to go out to Yokohama, Japan, to build and superintend a paper pulp mill. The pulp will be bleached and shipped in bales to this country.

THE HEART AND THE BRAIN.—For thousands of years, the hearts of animals had been beating before it was discovered that the purpose of the continuous action of that organ was to bring the supplies required for interstitial repair to the remotest members of the animal body, and at the same time to carry off the waste which had been replaced by fresh material. For thousands of years, human hearts had been beating, and, misled by superficial observation, the heart was supposed to be the seat of thought and passion, the center of good and evil, devotion and love; and it was even compared by poets to an altar on which flames were burning, etc.

But modern biologists have changed all this. The human heart is no longer the seat of the noble feelings of generosity, charity and of love; all these functions have been transferred to the brain, while the heart has been degraded to a simple hydraulic apparatus, in fact, to a machine to all intents equivalent to a pump.

ROLLING MILL NOTES.—It is estimated that one-tenth of the entire population of the United States is dependent for support upon the production and manufacture of iron. The value of the metal annually manufactured is \$900,000,000, and 940,000 workmen are employed in the industry, the aggregate of whose wages reaches \$600,000,000. There has been a vast increase of furnace capacity and additional machinery put in by our rolling mills during the past eight or ten months, and there is every prospect of still further growth.

TEMPERING SAWS.—Take a piece of iron plate sufficiently large to protect the whole surface of the saw; place it upon some bricks, or place it over a furnace, rub your saw with some clean tallow, and place it upon the plate with a good fire under it. It will soon begin to smoke. Take a lighted stick or lath, and apply to the saw; if it takes fire take it off and plunge it into either some ashes or a bed of sawdust, and let it cool by itself. If not soft enough, proceed as before, but let it burn until it burns out; then take off and plunge as before.

WAX.—According to Wagner, Corsica produces the largest quantity of wax of all the countries of Europe, if not of the world. In ancient times, as well as in medieval times, the inhabitants paid their taxes in wax, and supplied 200,000 lbs. annually. Since wax is to honey, in quantity as one to fifteen, the Corsicans must have gathered each year 3,000,000 lbs. of honey.

TO MEND CHINA, take a thick solution of gum arabic in water, and stir into it plaster of Paris, until the mixture is of a proper consistency. Apply with a brush to the fractured edges of the china, and stick them together. In three days the articles cannot be broken in the same place. The whiteness of the cement renders it doubly valuable.

GOOD HEALTH.

The Noise of Children.

There is too much fussing about the noise of children, consequent upon too little knowledge of the requirements of youth in its effervescent state. If growth and health are considered in their true bearings, children cannot make too much noise. The school-mistress who enforces silence on her pupils is committing, unintentionally, of course, an offence against reason, worthy only of a convent. Every burst of laughter, every shout, nay, every moderate fit of crying conduces to health, by rapidly filling and emptying the lungs, and changing the blood more rapidly from black to red—that is, from death to life. Andrew Combe is a great authority in such matters as these, and he tells a story of a great charity school, where the pupils were forced to be so silent that a large portion of them fell ill. Without doubt this is one good reason why children of delicate constitutions cannot go through our public schools without breaking down. They are kept too still. Often too, teachers are disposed to insist on a posture so erect as to be absolutely injurious; for the body has more parts than one, and while to sit upright is good for the chest, it is, if long continued, an intense strain on the spine. The truth is, children should not be subject to monotony of any kind. They should speak and be silent, sit erect and loll, very much as nature inclines grown people to do. It is time that more attention is paid to the Kindergarten system in schools, and less to the State's prison one so generally in vogue.—*Ex.*

DUST AND BREATHING.—It may be interesting to persons who suffer from the direct effects of the dust, or who are necessarily exposed to the night air in places where there may be malaria, to know that a respirator of clean cotton wool, packed moderately close, sifts the air, and makes it perfectly pure. It is believed that even the penetrating malaria of vegetable decay is excluded by such a sieve. The construction of the respirator is of no importance; the only thing to secure is that the air passes through the cotton before it is breathed. Such an instrument, if it is only a small roll of cotton folded in a handkerchief and held over the nostrils, will afford essential relief to every one who finds the dust of the streets or railway cars irritating to the throat and lungs.

NATURAL DURATION OF LIFE.—According to Prof. Faraday, the crime of suicide is very common in this age of the world, for he estimates that all who die under one hundred years of age may be charged with self murder; that Providence, having originally intended man to live a century, would allow him to arrive at that advanced period if he did not kill himself by eating unwholesome food, allowing himself to be annoyed by trifles; giving license to passions and exposing himself to accidents.

Flourine advanced the theory that the duration of life is measured by the time of growth. When once the bones and epiphysis are united the body grows no more, and it is at twenty years this union is effected in man. The natural termination of life is five removes from the several points. Man, being twenty years in growing lives—or should—five times twenty years; the camel is eight years in growing, and lives five times eight years; the horse is five years in growing, and lives twenty-five years; and so with other animals.

LIGHT.—The more light admitted to apartments, the better for those who occupy them. Light is as necessary to sound health as it is to vegetable life. Exclude it from plants, and the consequences are disastrous. They cannot be perfected without its villifying influence. It is a fearful mistake to curtain and blind windows so closely for fear of injuring the furniture, by exposure to the sun's rays; rooms positively gather elements in darkness, which engender disease. Let in the light often, and fresh air too, or suffer the penalty of aches and pains, and long doctor's bills, which might have been avoided.

BREATHING THROUGH THE NOSTRILS.—When a respirator is not at hand or cannot be conveniently obtained, a great advantage may be gained by breathing through the nostrils. When breathing air that is dusty, or ill-smelling, or otherwise impure, draw the breath slowly through the nostrils. In this way the dust or other impurities are in part arrested in the moist and narrow nasal passages, and are prevented from being thrown upon the lungs. When we breathe through the mouth, they are carried more directly thither. Many would lengthen their lives by resolutely breathing through the nostrils.

PINE LEAVES are largely utilized in Europe. They are converted into a kind of wool or wadding, which is used for upholstery instead of hair. A kind of flannel is also made from this fibre, which is said to be very superior for many hygienic uses, as for rheumatism and skin disease. Vests, drawers, loose shirts, etc., are also made. In the process of manufacture an ethereal oil is also obtained, very useful as a solvent, and as a curative agent. Gas is also made from the refuse and used for lighting the manufactories, or the entire refuse may be pressed into the form of bricks, when it becomes a most excellent substitute for coal.

FLOOR WAX.—Nessler gives the following formula for the preparation of floor wax: Take 2 ounces of pearl ash, and 10 ounces of wax, and about half a pint of water are heated to boiling in a dish, which is frequently agitated, until a thick fluid mass is formed, from which, upon removal from the fire, no watery liquid separates out. Boiling water is now cautiously added to the mass, until no watery drops are distinguishable. The dish is again set on the fire, but its contents are not allowed to boil, otherwise myricin would separate out, 8 or 9 pints of water being added, little by little, with constant stirring. Coloring matter may be added, if desired.

HOW TO MAKE CHEAP FRAMES.—Cut strips of stiff pasteboard about an inch wide the desired length, clip the ends to a point, and cover with any nice black cloth like broadcloth or fine cassimere, lap the ends at the corners of the frames and fasten with a white or gilt button. Bind your picture and glass together with strips of gummed paper and glue on to the frame. Hang against a white wall. Bronzed paper which can be bought for eight cents a sheet, may be used instead of cloth, in which case a short strip across the corners of the frame is a great addition to its comeliness.

NEW ANESTHETICS.—Two new anesthetics are announced, each of which is claimed to be safer than the agents usually employed. The first consists of the compound radical ethyl combined with bichloride of methylene. It has been very successfully used in dental and ophthalmic cases. The other anesthetic is the lightest of all known ethers, its specific gravity being about one-half that of water. At the temperature of the human body it boils violently. This, too, has been tried, with gratifying results.

WHY DO DOGS BARK?—Wild dogs, we are told, never bark; they howl. There are numerous troops of wild dogs in South America. Two of these that were carried to England could never bark, but continued to utter their habitual howl. But a younger one of the same species learned to bark. Many years ago dogs were left by the Spaniards in the Island of Juan Fernandez, for the purpose of exterminating the goats. In a few years all barking had ceased among them. It has been suggested that barking originated in the attempt to imitate the human voice.

DOMESTIC ECONOMY.

The Old-Fashioned Bake-Kettle.

When cooking stoves came in, the bake-kettle, or covered skillet, went out, and with it went a large part of what was good in our American cookery. How many of your readers ever saw a bake-kettle? Probably only those who enjoy the blessing of a wood fire to cook by. Just send an artist down to the back woods of Maine or away "out west," and have a drawing made of this most capital kitchen utensil. "Pioneers will know what I mean without a drawing. [The bake-kettle was in quite common use among the early California Pioneers, especially among those who crossed the Plains; but it seems to have gone quite out of use even here. Ed.—PRESS.] It is a shallow kettle with a lid, which has a turned up edge, and upon which coals are placed; and the thing to be cooked is "between two fires." Those who are roughing it in log cabins or in camp, know what a useful thing it is. In it the bread is baked, meat roasted or fried, coffee browned, dish-water heated—in short it is one thing handy to have in the house.

I say, much good cooking disappeared with the bake-kettle. It allowed food to be cooked as it seldom is by the stove—long-continued, slow cooking, with all the juices and flavors kept in. Were there ever such chicken and veal pies as our mothers used to make in the bake-kettle? We have now-a-days what is called roast veal—half burned and wholly spoiled in the stove oven. But stuff a knuckle of veal and put it in the bake-kettle and let it "sizzle with fire above and below for three or four hours. It cooks quietly and slowly, all the moisture is retained, and comes out not only a delicious, but a digestible morsel.

The French who, say what you will, bring more skill and common sense to the subject of cooking than all the rest of the world, *braise* a certain class of dishes, and they have for the purpose a *braisier*, or braising-pan, which is really only the old bake-kettle Frenchified. Ducks, pigeons, and fowls, even if tough, may be admirably cooked in the bake-kettle. Our people have much to learn about the advantages of slow and long continued cooking—a treatment which is hardly practicable in a stove oven, as that dries as well as cooks. The "modern improvements" in the way of stoves and ranges have resulted in a deteriorated cookery. Let us go back to the days of our grandmothers so far as to restore the bake-kettle to the kitchen—or, if it will be fancied better, we will call it a "*braisier*."—*Am. Agriculturist*.

REMOVING TAR SPOTS.—The old remedy for removing tar is butter; tar is soluble in fat, and especially in butter; when this is left on the tar spot for some time, both butter and tar are easily washed out by a sponge, with soap and water. It is the same with resinous wagon grease. Recently Dr. Briker announced that he had discovered that a creamy mixture of powdered extract of liquorice, with oil of aniseed, will easily dissolve tar, resin, pitch, Venice turpentine, etc. It is afterward washed out with soap and warm water.

BOGUS LARD.—An Ohio paper states that some of the articles of Commerce sold as lard is really corn meal lard. The process of manufacture is to melt the lard and then add the meal, stirring the mixture well together. When meal is sixty cents a bushel and lard twelve and a half cents a pound, it is evident that the profits to the manufacturer must be immense. The Yankee wooden mntnngs and basswood hams compare favorably with this specimen of rascality.

An excellent washing fluid may thus be made: Three tablespoonfuls of soda, the same quantity of dissolved camphor (the same as kept for family use), to a quart of soft water; bottle it up and shake it well before using. For a large washing take four tablespoonfuls of the fluid to a pint of soap, make a warm suds, and soak the clothes half an hour; then make another suds, using the same quantity of soap and fluid and boil them just fifteen minutes, then rinse in two waters.

HOW TO BAKE AN APPLE.—To bake an apple perfectly can only be done by giving it time, keeping it under heat—steady at that—for from four to six hours, depending upon the size and quality of the fruit. It requires this length of time to reduce it to a fine pulp and destroy all rawness. The flavor is changed and improved, making, if the Spitzenburg or some other good fruit, one of the choicest and simplest of dishes. The point in baking is to give all the heat that can be born without bursting the skin, thus retaining the moisture.

TO MAKE COCOANUT CANDY.—Rasp very fine a sound, fresh coconut, spread it on a dish and let it dry naturally for three days. Four ounces will be sufficient for a pound of sugar for most tastes, but more can be used at pleasure. Boil the sugar, and when it begins to be very thick and white, strew in the nut; stir and mix it well, and do not quit it for an instant until it is finished. Keep the pan a little above the fire to prevent the nut from burning.

REMOVING IRON RUST.—Put one-half teaspoonful oxalic acid to one-half teacup of water, and apply it to iron rust, fruit and other stains. Exposure to the sun will remove them.



W. B. EWER.....SENIOR EDITOR

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Saturday Morning, May 10, 1873.
San Francisco:

Legal Tender Rates.—S. F., Thurs., May 9.—buying 88; selling 86½.

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MINING DECISION.—The Commissioner of the General Land Office has decided the following mineral land cases: W. F. Anderson, of Austin, Nevada, applied for a patent for eight hundred feet of the Hidden Treasure lode in White Pine mining district. C. E. De Long, minister to Japan, and others, filed an adverse claim to the same property, alleging it to be part of the Edgar lode. The Commissioner rejects the adverse claim, because it is not clearly shown either that the two lodes conflict or are identical.

John Moore and others applied for a patent for fourteen hundred feet of the Wandering Boy lode, in Little Cottonwood District, Utah, and Thomas H. Bates filed an adverse claim, alleging it to be part of the Porcupine mine. The Commissioner rejects the adverse claim for the same reason as above.

CHEROKEE FLAT MINES.—The Spring Valley Canal and Mining Co., at Cherokee Flat, shipped on the 7th inst., a single gold bar, weighing 81 lbs., valued at \$24,000, and on April 20 one of 91 lbs., valued at \$26,000. These are the result of one month's run in their hydraulic claims, and are the largest gold bars ever made in California.

GOLD SANDS AGAIN.—The Gold Bluff Submarine Mining Company, composed of New York parties, has chartered the steamer *Monterey*, put some gold-raising machinery, with all the latest improvements on board of her, for the purpose of getting up the gold sands of the northern coast.

THE KEYSTONE mine decision which we published last week, is to be appealed to the courts. The Rose party are of course dissatisfied and announce their determination to take the case to the Supreme Court of the United States.

"Black Sand" Mines.

Considerable interest has been manifested by the public of late with regard to the gold sands on the Oregon Coast, and several expeditions have been organized for the purpose of raising these sands from the bottom of the ocean, and obtaining the gold which is supposed to have collected in large quantities. The impression prevails to a certain extent that the existence of these sands is confined to the ocean beach, but such is not the case. A number of claims are located within a few miles of the ocean which have been worked for several years. The surface of the country for some little distance back from the ocean is comprised of low rolling hills of sand and gravel, covered with a thin soil. These hills follow the line of the coast in the form of bluffs. On the beach at the foot of the bluffs very rich sand has been found and in years past large amounts of money have been extracted. As it is probable that the waves washed away these bluffs, in the course of time, they have performed a sort of hydraulic process on a gigantic scale and left the heavy particles of gold on the beach. The supposition is that outside the line of surf this fine gold has collected in large quantities in pockets or crevices in the rock. The existence of these beaches so far back from the coast and the fact that the waves would naturally throw up the lightest instead of the heavier particles, is sufficient evidence to overthrow the old theory, that these sands were thrown up by the action of the waves from the bottom of the ocean.

It will probably be interesting to our readers to learn something of the manner in which these "black-sand" claims are worked, that is, those which are situated not on the present beach, but back in the timbered country several miles from the beach proper. The deposits generally lie parallel to the present beach and are buried under from 50 to 75 feet of common white sand. The great difficulty in making these claims profitable has been from the reason that the gold is very difficult to save. In the first place it is extremely fine and light, and the difference in specific gravity between it and the black sand, containing a large proportion of magnetic iron, with which it is associated, is so little that separation by ordinary means is inconvenient. Moreover, the gold is coated with some foreign substance which prevents its amalgamation with quicksilver. This is thought by some to be chiefly organic matter, perhaps of bituminous oils, and by others simply oxide of iron. At all events this peculiarity is a disadvantage to making the claims profitable, as so much is lost.

Colonel Lane, one of the proprietors of the "Pioneer Black Sand Mine," near Randolph, Coosue County, Oregon, was in this city this week purchasing improved appliances for working the sand, and he has furnished us with some interesting information concerning the method of working. The deposit upon which this claim is located is about 350 feet wide, and lays parallel to the present beach, with an average depth of six feet. The deposit is covered with about sixty feet of white sand, on top of which is a growth of timber. This deposit extends, to Col. Lane's knowledge, about three miles, and lies about two miles from the present ocean beach. The mine has up to this time been worked in the old-fashioned way, with sluices, copper plates, riffles, blankets, and the usual gold-saving apparatus. In this rude manner of working they have managed to save only about one-tenth of what was in the sand, but even then have done pretty well with the olism. They have saved about \$2.50 per ton at an expense of 50 cents per ton. Difficulty is experienced in opening these mines from the water, and they require to be drained before much can be accomplished. In order to work it, deep cuts are sluiced through down to the bed-rock, and then tunnels are run, and the heavy sand which contains the gold is brought out in cars to the sluices. The lagging in the tunnels is set very close, and where the water is very bad moss is caulked into the cracks. The top and sides being of sand, of course great care must be taken in timbering.

To get water to this claim a ditch and fluming 6 miles long was made, and in opening a tail race to the ocean from the claim a large cut had to be made through the rolling hills from 40 to 80 feet deep a length of about 2 miles. There is only about 175 feet fall from the bedrock in the claim to the beach. In cutting this tail-race it was necessary to cut through a large deep lagoon, which was a very difficult operation, an immense amount of labor being expended in this alone. Although there is plenty of water

in the winter, in the summer it is scarce, as all the soil thereabout is sandy and will not hold it. For this reason all the sluicing off of the top dirt is done in the winter, though there is water enough for working purposes on a small scale in summer. The character of the ground upon which these claims are located is described at length in a paper read before the California Academy of Sciences, by W. A. Goodyear, of the State Geological Survey, and published in the *MINING AND SCIENTIFIC PRESS* of December 14th, 1872. In the claim mentioned, at this time of the year they have about 50 inches of water, but only 20 feet fall. However, a powerful head of water is not needed for this sand as would be the case in regular hydraulic diggings.

As mentioned previously, great trouble is experienced in working these sands to a profit, and Col. Lane and others have tried innumerable experiments to obviate this difficulty, and devise some plan to work them economically and carefully. In some claims in that region the chlorination process is employed with good results as far as working is concerned, but the expenses almost eat up the profits. They have tried working it in ordinary pans, but the black sand and gold combined, is so heavy that the quicksilver "flours" very badly, and the results were not satisfactory. In some cases the sands have been burned before amalgamating, in order to free the gold of the covering of extraneous matter. This of course entails additional expense. As a result of some recent experiments at the "Pioneer" claim new machinery has been constructed in this city, which will shortly be put up at the mine. As soon as any practical results are accomplished in working these sands economically, we will give a description of the process employed; until such time it is hardly worth while for us to go into detail.

Mining Suit at Pioche.

The excitement in Pioche, Nev., over mining suits continues, and there is a great row among the lawyers. During the continuance of the Raymond & Ely vs. Hermes suit the whole community seemed to divide into hostile parties, and street fights were all the rage. The court house was crowded from day to day, the arguments of the lawyers were long and heated, the jurors were confined like prisoners, attended by officers at all times, the Court house was surrounded by men in the interests of both parties, to prevent either judge or jury from being improperly approached, and when the verdict was rendered, the excitement instead of decreasing as one would naturally expect, seemed to increase. The case is not yet determined, however, a stay of proceedings having been granted. It is stated that after the jury had retired, the first ballot taken was on the question as to the validity of the Panaca title, which resulted in a unanimous vote against it. After which the vote was taken on the equity part of the case, resulting in nine for Hermes, and three for Raymond & Ely Company, thus giving defendant a verdict. Judge Fuller granted a stay of proceedings in the case, to give plaintiff time to file an application for a new trial, on the grounds of misconduct by the jury, of the verdict being contrary to law and evidence, and on the rulings of the Court, to which exceptions were taken. Out of twenty-six rulings, defendants only got three rulings in their favor. The ground in question is known as virgin ground and is very rich.

The case of the Raymond & Ely vs. Kentucky is for all the Kentucky claim lying east of the point 525 feet west of Lightner Shaft, consequently, it is for about 800 feet of the Kentucky claim. The tracings from the surface of the Kentucky cut to the fourth level of the Raymond & Ely Mine, prove the ledge to be one and the same throughout. Rumor has it that this case will be settled in some way without legal trouble, and if that is so probably all the heavy mining suits now pending in Pioche will shortly be settled. Although all the trouble is a great burden to Ely District, it proves the richness of some of the ground there, for if it were not valuable, there would be no contention concerning it.

THE VIENNA EXPOSITION opened as was announced, on the 1st of May, but the United States Department is in confusion—a consequence of the difficulty in relation to the Commission. The proceedings began with an address from Archduke Charles to the Emperor, congratulating His Majesty on the auspicious event, and asking him to pronounce the exhibition open. The Emperor replied briefly, expressing satisfaction at the completion of preparations for the great work. He then formally declared the Universal Exhibition of 1873 opened.

The American department remains in confusion, but Minister Jay is endeavoring to repair the effects of previous mismanagement.

Large Mining Dividends.

People who doubt the permanence and richness of the Comstock lode, and who revile against mining operations on general principles, will doubtless be surprised at the dividends paid by the companies on this lode this month. The Crown Point mine has declared a dividend of \$10 per share aggregating \$1,000,000, the largest dividend ever paid by a mining company in one month on this coast, or elsewhere as far as we know. The Belcher's dividend of \$8 per share, aggregating \$832,000, is the next largest ever paid, both together amounting to \$1,832,000 from these two mines for one month. The Eureka mine has declared a dividend of \$2 per share, equal to \$40,000, and the Consolidated Amador will probably pay \$1 per share, or \$30,000, which will aggregate \$1,858,000 for one month. The dividend of the Crown Point mine is just double what it was in April, when \$5 per share was declared, aggregating \$500,000, which added to that of the Belcher for April amounted to \$1,020,000. Moreover the surplus of the Belcher for April was \$200,000, which added to the surplus on hand, makes about \$1,000,000 carried over to be added to the production for the current month.

As showing the relative increase in the amount of dividends disbursed by these companies, the following figures are interesting. During the year, 1872, the amount disbursed in this manner by mining companies called on our Stock Board was \$6,731,100; in 1871 the mining dividends were altogether only \$4,837,850, showing an increase of \$1,893,150. This increase occurred, notwithstanding a number of prominent companies which paid dividends in 1871, paid none in 1872. They were the Amador, Eureka Consolidated, Redington Quicksilver, Sierra Nevada, Succor, and Yellow Jacket. The sum paid in 1872 was by the following companies:

Belcher.....	\$2,184,000
Cedarberg.....	36,000
Chollar-Potosi.....	55,000
Crown Point.....	1,850,000
Eureka.....	40,000
Keystone Quartz.....	30,000
Mahogany.....	15,000
Meadow Valley.....	360,000
North Star.....	27,000
Pioche.....	40,000
Provident.....	3,100
Raymond & Ely.....	2,070,000
Yule Gravel.....	10,000

Total.....\$6,731,100

The dividends thus far this year are as follows:

COMPANIES.	AMOUNT.
Belcher.....	\$2,490,000
Crown Point.....	2,100,000
Consolidated Amador.....	120,000
Cedarberg.....	24,000
Diana.....	1,181
Eureka.....	120,000
Meadow Valley.....	60,000
Monitor-Belmont.....	50,000
Raymond & Ely.....	300,000

Total.....\$5,265,181

These dividends were paid irregularly. The Diana and Meadow Valley paid one each, the Monitor-Belmont, and Raymond & Ely two, and the others three each up to this month. This is exclusive of coal mining companies, our figures having to do only with gold and silver. Besides these, the Idaho mine, at Grass Valley, not called in our Stock List, has just paid \$20 per share, not taken into account.

From these figures will be seen the great increase in amount of mining dividends this year. The amount for the first five months of 1873—some dividends for May not yet having been declared, moreover—exceeds the total dividends of 1871 by \$427,231. The dividends thus far in 1873 being, \$5,265,181 and that of the total for 1871 being \$4,837,950, leaving a difference in favor of these first five months of \$427,231.

It must be remembered, however, that these figures only represent the dividends of those mines dealt in at our Stock Board, a point always to be borne in mind. Thousands of mines scattered over the Pacific Coast pay out large sums to their owners of which the public hear nothing. Some of our heavy mining capitalists own these mines alone, or associated with one or two others, and as only private reports are made, the figures are not made public. We know of a number of such instances. The hydraulic claims of our own State, owned by a few hard-working men, pay large sums monthly, which do not find their way into the statistics. An example of this is shown in an item in another column, where it will be seen that the Spring Valley Canal and Mining Company at Cherokee Flat, Cal., turned out \$50,000 in gold in April. Consequently people should not say, "mining does not pay," because they see in the papers that during 1872 only \$6,731,100 was paid out as dividends, while the bullion production was \$62,236,914. This money not only went into business channels, but supported many thousand men and made fortunes for thousands more.

UTAH RAILROADS.—The Jordan and Wahsatch narrow-gauge road started its first train on Monday, everything moving smoothly.

The Supposed Ancient Sea Levels of the Pacific Coast.

At the last meeting of the California Academy of Sciences, Professor Geo. Davidson of the U. S. Coast Survey, read a very interesting paper on "The Abrasions of the Continental Shores of Northwest America, and the Supposed Ancient Sea Levels." As the ideas advanced are somewhat at variance with the generally received theory on the subject, we have prepared a synopsis of the paper. In making examinations of the well marked benches or plateaus bordering the Pacific Coast, northward of Cape St. Lucas, Professor Davidson has been led to doubt their marking the ancient sea levels, arising from an elevation of the coast line, or that they were the work of water alone. That some few of the smaller ones which are composed of gravel, etc., were made by the action of water, and may mark ancient sea levels, may be admitted; but those that exhibit on an extended scale, level plateaus of rock, which have every degree of inclination or contortion of stratification, and an infinita variety of texture, cannot have been so wrought.

Other forces more powerful and more uniform and constant in action than water, shaped these flat-topped rocky benches or plateaus; and these forces, if more than one, were those that abraded the present continental line of our coast and the larger islands of the Santa Barbara channel. The terraces may have been formed at the surface of the sea or above it, but more likely beneath it, and subsequent elevations of the land brought them to their present position. Much of the sharp outlines of this abrasion and terrace forming, has been obliterated by subsequent causes; principally by water from precipitation, alternations of heat and cold, and the action of water. After this Professor Davidson enumerated the principal examples which he gathered in a recent trip to Mexico together with those which he had examined in past years, to the northward and southward of San Francisco, a few of which we quote with the illustrations. Northward of Cape Colnett he had very favorable opportunities to study the coast lines, and the numerous and well marked examples of terraces that are cut and planed in the flank of the high rocky coast barrier. Vancouver has a view of the mesa or table forming Cape Colnett, with the strata inclined at a large angle and the surface out off quite level. Five miles southward of Point Grajaro about lat. $31^{\circ} 35'$, a deep cañon-like valley opens upon the ocean and exhibits numerous and very sharply marked rock terraces on both sides and at all elevations reaching nearly a thousand feet. The cañon stretches well back into the mountains. (See Fig. 2.)

The northernmost of the Todos Santos Islands about latitude $31^{\circ} 40'$, and not laid down on recent charts, is itself a well marked, rocky, horizontal plateau, thinly covered with soil; whilst the southern island has two terrace marks—the lower corresponding to the level of the top of the northern islet, another higher one near the summit of the islet, about twice the height from the sea. Even a lower terrace line may be traced about 15 feet above the present sea level. When passing abreast of the northern point of Todos Santos Bay, no less than four well marked terrace rocky points were sketched in the same view. Each point had other terraces of greater elevations rising inland; whilst to the northward stood out the well-known Table Mountain with its remarkable flat top 2,244 feet above the sea and having a breadth of 4,800 feet. On this single view (See Fig. 3) no less than fourteen terrace markings are exhibited, including Table Mountain. The vicinity is the best marked terrace formation that Professor Davidson knows of on the Coast. They are not made in soft soil, but appear as if a planing machine had cut them out of the solid rocks. Between Point Loma and San Juan Capistrano on the Coast is another example; a broad table land of from 100 to 300 feet in elevation, stretches many miles; and at certain points over the plateau there are gravel deposits of peculiar shape for which I have in vain endeavored to find a cause in the movement of water. Their low rounded summits are about two feet above the general level, from twelve to twenty feet in extent, and lie contiguous to each other, over occasional large areas, ceasing suddenly and giving place to the very flat table.

Point Dume lying about 25 miles W. N. W. from Point Vicente is another well-defined table, where a projecting spur from the mountains has been planed off for two or three miles, whilst towards the extremity a deeper grooving has been plowed out and left the head as a dome shaped point (See Fig. 1.) At San Buenaventura and hence towards Point Conception, we found numerous narrow rocky plateaus, but most remarkably exhibited in the vicinity of Point Conception, where the bluff shows every inclination of stratification, but the top is flat and comparatively smooth. It is a counterpart of Point Dume, but more extended.

Anacapa Island lying in the throat of the Santa Barbara Channel and directly abreast the

opening of the extensive valley of Santa Clara consists of a very narrow five-mile ridge of coarse dark gray sandstone; two thirds of the length, reckoned from the Eastern extremity, has been planed off. (See Fig. 4.) The sides are perpendicular and the summit of the Eastern part is almost 300 feet above the sea; whilst the western part rises 930 feet in height, but the line of the level of the summit of the Eastern part is marked around the flanks of the western, notwithstanding the deep gulches with almost perpendicular sides which cut from the summit the top of the bluff. Innumerable instances were cited by the Professor with relation to the general existence of these terraces the whole length of the Coast, but the cases spoken of above will be sufficient for illustration. In most of the cases mentioned the rock appears to have been absolutely planed off, and the different degrees of hardness of the stratification have no apparent influence upon the mechanical forces at work. At Point Arena, for instance, some of the terraces near the cove reach over 200 feet elevation, and whilst the bluff for miles exhibits every contortion of stratification and every degree of hardness, the surfaces of the terraces are planed off.

No indications of terrace formation are shown by photographs taken along the outer shores of Vancouver or Queen Charlotte Islands, nor did Professor Davidson find them among the inner passages of the Great Archipelago extending from Olympia in 47° to the mouth of the Chilkah river in 59° , although he measured the directions and depth of the markings of ice action among the islands of Washington Sound and the adjacent parts of Vancouver Island, both in the clear cut and very deep groovings, and in the presence of large numbers of erratic boulders. Middleton Island, in the Gulf of Alaska, is the only flat-topped rocky island mentioned or depicted by any of the navigators in that direction. Among the Aleutian Islands, or along the pen-

insula of Alaska, Professor Davidson saw no terrace formations, such as have been described as occurring lower down this coast. In all these instances, and others not enumerated, we find a prevailing feature, regardless of the dip or stratification of the rocks—a nearly level surface of rock, with a comparatively thin layer of soil thereon; the plateaus, sometimes miles in extent, bordering the coast line with jagged cliffs, which illustrate the action of water and weather. Above these plateaus are frequently others stretching in shore, and reaching elevations of certainly 1,200 feet, and probably more.



Fig. 1.—Point Dume.



Fig. 2.—Valley Opening on Coast, South of Todos Santos Island.

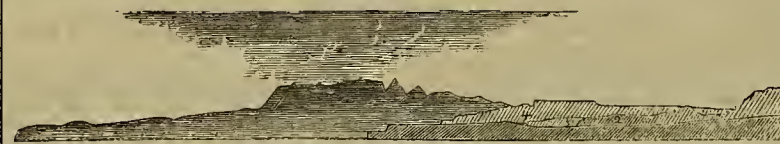


Fig. 3.—Table Point, North of Todos Santos Bay.



Fig. 4.—Island of Anacapa.

Whilst the general plateaus are level, or nearly so, there are numerous indications that broad groovings have been made across them, as exhibited in the cuts of Points Dume and Anacapa Islands. These plowings or groovings are across the points and across the islands, and run with the general trend of the coast line. These prominent features are sufficient to satisfy us that more effective and regular agencies were at work to form them than are at work on such a vast scale today. The upheaval of the continental shores by subterranean action, cannot produce such terraces and plateaus; if the shores of the Pacific were to-day to be raised, say 200 feet, we know from the depths bordering them that such results would not be one of the consequences. The action of water will not account for them. Whether by "continued dropping," or by storms, it first wears away the soft, friable parts, leaving the harder; it destroys shores by undermining, and then grinding, it leaves jagged, irregular surfaces. These irregular surfaces, if upheaved above the level of the sea, would not wear away regularly by the weather; the inequalities would in time be filled by disintegrated material, but the surface of the rock would not bear the impress of a planing machine.

We must be guided in a great measure by experience, and judging by our knowledge of present glacier action, I think we can appeal to

the action of ice moving slowly but surely as a great planing machine; its lines of movement, perhaps controlled by masses and elevations of land not now existing as such and by forces no longer acting on such a scale. We may suppose a great ice belt to have existed contiguous to the continent and running parallel with it; and existing at the same period with the ice sheet that covered the continent or lower parts thereof. Some of the mechanical effects of this belt may be those we see exhibited upon the islands and the general coast line; the effects of the latter in the gorges opening upon the shores, in the interior valleys and the mountain flanks when at right angles to the coast line.

All the groovings on Vancouver Island and the islands of Washington Sound at the southern extremity of the Gulf of Georgia, point to the agency which caused them as moving southward; and if we accept an ice sheet over the continent or a part thereof, and an ice belt contiguous to the continental shores, we can readily understand from the manner of the formation of glaciers that it moved as a great stream, or more likely in currents from the north, probably with great slowness but with certainty. Moreover, a body of ice contiguous to the shores of the continent will do its work more or less effectually and at greater or less depths in proportion to its rate of progress and its thickness; so we can understand how terraces of different elevation may have been formed during that period without any relative change of the level of the sea and bordering land, although the same general effects would have been produced if the land had been rising or subsiding. Besides, the mass of ice resting on the land may have done similar work above the level of the sea to what may have been beneath.

Thus these terraces may not indicate the different steps of the elevation of the continental shore; and instead of resorting to the theory

just north of Judas' Head on the Island of Margarita.

To the northward it is reasonable to suppose that the ice-belt lingered longer than at the south; and that when it was dissipated, the destructive agencies of great climatic changes and excessive rainfall were much more active and wearing. Above latitude 40° we do not find the long gently sloping surfaces of disintegrated material; as we advance, even the steep sloping hill-sides give way to the fiord-like coasts of Vancouver, and the Archipelago Alexander. There violent storms, excessive moisture and precipitation and great thermal changes, are producing a hundred-fold greater effect than to the southward, and obliterating whatever evidences existed of the terrace formation. The terraces may have been but partially developed on account of the direction of the movement of the ice-belt not following the trend of the coast line from the westward; or there may have followed a subsidence instead of an elevation of the continental shores of Alaska as before indicated.

PATENTS & INVENTIONS.

Telegraphic List of U. S. Patents Issued to Pacific Coast Inventors.

[REPORTED OFFICIALLY FOR THE MINING AND SCIENTIFIC PRESS, DEWEY & CO., PUBLISHERS AND U. S. AND FOREIGN PATENT AGENTS.]

By Special Dispatch, Dated Washington, D. C., May 6th, 1873.

FOR WEEK ENDING APRIL 23d 1873.

DRENGER.—Ephraim B. Bishop, S. F., Cal. HORSE POWER.—Addison G. Waterhouse, assessor of 6-10ths interest to J. S. and M. Nichols, S. F., Cal.

BAND SAWING MACHINE.—Olpha Bonney, S. F., Cal.

SCRUBBING MACHINE.—Simeon H. Bush, Washington Ter.

The patents are not ready for delivery by the Patent Office until some 14 days after the date of issue. NOTE.—Copies of U. S. and Foreign Patents furnished by DEWEY & CO., in the shortest time possible (by telegraph or otherwise) at the lowest rates. All patent business for Pacific coast inventors transacted with greater security and in much less time than by any other agency.

THE WHITMAN MINE.—This mine is located in Indian Springs Mining District, Lyon County, Nevada. It was sold about three years ago, by the Whitman Gold and Silver Mining Company to the present company who have re-incorporated under the name of Whitman Silver Mining Co. They have been sinking on their mine for the past five months and it is said have found a well-developed ledge of good pay ore ten feet in width at a depth of seventy feet from croppings. Some of the ore is very rich, assaying up in the thousands; the owners have started another shaft to strike the ledge two hundred feet from the croppings, and intend to put up hoisting works this summer.

THE HORTICULTURAL FESTIVAL.—The Bay District Horticultural Society opens its Spring Exhibition at their hall on Stockton street, on this, our day of writing, Thursday May 8th. The public are promised therein one of the finest exhibitions of floral beauty that has ever graced this city, renowned as it has been for its floral displays. This afternoon Dr. E. S. Carr, Professor of Agriculture of the University of California, is to deliver the opening address, and as he is strong on flowers and horticulture we are expecting a rich treat, of which our readers will hear in our next.

SALT LAKE MINING TROUBLES.—Great excitement is caused in mining circles in Salt Lake City by the card of General J. F. Harrison, of New Orleans, Superintendent of the Stafford Lone Star silver mines, denouncing the whole project as a fraud and swindle. Nearly \$200,000 worth of stock was taken and paid for principally in New Orleans. Harrison denounces by name Major J. D. Woolley, of Cheyenne, Colorado; W. J. Jones, of San Francisco, and Col. Anson C. Tichnor and William Gardner, of Salt Lake, as the alleged projectors of the swindle.

STEAM ON THE STREETS.—The Supervisors of this city have granted permission to certain parties to use a method of propelling street cars by steam. They are to be run by the Thermo-Specific engine, a description of which was published in the MINING AND SCIENTIFIC PRESS some time since. It is the invention of Dr. Lamme, of New Orleans, where the method has been practically tested.

DARIEN EXPLORING EXPEDITION.—A dispatch from New York states the members of the United States Darien Exploring Expedition have returned. They report the ship canal via Kappic and De Guado rivers will be twenty-eight miles long, with a tunnel of three miles. It is estimated the entire work will cost \$70,000,000.

Mining as an Investment.

The following interesting and sensible letter we found in the correspondence of the *Mining Journal*: Can mining be made to pay? is a question perpetually being asked; reason says it can, and experience called from a thousand cases gives a sad, emphatic no. Well, let us see how it is, and I shall now speak of failures coming under my own observation. My first experience was with a Chicago company, composed chiefly of bankers and merchants; they bought the A gold mine, and immediately erected a 20-stamp mill, with all the then improved machinery necessary to work 40 tons per day up to perfection. They spent \$52,000 finding out what I showed their superintendent in five minutes, in a pan—that there was no gold in the ledge. But he was a "practical" man, and would believe the returns of a salted mill before a practical miner. When it was plain to his eyes that he was being swindled he couldn't see it. The mill was abandoned and finally sold to pay the taxes. No doubt their experience will ever sadly whisper, no.

Contrast.

This failure of a purse proud corporation with the experience of a few western boys not over half a mile distant, they located in '67 the B lode, took out a few tons of ore, which they crushed in an arrastra of their own building; kept out of debt till they could buy and pay for a mill, which they now own. They have erected excellent hoisting works and have steady paying property, with which neither waster or summer, nor the price of corn makes any change. They have paid their way and kept their expenses far within the capacities of their mine to bear.

Observation No. 2.

In the fall of 1870 a Pittsburg company bought the S. C. mine, employed a general manager, superintendent, assayer, two foremen for the tunnel (they were running to tap the mine at a depth of 130 feet) one foreman of construction, two cooks, six carpenters, a blacksmith and a watchman; proceeded to erect extensive buildings at the mine, spent \$40,000 and quit, without having touched the mine. So do I; this is enough to illustrate my point, though I can give a dozen more just as bad from my experience. Now to reason with such people or to expect that their success is any criterion, would be sheer folly. But let us take the records of legitimate mining and see the result.

In Nevada

During the year 1872, from a partial list before me, I find the following mines have paid dividends as follows: Belcher, \$2,184,000; Crown Point, \$1,860,000; Collier Potosi, two months, \$56,000; Meadow Valley, nine months, \$360,000; Raymond & Ely, \$2,070,000; Pioche, \$400,000 for two months given on the list, besides six others mentioned in this statement paying dividends ranging from \$3,100 to \$20,000 per month. What the whole profit of this industry amounts to we may realize when we consider a State containing only 50,000 people, including Indians, females and non-producers, yielding twenty-five and one-half millions of dollars from this source alone.

California

Comes next with her nineteen millions of ready cash; Montana with four millions; Colorado, three and a half; Idaho with two millions; while the web-foot push nearly two millions more into the national purse as the contribution of Oregon. Other Western States and Territories aggregate nearly seventeen millions more. Without counting our own advancing

Utah

From the table before me I find the actual shipments from the Territory, to be as follows: Silver ore, almost 11,000 tons; unrefined bullion, 5,653 tons; silver bars, \$600,000. This does not, of course, take any account of the ore produced but not shipped, nor bullion at the furnaces which, at the time of making up this report, must have been very considerable, as I know of one pile of over 500 tons that could not have entered into this computation. However let us suppose it has, and we find the silver product of the Territory for the year of 1872 to be equal to one half the entire accumulations of the Territory for the previous 24 years of its settlement as per U. S. census of 1870. In addition to the magnificent and highly gratifying exhibit of profitable returns, we have the no less remarkable increase of profitable and permanent improvements—the direct result of the necessities of the mining population and largely depending upon it for their future profit. There are at present completed in the Territory, according to the latest authority I can find, 22 works smelting for silver ores, with 45 furnaces having a daily capacity of 794 tons. The majority of those works are situated in Salt Lake county and the next adjoining ones west and south. The refinery on the Big Cottonwood has a capacity for 45 tons daily, and is regarded as one of the most successful works for separating in the world. There are also seven stamp mills with a capacity of 167 tons daily; two pulverizers, one at Fairfield and one of Paul's patent at Springville, each of a capacity of about 10 tons per 24 hours. The entire cost of the works for the reduction of ores must amount to nearly \$3,000,000. Those works, or the majority of them, have found steady and remunerative employment from the start, and will

doubtless be largely increased during the coming season. From all sources of information I find that the cash investments in mines in this Territory will not exceed \$10,500,000. Now if we take one-fourth of the amount of silver shipped from the Territory as net profit, which is nearly 25 per cent. less than the ratio of Nevada, we find that the mines of Utah have returned a dividend equal to 10 per cent. on the entire amount invested in her mines—in some cases we know the ratio is much greater and in others much less, but this will serve for an average of returns on investments in Utah mines. Another consideration is, that with few exceptions the permanent works about the mines have been paid for from the product of the mines themselves, notably so in the Cottonwood and American Fork districts. This would be accounted for among the profit of any other business and of course of mines also. I believe that no other productive industry in Utah can show as clean a balance sheet as the mines, and certainly none any better prospects for the future.

Mining as an Investment.

Intelligent people East as well as West know that nothing can exceed the permanence of a well defined silver lode; some in Europe have been worked for over 2,000 years and are still productive. The Comstock mines were it not for their rascally trustees, were never more valuable than they are to-day, notwithstanding the loss consequent on our crude modes of reduction, the dividends of our Flagstaff, Emma, Last Chance and other mines are far in advance of the customary profits of any other legitimate business. Then why is this cry so often heard of unprofitable mines, no returns, a continued outlay, etc. I answer that where common good judgment has been used in selecting the mine, and after the necessary developments have been made, then if the mine does not pay, it is either owing to the most wanton extravagance or a criminal waste of ore about the mine, or a waste of this natural product in the reduction of the ore. What must be done, and what it is notorious is not done is cut expenses down to the last cent consistent with an intelligent system of work; every ounce of ore extracted should be saved if not profitable to work now to keep until new processes shall make it so, contract work should be employed whenever possible in order to obtain just value for the money expended; officers and non-producers should be dispensed with except where absolutely necessary, and in mines employing a small force, one superintendent, or good foreman, will generally be found to be all the mine can afford to pay; still I have one mine in my mind's eye now that this winter employed a general manager, superintendent, clerk, foreman, timberman, blacksmith, cook, and four miners, perhaps this mine will pay some time; it has declared no dividend yet; with increasing intelligence in the working of ore and increased facilities for communication; we may look confidently to the future as an era when mining will be the legitimate pursuit of the people of the trans-Mississippi States of the Union; at present while mining-men are employing an army of parasites to devour the product of their mines and gaily floating one-half of the precious metals down stream or out in the fumes of their furnaces, the only wonder is that there are so many paying mines in the country. That the present gives promise of an improvement is evident, the total yield of 1872 is largely in advance of that of the preceding year while the increase of dividends paid by American Cos. is full fifty per cent. greater than the former year, showing that even upon a corresponding product the net or divisible surplus may be made proportionately much greater.

This will become more apparent as year after year new processes will cheapen the cost of working ore, and also give a higher per centage of metal to the ton, and as the growth of intelligence in matter relating to mines shall have taken the place of the gross ignorance now so manifestly displayed. I venture the assertion that no other industry would suffer a loss of fifty per cent of its entire product in the course of manufacturing as gold and silver mining has done and is doing and still keep up its existence as a business. The loss from this cause alone during the past year has been not less than fifty millions of dollars. Thanks to growing intelligence, the percentage is yearly decreasing and as steadily is the value of our mines becoming more a subject of inquiry among moneyed men.

ELY DISTRICT.—Next week, in a single mine in Pioche, we have it from good authority, says the *Record*, of April 27th, an additional force of two hundred men will probably be put to work, while the forces on half a dozen other mines will probably be increased. We may have the good old times of yore back in a few days, and—we may not. It is evident a crisis is being reached in the affairs of the Ely Mining District, with the chances, according to our judgment, in our favor.

RAILROAD EXPENSES are relatively increasing. Steel rails are taking the place of iron, light rails are taken up, and heavier rails laid down. Better bridges, double tracks, solid earthworks, stone ballast, add both to the cost and durability of the work, as well as to their economy.

RUSSIAN RIVER WATER POWER.—A late survey shows that Russian river falls 171 feet in fourteen miles above Healdsburg, and it is proposed to carry the water in a ditch to the latter place for manufacturing purposes.

THE gold quartz discoveries near Shoshone Valley continue to attract much attention.

Imperial Pumping Machinery.

We are pleased to note the preparations made by some of the companies operating on the Comstock, for carrying on mining operations at great depths by the introduction of machinery commensurate with the work to be performed. We give herewith a somewhat detailed description of the pumping machinery now in operation in the Imperial mine: The foundation consists of 24 feet of stone laid in cement, to which the pumping machinery is anchored by bolts having eyes turned at the bottom, through which bars of iron are passed, so that each bolt has the weight of the entire foundation, estimated at 6,000,000 pounds. The engine, 160-horse power, has a 22-inch cylinder and a 42-inch stroke; length of walking-beam 27 feet. The weight of the engine bed, complete, is 13 tons.

The engine shaft is nine inches in diameter and has two fly-wheels of 11 feet in diameter and weighing 11,000 pounds each. There are two pinion-wheels on this shaft for driving the spur-wheels; also a reel with a 2½ inch hemp cable for handling the pumps in the shaft. There are two spur-wheels, each 11 feet 6 inches in diameter, 14-inch face and weighing 20,000 pounds each. These wheels are placed 18 inches apart, and the wrist-pin, to which is attached the pitman rod for working the pumps, passes through both wheels thus insuring great steadiness and strength. The whole foundation of wood-work is made of California spruce, each one of the timbers being 24 by 26 inches. This is the first pumping machinery so arranged, and from the satisfactory manner in which it appears to work, we have no doubt the plan will hereafter be universally adopted for similar work. The spur-wheel shafts are 10 inches in diameter. There are six 10-inch pumps in the perpendicular shaft, and two of 9-inch in the incline shaft.

The pumps are all of the kind known as "plungers." The pump rods are of timber, 13 inches square and heavily strapped with iron. The weight of the rod is counterbalanced by four balance bobs, carrying 160,000 pounds of ballast; the chord to this main bob is 26 by 24 inches and 30 feet in length. The pumps at present are pumping from a depth of 1,700 ft., and with this present quantity of water will require to be run not to exceed eight hours each in 24. The capacity of this machinery is estimated to be equal to draining the mine to a depth of 3,000 ft. Every portion of it is made in the best manner, and certainly it is not equaled in power or completeness by any on the Pacific coast, and so far as we know, by none in the United States. As showing the energetic character of this machinery, we may mention that on being set to work yesterday afternoon, it pumped up to the surface 22,250 gallons of water in the short space of two hours!—*Gold Hill News*.

The Probable Appreciation of Gold.

In regard to the value of gold in the future, opposite views have been maintained, supported by arguments of some weight on both sides. On the one hand, it is urged that the causes which produce depreciation are only beginning to operate, and a still greater decline in price may be expected, and on the other side it is asserted that there are sure signs of a falling off in production, together with a probability of increasing demands, tending inevitably to an appreciation of the standard the next 20 years.

The current supply of gold has been calculated to amount to about \$20,000,000. The current demand is reckoned at \$12,000,000 which is made up thus:—

English annual consumption	\$5,000,000
Indian ditto	4,000,000
Australian ditto	1,200,000
South American ditto	1,000,000
Portuguese, Spanish, etc., ditto	800,000

Total.....\$12,000,000
Hence it appears that there is an annual excess of \$8,000,000, which would produce depreciation if it were not absorbed by the extraordinary demands likely to occur. That there will be such demands for gold is very certain, and it is also most probable that the \$8,000,000 will prove inadequate to meet them.

The demand for Germany is very urgent and of great magnitude. The Germans have decided to have a gold currency, and this means that within the next few years Germany must obtain, in round numbers, between \$60,000,000 and \$80,000,000 of gold. In 1872, in fact, Germany coined about \$21,000,000, and she proposes to coin \$18,000,000 in 1873. Germany is a good deal more populous than France, but France, twenty years back, took up about \$200,000,000 of gold, therefore, to assume that Germany will use up half that amount, is no extravagant supposition.

Omitting minor demands, such as the Scandinavian, of an extraordinary character, it is necessary to count on great requisitions of gold for the United States and France in a not distant future, owing to the resumption of specie payments in those countries. It is probable that the decline of the German demand will coincide with the commencement of the demand for the United States, and that, by the time this latter is satisfied, France will come into the market as a large buyer of gold.

The conclusion, therefore, to be drawn from these arguments is, that for some years to come there will be a great demand for gold probably exceeding the supply; and, unless there be an improvement in the annual production of gold, or some compensation be found in a greater economy of existing stocks, it is reasonable to expect that, during the next decade, gold will rise in value.—*Iron*.

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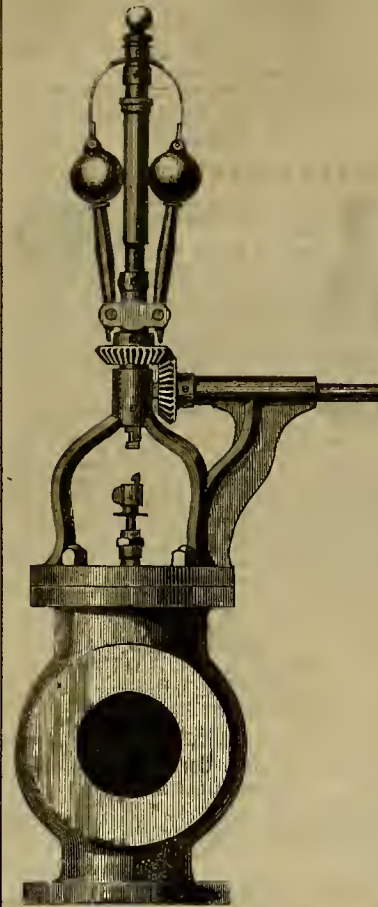
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in its favor for the following reasons:

1st. It SAVES US FUEL. Previous to attaching your Gov-
ernor we were burning 34 cords of wood per 24 hours. We
now consume but 2½ cords doing the same work.

2d. FOR SAFETY. The "trip" saved us from an expensive
smash up but a few days ago, during the temporary ab-
sence of our engineer. The governor belt run off the Pul-
leys. Your little automatic trip worked like a charm, and
but one or two revolutions was the result, and no damage.
Had we been using any other Governor, the probability is
that we would not have had a whole cam in the mill.

3d. IT IS A PERFECT GOVERNOR. We can turn off the
Wheeler Pan and hang up one-third of our stamp, without
any perceptible change in speed.

4th. THE ADJUSTMENT for regulating the speed without
increasing or reducing the size of our Governor pulley, is
admirable, and as easily managed as setting a clock.

5th. IT IS SIMPLE and not liable to get out of order, or
requiring more than ordinary care.

Yours respectfully,
JAS. H. CROSSMAN, Supt.
GEO. H. BARNEY, Chief Eng'r.

REFERENCES:
Rhode Island Mill, Crown Point M. Co., Gold Hill, Nev.
Eureka M. Co., Overman M. Co., Virginia City, Nev.
Camp Floyd M. Co., Utah S. M. Co., Utah.
Falk & Miner, Eureka; J. M. Brown, Hollister; Gazos
Mill, Pescadero, Cal.
Also, Bancroft & Co.; Yolo Mills; The Union, Golden
Gate, Etna and Fulton Iron Works, of this city.
All Governors Tested, the Number Revolu-
tions Marked on the Croes-Head, and
Warranted Perfectly Reliable.

JOSHUA HENDY,
No. 32 Fremont Street.....SAN FRANCISCO.
PATENT ORE AMALGAMATORS AND CONCENTRATORS,
Circular Saw Mills
Send for Descriptive Circular. feb22-1am-17

AXLE GREASE.
To Millmen, Teamsters and Others.
Your attention is called to the very superior AXLE
GREASE manufactured by us for over 13 years.
Recent improvements in the chemical arrangement
of the lubricants used in its manufacture render its use
as serviceable on the lightest buggy as on the heaviest
team.
The extensive demand for the H. & L. Axle
Grease has enabled the proprietors to reduce its price
to as low a rate as any of the inferior compounds,
which are continually being forced upon the market.

AVOID
TRADE MARK
H & L
IMITATIONS
See that the trade-mark (H. & L.) is on the red
cover of the package, and take no other.
HUCKS & LAMBERT,
Manufacturers & Sole Proprietors,
SAN FRANCISCO.
Factory.....145 Natoma Street.
Depot.....812 Jackson Street.
10v5-1amhp-1y

DEWEY
The Most Complete Invention for Opening
Cans ever Invented.

No family that uses canned Fruits, Vegetables, Sar-
dines or Oysters, should be without one of these con-
venient household tools. No Restaurant, Hotel or
Oyster Saloon can afford to do without one. It will
cut any shaped hole, from a triangle to a perfect circle.
One sample sent postage free for 75 cents.

WIESTER & CO.,
17 New Montgomery st. (under Grand Hotel), S. F.

NICKEL PLATING.
The San Francisco Nickel Plating Company
Are prepared to plate articles of all descriptions, of any
metal. Cutlery, Liquor Flasks, Pistols, Guns, Swords, Bri-
dle Bits, Pole Crabs, Hub Bands, Dress Ralls, and all ar-
ticles of household hardware plated at short notice, and
warranted. Nickel Plate never tarnishes or corrodes,
always retaining its polish until the article is worn out.
Office at the KIMBALL MANUFACTORY WORKS, Cor.
Fourth and Bryant Streets. 12v26-3m

CHARLES F. KIRCHNER,
Sampler and Crusher of Ores,
NO. 11 DRUM STREET,
San Francisco.

NICKEL PLATING.
The San Francisco Nickel Plating Company
Are prepared to plate articles of all descriptions, of any
metal. Cutlery, Liquor Flasks, Pistols, Guns, Swords, Bri-
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Fourth and Bryant Streets. 12v26-3m

CHARLES F. KIRCHNER,
Sampler and Crusher of Ores,
NO. 11 DRUM STREET,
San Francisco.

Metallurgy and Ores.

RODGERS, MEYER & CO.,
COMMISSION MERCHANTS,
ADVANCES MADE
On all kinds of Ores, and particular attentions
PAID TO
CONSIGNMENTS OF 6000 LBS
4v16-3m

C. W. STRONG & CO.,
Metallurgical Works,
No. 10 Stevenson Street, near First, SAN FRANCISCO

We purchase Ores, Bullion, etc. Ores worked and
Tests made with care. Also, Assays of Gold, Silver,
Copper, Lead, Tin and other Metals. 23v22-17

LEOPOLD KUH,
(Formerly of the U. S. Branch Mint, S. F.)
Assayer and Metallurgical
CHEMIST.
No. 611 Commercial Street,
(Opposite the U. S. Branch Mint
SAN FRANCISCO, CAL. 7v21-3m

JOHN TAYLOR & CO.,
IMPORTERS OF AND DEALERS IN
ASSAYERS' MATERIALS
Chemical Apparatus and Chemicals,
Druggists' Glassware and Sundries,
PHOTOGRAPHIC GOODS, ETC.,
512 and 514 Washington street, SAN FRANCISCO

We would call the special attention of Assayers
Chemists, Mining Companies, Milling Companies
Prospectors, etc., to our large and well adapted stock of
ASSAYERS' MATERIALS

Chemical Apparatus,
Having been engaged in furnishing these supplies since
the first discovery of mines on the Pacific Coast.
Our Gold and Silver Tables, showing the value
per ounce Troy at different degrees of fineness, and val-
uable tables for computation of assays in Grains
Grammes, will be sent free upon application.
7v25-17 **JOHN TAYLOR & CO.**

Important to Miners and Mill Men.
Silver-Plated Copper Amalgamating Plates,
for Saving Gold.

Of all sizes and in any quantity, furnished to
order. Full instructions sent for operating.
Particular attention given to plating goods for
Builders, Plumbers, etc. Hotel and Restaurant
work replated.
SAN FRANCISCO GOLD AND SILVER PLATING WORKS,
655 Mission street, San Francisco.
2v25-3m **E. G. DENNISTON, Proprietor.**

Varney's Patent Amalgamator.

These Machines Stand Unrivaled.
For rapidly pulverizing and amalgamating ores, they
have no equal. No effort has been, or will be spared
to have them constructed in the most perfect manner
and of the great number now in operation, not one has
ever required repairs. The constant and increasing de-
mand for them is sufficient evidence of their merits.
They are constructed so as to apply steam directly
into the pulp, or with steam bottoms, as desired.

This Amalgamator Operates as Follows.
The pan being filled, the motion of the muller forces
the pulp to the center, where it is drawn down through
the aperture and between the grinding surfaces.—
Thence it is thrown to the periphery into the quicksilver.
The curved plates again draw it to the center, where it
passes down, and to the circumference as before. Thus
it is constantly passing a regular flow between the grind-
ing surfaces and into the quicksilver, until the ore is
reduced to an impalpable powder, and the metal amal-
gamated.
Settlers made on the same principle excel all others.
They bring the pulp so constantly and perfectly in con-
tact with quicksilver, that the particles are rapidly and
completely absorbed.
Mill-men are invited to examine these pans and settlers
for themselves, at the office, 229 Fremont Street,
San Francisco.

Nevada Metallurgical Works.
RIOTTE & LUCKHARDT,
Consulting Mining Engineers and Metal-
lurgists, No. 21 First St., S. F.

WORKING TEST MADE BY ANY PROCESS
—TESTING OF PROCESSES—
Plans furnished for the most suitable Process for Ores.
Assaying in all its Branches.
Analysis of Ores, Minerals, Waters and all other sub-
stances.
Special attention paid to the mining and metal-
lurgy of Quicksilver. 25v11-6m

PLATINUM
Vessels, Apparatus, Sheet, Wire, Etc., Etc.
For all Laboratory and Manufacturing Purposes
H. M. RAYMOND,
35 Bond street, New York.
Platinum Scrap and Ore purchased. 22v1-8

Academy of Sciences.

The regular semi-monthly meeting of the California Academy of Sciences was held at their rooms on the 5th inst. Messrs A. P. Moore, and W. H. Hollister, were elected life members and C. V. B. Keating and O. C. Pratt resident members. Among the donations to the Academy was the

First California Shad,

Which was presented by Wm. Throckmorton, one of the State Fish Commissioners. In presenting the specimen Mr. Throckmorton said that on the 27th of June, 1871, this shad was three-quarters of an inch in length, and was put into the Sacramento river at Tehama, after making a trip across the continent. One of the first efforts of the Commissioners was to get shad, from the Eastern coast, because it was emphatically a food fish; and the desire was to ascertain whether it could be propagated on this coast with success. The Commissioners opened correspondence with Mr. Seth Green on the subject of bringing over the fish. He discouraged the Commissioners at once, from the fact that the shad is hatched in from 36 to 45 hours. The Commissioners then tried to obtain a small supply of water for transit, and the railroad companies were kind enough to give them the use of a construction train for the purpose. Mr. Green said it was impossible to bring the adult fish across the continent, and it was useless to try. The Commissioners experimented on the last alternative. They sought to ascertain whether it was possible for the young fish to live in fresh water instead of salt, long enough to cross the continent. They did not hear from Mr. Green for three months, and he stated that he had spent that time in experiments. He had hatched young fish, had them kept in glass jars, and had ascertained that life could be preserved for several weeks, and be could transport any number required.

He brought on to this coast 15,000. They were hatched in the Hudson on Saturday night; they arrived here on Tuesday week, and at nine o'clock that night they were placed in the Sacramento above Tehama. Mr. Green examined the water there, and pronounced the conditions favorable. He afterward examined the mouth of the harbor, and found the feed good on the coast. No fish were lost on the way, except those removed from the water for experiments. Above Tehama last year an Indian caught a little fish, and no one could tell what it was. Mr. Throckmorton had not seen it. The first which had been presented was caught recently in a trap below Vallejo. It was a male, and was not full grown. The fish would be at maturity next year, and they might be expected in the harbor from the sea by the month of April. They would be full-sized breeding fish, and if a quarter of the 15,000 came back as breeding fish, they would be sufficient to stock our coast.

Last year the Commissioners had sent East for 50,000 fish, but the very hot weather which prevailed broke up the arrangement. This year the Commissioners have made ample arrangements for a supply of Eastern fish. They have now at Charleston, New Hampshire, a full-sized car, which they have obtained from the Central Pacific Company. The car was being fitted up with all the appliances for the conveyance of a large assignment of fish; which will consist of black bass, white perch, yellow perch, and glass-eyed perch, eels, cat-fish and lobsters; and when it arrived at the Hudson River it would stop long enough to take in 100,000 shad. The car would arrive in California by the middle of June. From this consignment the Commissioners hoped to make a fair start in stocking this Coast with food fishes. They had taken no account of fancy fishes, but had endeavored to spend the moderate appropriation of the State for some permanently useful purpose. The reports as to other shad having been caught, the Commissioners have not been able to authenticate.

White Fish.

This season the Commissioners had brought across the Continent a large number of white-fish eggs, and had succeeded in hatching 125,000. They were now alive and well in Clear Lake, removed from all risk, having been placed there three weeks ago in healthy condition. These fish had come from the northern lakes of New York.

Orchilla.

Professor Davidson presented specimens of orchilla from Magdalena Bay Mexico. This is mainly used in the production of red and purple dye. In connection with this plant Dr. Kellogg said that it is used to a great extent in giving brilliancy to other colors.

The peculiar iridescence of French ribbons and many choice silks, and also of broadcloth, when looked at a slant before a bright light, is attributed to the orchilla, a small quantity of the dye from which is put in with the other dyeing materials.

Dr. Stont remarked that the orchilla plant fetches from \$250 to \$300 per ton in England and thought that California might be able to supply itself with this valuable agent in dyeing. Of course we should have to contend against aniline colors, and other cheap dyes, which might prevent it being a useful product to California; but as the distance in order to import is so great, and the rates so high, we might fairly suppose that we ought to have the advantage of a productive manufacture for California.

Miscellaneous.

A paper was read on the Abrasions of the Continental shores of Northwest America and the supposed ancient sea levels, by Professor

Davidson; the substance of this paper will be found in another column.

A letter was received from officers of the United States Steamer *Saranac*, conveying to the Academy an interesting collection made by their late messmate, Lieutenant Dennison, and designed by him for presentation to the Academy. The collection embraced rare marine specimens among which were the hermit-crab, porcupine, fishes, hippocampus (sea-horse), etc.

Dr. Kellogg presented a number of new botanical specimens.

After adjournment the members were permitted to inspect a collection of beautiful illustrations of astronomical observations, received by Professor Davidson from the Cambridge Observatory.

Meetings and Elections.

THE ONEIDA M. Co. held its annual meeting on the 5th, and the following Trustees were elected: S. Heydenfeldt, J. Berlemin, Wm. Stewart, J. Steinhardt, B. T. Sherwood, Proctor S. M. Co. Trustees—J. D. Fry, A. K. P. Harmon, Robert Sherwood, J. E. de la Montaigne and Wendell Easton; O. E. Elliott, Secretary.

ORIGINAL HYDREN TREASURY M. Co.—W. B. Bourne, (President), Robert Sherwood, J. H. Crocker, Walter Laidlaw, J. E. de la Montaigne, S. Pinkham and Henry Toomy; D. A. Jennings, Secretary.

NEW INCORPORATION.—THURTELL G. M. Co.—May 3. Object to acquire mining property in township No. 4, Calaveras county, State of California, and work the same. Capital stock, \$5,000,000, in shares of \$100. Trustees—J. Blumens, Jr., R. F. Knox, J. A. Hutchinson, E. J. Hutchinson and H. M. Eddy.

INCREASE OF CAPITAL STOCK.—A certificate of the increase of the capital stock of the Green Gold and Silver Mining Company was filed on the 7th inst. in the County Clerk's office. The original amount of the capital stock was \$600,000 in shares of \$250 each. It has been increased to \$2,400,000, in shares of \$100 each. The amount of capital actually paid in is \$25,000, and the debts of the company amount only to \$50.

A NEW BOOK ON MINING.

The Explorers', Miners' and Metallurgists' Companion; Comprising a Practical Exposition of the Various Departments of Exploration, Mining, Engineering, Assaying, and Metallurgy. The Most Practical and Comprehensive Work on Mining Subjects Extant. Comprising 540 Pages, and 81 Engravings. By J. S. Phillips, M. E. Price, bound in cloth, \$10 (in coin); in leather, \$12. Forwarded by mail, in cloth, \$11.40, currency; in leather, \$13.75. Issued and for sale by Dewey & Co., Patent Agents and Publishers Mining and Scientific Press, S. F.

Try Dr. Evory's Diamond Catarrh Remedy. Only 50 Cents.

Says John to Nance, you look so bright,
Your eyes they sparkle, like a star.
Oh! yes, says Nance, Dr. Evory's remedy
Has cured that horrid, bad catarrh.

OUT OF THE FOG AT LAST.—Dr. Evory has discovered the only sure cure for Catarrh and Ooids. One bottle gives immediate relief, and a few bottles effect a cure. All we ask is a trial. If your druggist don't have it, send to Dr. A. F. Evory & Co., 9 Post street, S. F. It only costs 50 cts. 14725-3m

San Francisco Metal Market.

PRICES FOR INVOICES.

Jobbing prices rule, from ten to fifteen per cent. higher than the following quotations.

WEDNESDAY, May 7, 1873.	
IRON.—	
Sooty Pig Iron, 4 ton.....	\$60 00 @ —
White Pig, 4 ton.....	60 00 @ —
Refined Bar, had assortment, 4 B.....	— @ — 06
Refined Bar, good assortment, 4 B.....	— @ — 06 1/2
Soller, No. 1 to 4.....	05 1/2 @ — 06
Plate, No. 5 to 9.....	06 1/2 @ — 07
Sheet, No. 10 to 13.....	07 1/2 @ — 08 1/2
Sheet, No. 14 to 20.....	08 1/2 @ — 09 1/2
Sheet, No. 21 to 27.....	09 1/2 @ — 09
Horse Shoes, per keg.....	9 00 @ —
Nail Rod.....	11 @ —
Roller Iron.....	6 1/2 @ —
Other Irons for Blacksmiths, Miners, etc.	8 1/2 @ — 9 1/2
COPPER.—	
Strippers.....	35 @ — 38
Copper Tin'd.....	50 @ —
O. Nial's Pat.....	55 @ —
Sheeting, 4 B.....	28 @ — 29
Sheeting, Yellow.....	28 @ — 29
Sheeting, Old Yellow.....	28 @ — 12 1/2
Composition Nails.....	29 @ — 30
Composition Bolts.....	29 @ — 30
TRY PLATES.—	
Plates, Charcoal, 1X 4 box.....	14 50 @ 15 —
Plates, 10 Charcoal.....	13 50 @ 14 —
Roasting Plates.....	13 50 @ 14 —
Banco Tin, Slab, 4 B.....	40 @ — 42 1/2
STEEL.—English Cast, 4 B.....	20 @ — 25
Drill.....	20 @ — 25
Flat Bar.....	16 @ — 17
Plough Points.....	16 @ — 17
Russia (for mould boards).....	17 @ — 18
Zinc, Sheet.....	34 @ — 10
NAILS.—Assorted sizes.....	54 @ — 9

Leather Market Report.

(Reported for the Press by Dolliver & Bro.)

SAN FRANCISCO, Wednesday, May 7, 1873.

The market for Sole Leather continues the same. French Calf steady at old prices, with light demand.

City Tanned Leather, 4 B.....	26 1/2 @ 29
Santa Cruz Leather, 4 B.....	26 1/2 @ 29
Country Leather, 4 B.....	23 @ 25
Stockton Leather, 4 B.....	26 1/2 @ 29
Jodot, 5 Kil, per doz.....	85 00 @ 84 25
Jodot, 11 to 15 Kil, per doz.....	66 00 @ 85 00
Jodot, second choice, 11 to 15 Kil, per doz.....	55 00 @ 70 00
Levin, 12 and 15 Kil, per doz.....	88 00 @ 70 00
Cornellian, 12 to 15 Kil, per doz.....	57 00 @ 67 00
Cornellian Females, 12 to 15 Kil.....	60 00 @ 64 00
Cornellian Females, 14 to 16 Kil.....	66 00 @ 72 00
Cornellian, 4 B.....	54 00 @ 62 00
Simon, 20 Kil, per doz.....	65 00 @ 67 00
Simon, 24 Kil, per doz.....	72 00 @ 74 00
Robert, Calif, 7 and 9 Kil.....	35 00 @ 40 00
French Kips, 4 B.....	1 00 @ 30
California Kip, 4 B.....	50 00 @ 60 00
French Sheep, all colors, 4 B.....	8 00 @ 15 00
Eastern Calf, 4 B.....	11 00 @ 12 25
Sheep Roams for Topping, all colors, 4 B.....	3 00 @ 15 00
Sheep Roams for Linings, 4 B.....	5 00 @ 10 50
California Russell Sheep Linings.....	1 75 @ 5 50
Best Jodot Calf Boot Legs, 4 B.....	4 25 @ 25
Good French Calf Boot Legs, 4 B.....	4 50 @ 5 00
French Calf Boot Legs, 4 B.....	4 00 @ —
Harness Leather, 4 B.....	40 @ 37 1/2
Fair Bridle Leather, 4 B.....	40 @ 37 1/2
Shirting Leather, 4 B.....	34 @ 37 1/2
Welt Leather, 4 B.....	30 @ 30 00
Best Leather, 4 B.....	21 @ 25
Wax Side Leather, 4 B.....	17 1/2 @ 19
Eastern Wax Leather.....	26 @ —

No LIFE INSURANCE COMPANY has a better record or more permanently popular reputation than the CONNECTICUT MUTUAL LIFE INSURANCE CO. J. B. Roberts, 315 California Street, San Francisco, is general agent for this Coast. Send to him for circulars and information of this reliable, first-class company.

For the very Best Photographs go to BRAD LEY & RULOFSON'S GALLERY, with an "Elevator," 429 Montgomery street, San Francisco. 2674-cowbp3m

CONTINENTAL LIFE INSURANCE CO., No. 302 Montgomery street, corner of Pine.

LEA & PERRINS'

CELEBRATED

Worcestershire Sauce.



Declared by Connoisseurs to be the only good SAUCE.

Caution Against Fraud.

The success of this most delicious and unrivalled Condiment having caused certain dealers to apply the name of "Worcestershire Sauce" to their own inferior compounds, the public is hereby informed that the only way to secure the genuine is to ask for LEA & PERRINS' SAUCE, and see that their names are upon the wrapper, labels, stopper and bottle.

Some of the foreign markets having been supplied with a spurious Worcestershire sauce, upon the wrapper and labels of which the names of Lea and Perrins have been forged, L. and P. give notice that they have furnished their correspondents with power of attorney to take instant proceedings against manufacturers and vendors of such, or any other imitations by which their right may be infringed.

Ask for LEA & PERRINS' Sauce, and see name on wrapper, label, bottle and stopper.

Wholesale and for export by the Proprietors, Worcester; Cross & Blackwell, London, &c., &c., and by Grocers and Chimney universally. 15724-4f

JOSEPH GILLOTT'S
STEEL PENS.

Sold by all Dealers throughout the World.

19726-1y

San Francisco Cordage Company.

Established 1856.

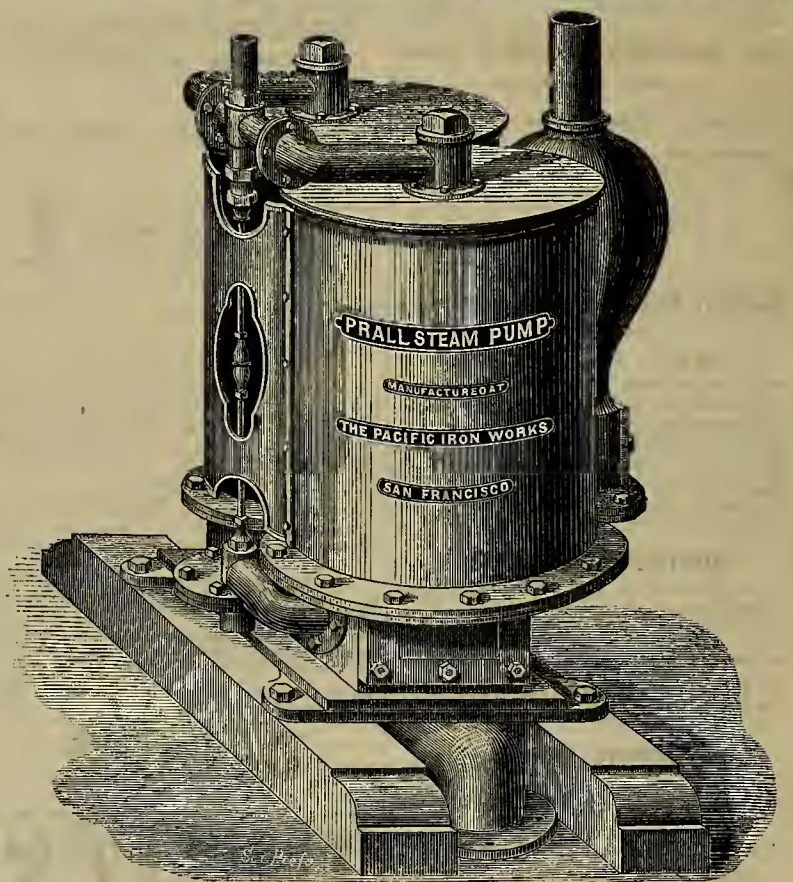
We have just added a large amount of new machinery of the latest and most improved kind, and are again prepared to fill orders for Rope of any special lengths and sizes. Constantly on hand a large stock of Manila Rope, all sizes; Tanned Manila Rope; Hay Rope; Whale Line, etc., etc.

TUBBS & CO.

17726-4f 511 and 513 Front street, San Francisco.

THE PRALL CONDENSING STEAM PUMP.

The Cheapest, Most Reliable, Most Durable and Most Economical Pump in Use.



This remarkable Pump, though having been used extensively in the Western States for the past year, is now for the first time offered to the trade of the Pacific Coast.

It is adapted to the raising of water or other liquids, under all possible conditions where steam can be obtained, operating absolutely without machinery with more economy and less liability to derangement than any Pump in use. As a MINING PUMP its advantages are most obvious.

The steam is condensed instead of being exhausted into the shaft or tunnel. It is not affected by mud, sand or grit, having no working parts to wear or get out.

It is economical of steam, because all friction is avoided, and the steam is made to do double duty, that of direct pressure and then by condensation, utilizing the atmospheric pressure to lift the water to the Pump.

It requires no lubrication nor any attention whatever.

For IRRIGATION and raising water for stock purposes, the Prall Pump is vastly superior to anything ever before invented.

It requires less steam to elevate water from 20 to 30 feet than would be necessary to move any other style of Pump doing no work.

It is so simple that any one of ordinary intelligence, however unaccustomed to machinery, can operate it. They are constructed of seven different sizes, with capacities ranging from two to fifty thousand gallons per hour.

Boilers furnished with the Pumps when desired.

Manufacturing Agents, Pacific Iron Works,

P. O. BOX 726, SAN FRANCISCO.

15726-cow-bp-4f

To Companies that Advertise Daily!

Mining Assessments and Delinquent Sales Advertised Daily in the Daily Stock Ledger at Lower Rates than in Any Other S. F. Daily.

Send for blank forms (free) for advertisements.

It is both justice and economy for Mining Companies to patronize the only practical mining publishers on this coast.

DEWEY & CO., Publishers,

No. 338 Montgomery St., S. F.

PRICES—Same as weekly in MINING AND SCIENTIFIC PRESS.

Mining and Other Companies.

Owing to the time necessary to mail the present large edition of the M. & S. Press, we are obliged to go to press on Thursday evening—which is the very latest hour we can receive advertisements.

Angels Quartz Mining Company—Principal place of business, 408 California street, San Francisco. Location of works: Angels Mining District, Calaveras County, California.

Notice.—There are delinquent upon the following described stock, on account of assessment (No. 36), levied March 4th, 1873, the several amounts set opposite the names of the respective shareholders as follows:

Names.	No. Certificate.	No. Shares.	Amount.
T D Mathewson.....	3	300	\$450 00
T D Mathewson.....	4	314	471 00
T D Mathewson.....	5	560	840 00
T D Mathewson.....	17	25	39 00
T D Mathewson (not issued)		325 6-7	487 50
J H Fish.....	342 6-7	574 29	
J H Fish, Trustee.....	20	50	75 00
J H Fish, Trustee.....	21	50	75 00
J H Fish, Trustee.....	22	50	75 00
J H Fish, Trustee.....	23	50	75 00
M E B Fish.....	9	1000	1500 00
R M Anthony.....	18	100	150 00
R M Anthony (not issued)		45 5-7	68 50
R M Anthony.....	18	60	90 00
E H Sawyer.....	11	800	1200 00
E H Sawyer (not issued)		228 4-7	342 88
Geo. Osgood.....	12	400	600 00
Geo. Osgood (not issued)		110	165 00

And in accordance with law and an order made by the Board of Directors, on the 4th day of March, 1873, so many shares of each parcel of said stock as may be necessary, will be sold at public auction, at the office of Messrs. Dore & Co., 327 Montgomery street, San Francisco, Cal., on Monday, April 21st, 1873, at 2 o'clock P. M., of such day, to pay said delinquent assessment thereon, together with costs of advertising and expenses of sale.

Office, Room No. 1, 408 California Street, San Francisco, California (up stairs). m3-3t

POSTPONEMENT.—Angels Quartz Mining Company. The above sale is hereby postponed for thirty days, at the same hour and place.

ap19 GEORGE CONGDON, Secretary.

The Central Land Company—Principal place of business, 338 Montgomery street, Room 5, San Francisco, Cal.

Notice is hereby given, that at a meeting of the Board of Directors, held on the ninth day of April, 1873, an assessment of fifty (50) cents per share was levied upon the capital stock of the Corporation, payable immediately in United States gold and silver coin, to the Secretary, at 338 Montgomery street, Room 5, San Francisco, Cal. Any stock upon which this assessment shall remain unpaid on the 10th day of May, 1873, will be delinquent and advertised for sale at public auction, and unless payment is made before, will be sold on Saturday, the 31st day of May, 1873, to pay the delinquent assessment, together with costs of advertising and expenses of sale.

F. B. HASWELL, Secretary of the Central Land Company, Office, 338 Montgomery street, Room 5, San Francisco, Cal. m3-4t

Equitable Tunnel and Mining Company, Location of works, Little Cottonwood District, Utah Territory.

Notice is hereby given, that at a meeting of the Board of Directors, held on the fifth day of May, 1873, an assessment of twenty (20) cents per share was levied upon the capital stock of the Corporation, payable immediately in United States gold and silver coin, to the Secretary, at the office of the Company, No. 35 New Merchants' Exchange, San Francisco, California. Any stock upon which this assessment shall remain unpaid on the 10th day of June, 1873, will be delinquent and advertised for sale at public auction, and unless payment is made before, will be sold on Monday, the 24th day of June, 1873, to pay the delinquent assessment, together with costs of advertising and expenses of sale. By order of the Directors.

Office, No. 35 New Merchants' Exchange, San Francisco, Cal. m3

Eagle Quicksilver Mining Company—Location of works, Santa Barbara County, California.

Notice is hereby given, that at a meeting of the Board of Trustees of said Company, held on the 18th day of January, 1873, an assessment of thirty dollars (\$30) per share was levied upon the capital stock of said Company, payable immediately in United States gold and silver coin, to the Secretary, at the office of the Company, No. 35 New Merchants' Exchange, San Francisco, California. Any shares upon which said assessment shall remain unpaid on Wednesday, March 19th, 1873, shall be deemed delinquent, and will be sold at public auction, and unless payment is made before, will be sold on Monday, the 24th day of March, 1873, to pay the delinquent assessment, together with costs of advertising and expenses of sale. By order of the Board of Trustees.

Office, Room 5 and 6, No. 302 Montgomery street, San Francisco, Cal. m25

POSTPONEMENT.—The day for deeming shares delinquent on the above assessment is hereby postponed until Thursday, the 24th day of April, 1873, and the sale thereof until Monday, the 28th day of April, 1873, at the same hour and place. By order of the Board of Directors.

WM. H. WATSON, Secretary. m22

POSTPONEMENT.—The day for deeming shares delinquent on the above assessment is hereby postponed until Thursday, the 24th day of May, 1873, and the sale thereof until Monday, the 28th day of May, 1873, at the same hour and place. WM. H. WATSON, Secretary. April 26, 1873.

Frear Stone Company of California—Location of principal place of business and works, City and County of San Francisco, California.

Notice.—There are delinquent upon the following described stock, on account of assessment (No. 5) levied on the 1st day of April, 1873, the several amounts set opposite the names of the respective shareholders as follows:

Names.	No. Certificate.	No. Shares.	Amount.
Booth, Lucius A.....	11	405	\$10 00
Booth, Lucius A.....	12	45	90 00
Emery, J. B.....	34	450	900 00
Perine, N. P.....	64	50	100 00
Perine, N. P.....	65	50	100 00
Perine, N. P.....	67	50	100 00
Perine, N. P.....	68	50	100 00
Perine, N. P.....	69	50	100 00
Perine, N. P.....	70	50	100 00
Perine, N. P.....	71	50	100 00
Spaulding, N. W.....	15	405	810 00
Spaulding, N. W.....	16	405	810 00
Spaulding, N. W.....	20	45	90 00
Tripp, E.....	41	8	10 00
Wegener, R, Trustee.....	55	5	10 00
Wegener, R, Trustee.....	72	11	22 00
Wegener, R, Trustee.....	81	80	160 00

And in accordance with law, and an order of the Board of Directors, made on the 1st day of April, 1873, so many shares of each parcel of said stock as may be necessary, will be sold at public auction at the office of the Company, No. 414 California street, San Francisco, California, on Monday, the 26th day of May, 1873, at the hour of 1 o'clock P. M., of such day, to pay delinquent assessments thereon, together with costs of advertising and expenses of the sale.

Office, No. 414 California street, San Francisco, Cal. m10

Hardy Coal Mining Company—Location of principal place of business, San Francisco, Cal.

Notice.—There are delinquent upon the following described stock, on account of assessment levied on the 26th day of March, 1873, the several amounts set opposite the names of the respective shareholders as follows:

Names.	No. Certificate.	No. Shares.	Amount.
Warren Goodale.....	37 (old)	94	\$659 30
Edward McLean.....	1	36	36 00
Edward McLean.....	2	52	62 00
Edward McLean.....	6	41	41 00
Edward McLean.....	24	100	100 00
Edward McLean.....	23	50	60 00
Edward McLean.....	23	50	60 00
Edward McLean.....	24	150	150 00
Edward McLean.....	33	2	2 00
Edward McLean.....	35	4	4 00
Edward McLean.....	37	46	46 00
O S Kittbridge.....	35 (old)	4	4 00
E O Leary.....	15	12 1/2	50 00
Jacob Hardy.....	10	100	100 00
Jacob Hardy.....	12	10	10 00
Jacob Hardy.....	21	85	85 00
Jacob Hardy.....	31	8 1/2	8 50
Jacob Hardy.....	38	15	15 00
Jacob Hardy.....	40	2	2 00
Jacob Hardy.....	41	2	2 00
Jacob Hardy.....	25 (old)	1	12 50
Jacob Hardy.....	28 (old)	1	12 50
Jacob Hardy.....	29 (old)	1	12 50
M H Eastman.....	28	45	45 00
M H Eastman.....	28	55	55 00
M H Eastman.....	30	50	50 00
Barliatt & Wilcox.....	33 (old)	30	312 50

And in accordance with law, and an order of the Board of Directors, made on the 26th day of March, 1873, so many shares of each parcel of said stock as may be necessary, will be sold at public auction at the Company's office, Room 5, No. 338 Montgomery street, San Francisco, Cal., on the 24th day of May, 1873, at the hour of 12 o'clock M., of such day, to pay said delinquent assessment thereon, together with costs of advertising and expenses of sale.

JACOB HARDY, Secretary pro tem. Office, Room 5, No. 338 Montgomery street, San Francisco, Cal. m3

Heckerdorn G. and S. M. Co.—Stockholders' Meeting.

Notice is hereby given to the stockholders of the Heckerdorn G. and S. M. Co., for the election of Trustees and the transaction of such business as may be presented, will be held on Thursday, May 29th, 1873, at 2 o'clock P. M., at the office of the Company, No. 510 Jackson street, San Francisco, California.

LOUIS TERME, Secretary, May 7th, 1873.

Kincaid Flat Mining Company—Principal place of business, San Francisco, Cal. Location of works, Tuolumne County, State of California.

Notice is hereby given, that at a meeting of the Board of Directors, held on the 8th day of May, 1873, an assessment of two dollars per share was levied upon the capital stock of the Corporation, payable immediately in United States gold and silver coin, to the Secretary, at the office, No. 217 Sansome street (up stairs), San Francisco, Cal. Any stock upon which this assessment shall remain unpaid on the 9th day of June, 1873, will be delinquent and advertised for sale at public auction, and unless payment is made before, will be sold on Wednesday, the 24th day of June, 1873, to pay the delinquent assessment, together with costs of advertising and expenses of sale.

Office, No. 314 California street, San Francisco, California. m10

Newton Booth Consolidated Mining Company—Location of principal place of business, San Francisco, California. Location of works, Ely District, Lincoln County, Nevada.

Notice is hereby given that at a meeting of the Directors, held on the 14th day of May, 1873, an assessment of fifty cents per share was levied upon the capital stock of the Corporation, payable immediately in United States gold coin, to the Secretary, at his office, No. 314 California street, San Francisco. Any stock upon which this assessment shall remain unpaid on the 14th day of June, 1873, will be delinquent and advertised for sale at public auction, and unless payment is made before, will be sold on the 24th day of July, 1873, to pay the delinquent assessment, together with costs of advertising and expenses of sale.

LOUIS FRANCONI, Secretary. Office, No. 314 California street, San Francisco, California. m10

Office Newton Booth Consolidated Mining Company—NOTICE TO STOCKHOLDERS.

Some irregularities having occurred in the levying, advertising and collecting of the assessment levied on the 10th day of February, 1873, said assessment being of 25 cents per share on the capital stock of the Newton Booth Consolidated Mining Company, notice is hereby given, that at a meeting of the Directors of said Company, held on the 7th day of May, 1873, said assessment levied on the said 10th day of February, 1873, has been rescinded, and another assessment of 50 cents per share has been levied in lieu thereof. Any one having paid the assessment levied February 10th, 1873, shall be credited for the amount paid on account of the assessment levied this day.

LOUIS FRANCONI, Secretary. San Francisco, May 7th, 1873.

Omega Table Mountain Mining Company, Location of works, Tuolumne County, California. Location of principal place of business, San Francisco, Cal.

Notice is hereby given, that at a meeting of the Board of Directors, held on the 8th day of April, 1873, an assessment (No. 1) of five cents per share was levied upon the capital stock of the Corporation, payable immediately in United States gold and silver coin, to the Secretary, at No. 25 Merchants' Exchange, San Francisco, California. Any stock upon which this assessment shall remain unpaid on the 10th day of May, 1873, will be delinquent and advertised for sale at public auction, and unless payment is made before, will be sold on the second day of June, 1873, to pay the delinquent assessment, together with costs of advertising and expenses of sale. By order of the Directors.

DAVID WILDER, Secretary. Office, 25 Merchants' Exchange, California street, San Francisco, Cal. ap12-4t

Orient Silver Mining Company—Stockholders' Meeting.—San Francisco, April 21, 1873.

The Annual Meeting of the Stockholders of the Orient Silver Mining Company, for the election of Trustees and the transaction of such business as may be presented, will be held on Monday, May 12th, 1873, at one o'clock P. M., at the office of the Company, Room No. 25, Hayward's Building, 419 California street, San Francisco, California.

JOSEPH MAQUIRE, Secretary.

Phenix Silver Mining Company—Location of works, Eureka Mining District, Esmeralda County, Nevada. Principal place of business, San Francisco, Cal.

Notice is hereby given, that at a meeting of the Board of Directors, held on the 18th day of April, 1873, an assessment (No. 10) of twenty-five cents per share was levied upon the capital stock of the Corporation, payable immediately in United States gold and silver coin, to the Secretary, at the office of the Company, Room 25, Hayward's Building, San Francisco, Cal. Any stock upon which this assessment shall remain unpaid on the 24th day of May, 1873, will be delinquent, and advertised for sale at public auction, and unless payment is made before, will be sold on the 11th day of June, 1873, to pay the delinquent assessment, together with costs of advertising and expenses of sale. By order of the Directors.

JOSEPH MAQUIRE, Secretary. Office, Room 25, Hayward's Building, 419 California street, San Francisco, California. ap18

Rising Star Mining Company—Location of principal place of business, San Francisco, California. Location of works, Nevada County, California.

Notice is hereby given, that at a meeting of the Board of Directors, held on the 25th day of April, 1873, an assessment (No. 4) of six cents per share was levied upon the capital stock of the Corporation, payable immediately in United States gold and silver coin, to the Secretary, at the office of the Company, Room 37, New Merchants' Exchange, California street, San Francisco, California. Any stock upon which this assessment shall remain unpaid on the 24th day of June, 1873, will be delinquent and advertised for sale at public auction, and unless payment is made before, will be sold on the 16th day of June, 1873, to pay the delinquent assessment, together with costs of advertising and expenses of sale. By order of the Directors.

Office, 37 New Merchants' Exchange, California street, San Francisco, California. m3

The Sanderson Gold Mining Company—Location of works, Railroad Flat, Calaveras County, California.

Notice is hereby given, that at a meeting of the Board of Directors of said Company, held on the 5th day of May, 1873, an assessment (No. 4) of twelve cents per share was levied upon the capital stock of the Corporation, payable immediately in United States gold and silver coin, to the Secretary, at the office of said Company. Any stock upon which said assessment shall remain unpaid on the 24th day of June, 1873, will be delinquent and advertised for sale at public auction, and unless payment is made before, will be sold on Thursday, the 24th day of June, 1873, to pay the delinquent assessment, together with costs of advertising and expenses of sale. By order of the Board of Directors.

Office, 113 Laidlaw street, San Francisco, Cal. m10

Sierra Iron Company—Principal place of business, San Francisco. Location of works, Sierra and Plumas counties, California.

Notice is hereby given, that at a meeting of the Board of Directors, held on the 1st day of April, 1873, an assessment of one dollar per share was levied upon the capital stock of the Corporation, payable immediately in United States gold and silver coin, to the Secretary, at the office of the Company, Rooms 5 and 6, No. 606 Montgomery Street, San Francisco, California. Any stock upon which this assessment shall remain unpaid on the 10th day of May, 1873, will be delinquent, and advertised for sale at public auction, and unless payment is made before, will be sold on Tuesday, the third day of June, 1873, to pay the delinquent assessment, together with costs of advertising and expenses of sale. By order of the Board of Directors.

Office, Rooms 5 and 6, No. 606 Montgomery Street, San Francisco, California. ap12

Schell Creek Mining Company—Location of principal place of business, No. 304 California street, San Francisco, State of California. Location of works, Sierra Nevada Mining District, White Pine County, State of Nevada.

Notice is hereby given, that at a meeting of the Board of Directors, held on the 10th day of April, 1873, an assessment of one dollar per share was levied upon the capital stock of the Corporation, payable immediately in United States gold coin, to the Secretary, at the office of the Company, No. 304 California street, San Francisco, California. Any stock upon which this assessment shall remain unpaid on the 14th day of May, 1873, will be delinquent, and advertised for sale at public auction, and unless payment is made before, will be sold on Monday, the 24th day of May, 1873, to pay the delinquent assessment, together with costs of advertising and expenses of sale.

Office, No. 304 California street, San Francisco, Cal. ap18

Spring Mountain Tunnel Company—Location of works, Ely Mining District, Lincoln County, Nevada. Principal place of business, San Francisco, California.

Notice.—There are delinquent upon the following described stock, on account of assessment levied on the 13th day of March, 1873, the several amounts set opposite the names of the respective shareholders as follows:

Names.	No. Certificate.	No. Shares.	Amount.
J M Buffington, Trustee.....	233	100	\$20 00
J M Buffington, Trustee.....	236	100	20 00
J M Buffington, Trustee.....	237	100	20 00
J M Buffington, Trustee.....	238	100	20 00
J M Buffington, Trustee.....	250	50	10 00
J M Buffington, Trustee.....	163	50	10 00
Samuel Baird.....	248	100	20 00
James Baird.....	1180	200	40 00
F M Freund, Trustee.....	115	25	5 00
F M Freund, Trustee.....	188	25	5 00
F M Freund, Trustee.....	217	50	10 00
James Feeny.....	101	8	1 60
B M Gunn, Trustee.....	181	15	3 00
B M Gunn, Trustee.....	184	100	20 00
G E H Hall, Trustee.....	10	10	2 00
G E H Hall, Trustee.....	96	20	4 00
C W Lomler, Trustee.....	102	8	1 60
M B Martin, Trustee.....	189	38	7 50
F A Munroe, Trustee.....	33	25	5 00
F A Munroe, Trustee.....	322	945	69 00
Norbert Moser.....	167	50	10 00
J H Marston.....	233	100	20 00
A O Prince, Trustee.....	269	100	20 00
A O Prince, Trustee.....	299	250	50 00
Geo Phillips, Trustee.....	201	300	60 00
Geo Phillips, Trustee.....	202	100	20 00
Geo Phillips, Trustee.....	203	50	10 00
Geo Phillips, Trustee.....	204	50	10 00
G E H Hall, Trustee.....	267	50	10 00
W H Probst, Trustee.....	140	500	100 00
J T Pomeroy, Trustee.....	131	67	13 40
J T Pomeroy, Trustee.....	285	100	20 00
J T Pomeroy, Trustee.....	286	100	20 00
J T Pomeroy, Trustee.....	288	10	2 00
M Tubs, Trustee.....	208	85	17 00
M Tubs, Trustee.....	210	20	4 00
J Clem Uhler, Trustee.....	299	200	40 00
J Clem Uhler, Trustee.....	300	200	40 00
J Clem Uhler, Trustee.....	301	200	40 00
J Clem Uhler, Trustee.....	302	200	40 00
J Clem Uhler, Trustee.....	304	100	20 00
J Clem Uhler, Trustee.....	306	100	20 00
G D Wyman, Trustee.....	21	65	1 30
G D Wyman, Trustee.....	97	51 1/2	10 26 1/2
Andreas Zihl.....	116	15	3 00

And in accordance with law and an order of the Board of Directors, made on the 13th day of March, 1873, so many shares of each parcel of said stock as may be necessary, will be sold at public auction, at the office of the Company, Room 37 New Merchants' Exchange, California street, San Francisco, California, on Monday, the 12th day of May, 1873, at the hour of 1 o'clock P. M. of said day, to pay said delinquent assessment thereon, together with costs of advertising and expenses of sale.

J. M. BUFFINGTON, Secretary. Office, Room 37 New Merchants' Exchange, California street, San Francisco, California. ap28-3t

Swansea Mining Company—Location of works, Kelsey Mining District, El Dorado County, State of California. Principal place of business, San Francisco, California.

Notice.—There are delinquent upon the following described stock, on account of assessment (No. 1) levied on the 28th day of March, 1873, the several amounts set opposite the names of the respective shareholders as follows:

Names.	No. Certificate.	No. Shares.	Amount.
Ira O Holt.....	5	8,000	\$160 00
S B Brooks.....	7	8,000	160 00
H O Kibbe.....	9	3,000	75 00
Cline & Franks.....	10	2,000	50 00
Washington Ayer.....	11	2,000	50 00
Oeo L Bradley, Trustee.....	13	1,000	25 00
Fitch & Haggis.....	23	3,000	75 00

Machine Builders.

ESTABLISHED 1851.

PACIFIC IRON WORKS,

First and Fremont streets,

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Quartz, Flour and Saw Mills,

also Improved Steam Pump, Brodie's Improved Crusher, Mining Pumps, Amalgamators, and all kinds of Machinery.

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INCORPORATED.....APRIL 30, 1863.
CAPITAL.....\$1,000,000.

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Manufacturers of Steam Engines, Quartz and Flour Mill Machinery, Steam Boilers (Marine, Locomotive and Stationary), Marine Engines (High and Low Pressure). All kinds of light and heavy Castings at lowest prices. Oams and Tappets, with chilled faces, guaranteed 40 per cent. more durable than ordinary iron.

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JOSEPH MOORE.....Vice-President and Superintendent
LEWIS E. MEAD.....Secretary
24v17-47

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Machinery and Castings of all kinds.

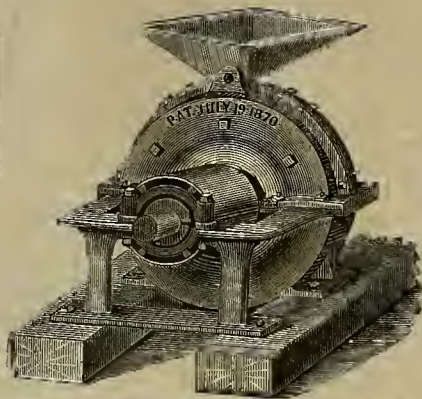
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Cheapest and Best
Hydraulic Machine
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The only reliable party in the Hydraulic business who protects his patrons.
9v23-4f Address F. H. FISHER, Nevada, Cal.

HYDRAULIC MINERS, TAKE NOTICE—I hereby caution Miners and Manufacturers against making, buying, selling or using a Hydraulic Machine or Joint known as the Little Giant, manufactured and sold by R. R. & J. Craig and Richard Hoskin, as the same is an infringement upon the invention of the machine known as FISHER'S HYDRAULIC CHIEF, secured by Letters Patent, No. 110,222, dated Dec. 20, 1870. All parties participating in such infringements will be vigorously prosecuted. Nevada, Jan. 13th. F. H. FISHER.

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For Pulverizing Quartz,

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Patent Bone Mills and Crushers.

For Grinding Bones, Rock, Quarz, and all hard substances; also, Corn, Wheat, Oats, Barley, Coffee, Spices, etc.

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Particular attention paid to making superior Shoes and Dies. Among the special castings of this Foundry are the well known CALLAHAN GRATE BAR, of superior merit for burning screenings—all size Bars. STRATTON'S JACK SCREWS, all sizes. Superior, compact and effective Horse Powers, Pumps, Agricultural Castings, Ingot Moulds, Assaying and Refining Retorts and Kettles, and a great variety of other and special castings.

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Steiger & Boland are the sole Manufacturers of the Improved Hepburn Roller Pan. The patterns having all the improvements to those Pans, are at the Occidental Foundry, enabling the Establishment to deliver all pans and parts thereof with uniformity, finished in the best style, and at the lowest possible price. Pan Castings furnished the trade, with liberal facilities for erection, &c. All persons are cautioned against making, selling or using these Pans, except through the authorized agents and manufacturers, viz., Steiger & Boland, of the Occidental Foundry, S. F.

22v25-3m WM. H. HEPBURN.

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Every Description of Ornamental Work,
Stove and French Range Work, grate and fender work, small machines of all descriptions, house work, etc., promptly attended to.
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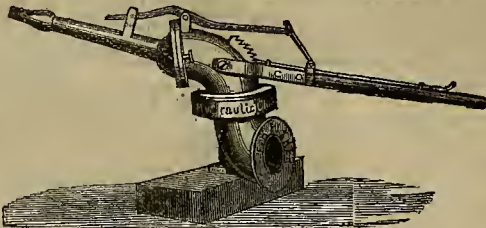
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TO ORDER,
to throw from
One
to an
eight-inch
STREAM.

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The inventor having perfected and tested the durability and capacity of these Batteries to his entire satisfaction, is now ready to manufacture and guarantee them. Parties who want of a Battery cannot find their equal in regard to PRICE, WEIGHT, CAPACITY, POWER TO RUN THEM. State and County Rights for Sale by

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17v26-4f 315 California street, San Francisco.

Notice is hereby given, that the copartnership heretofore existing between A. J. Severance, Charles W. Randall and J. Gus. Burt, under the firm name of "Severance, Holt & Co.," is this day dissolved by mutual consent. A. J. Severance, having purchased all the interest of his late partners, will continue the business of manufacturing and selling Diamond Drills as before, under the style of A. J. Severance & Co. Dated San Francisco, Nov. 24, 1871. Office, 315 California street. A. J. SEVERANCE, CHAS. W. RANDALL, J. GUS. BURT.

22-v23-4f

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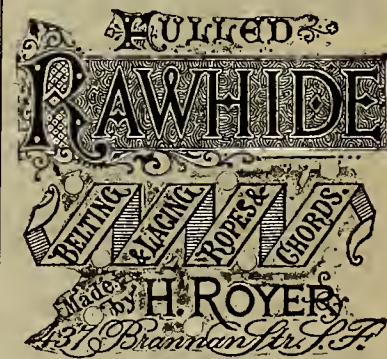
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Plans and estimates furnished upon application. Repairs upon all kinds of Machinery promptly made, and at moderate charges. Having unrivalled facilities, we are prepared to make to order, at short notice, anything required in our line. Specimens of our work may be seen in all the mining regions on this coast.

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NARROW GAUGE AND MINE LOCOMOTIVES A SPECIALTY.

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Letter of Recommendation.

Ma. C. B. BROWN—SIR: Your Patent Lamp for lighting hydraulic mines, which you sold to me in December last, has given entire satisfaction, and far exceeds my expectations, and I think it the best and cheapest light ever used to light mining claims by night, and am satisfied that I have saved three hundred dollars by the use of it in the last mining season over pitch or any other light of the same brilliancy; and I will also say that if I could not get another lamp, five hundred dollars would not buy it. Yours,

W. D. APLIN.

Little York, Nov. 5, 1872.

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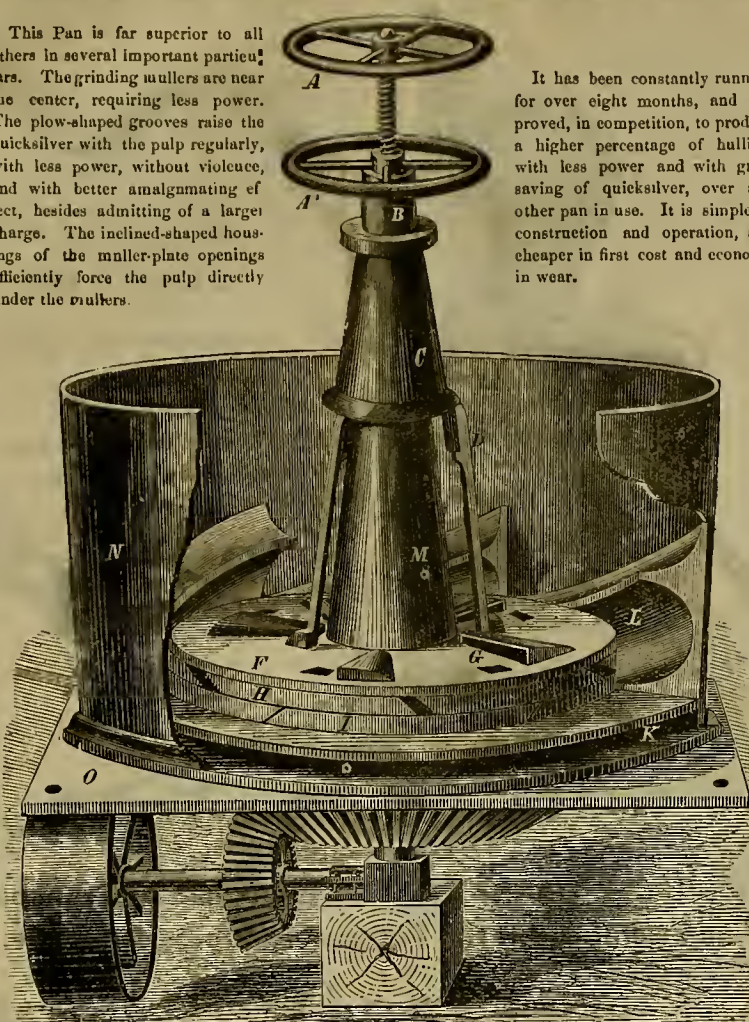
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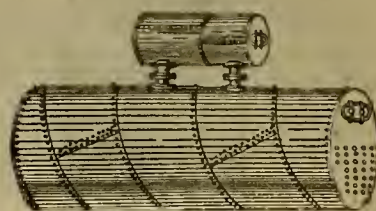
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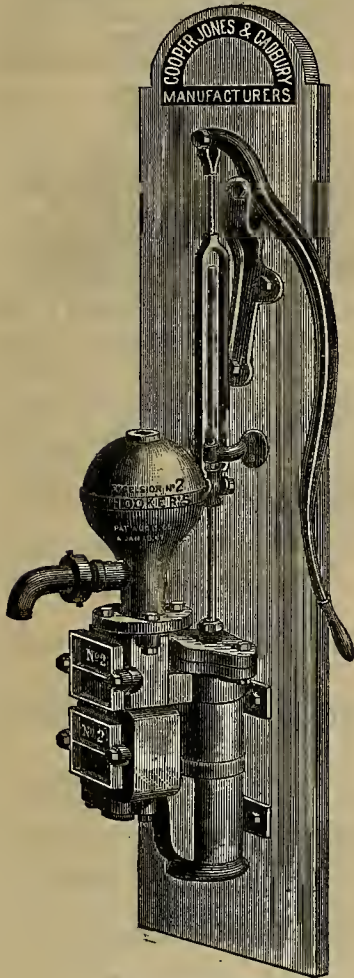
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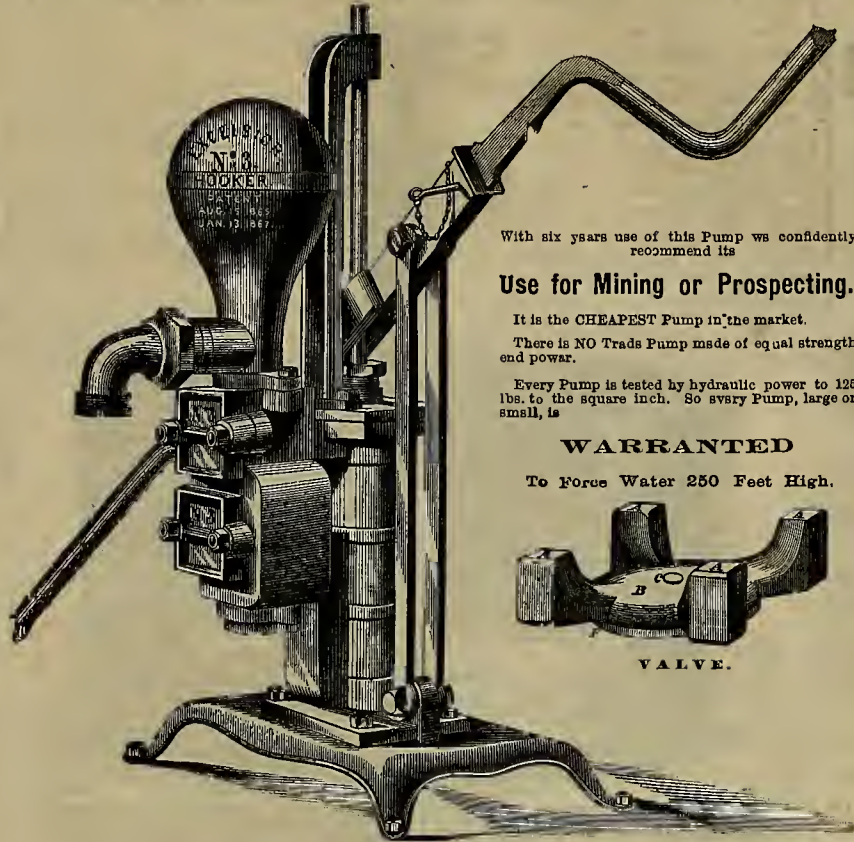
Office, corner Fourth and Townsend streets, San Francisco. Send for sample card and price list. 16v23-3mewhpb HEALY & JEWELL, Agents.

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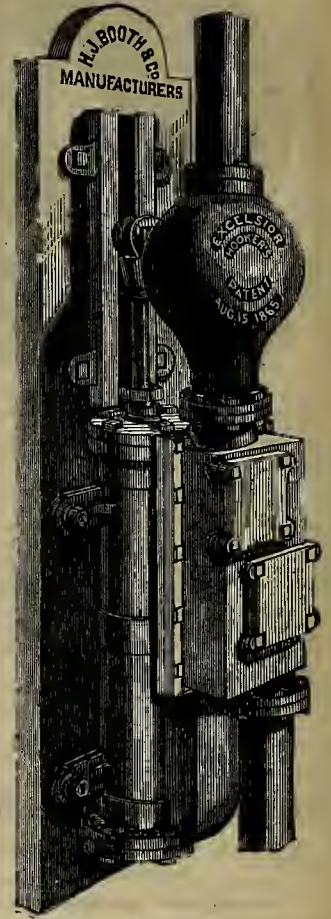
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2.00 P. M. (Sundays excepted). Stockton Steamer (from Broadway Wharf), touching at Benicia, and Landings on the Sea Joaquin river.

3.00 P. M. (Daily). San Jose Passenger Train (via Oakland), stopping at all way Stations.

4.00 P. M. (Sundays excepted). Passenger Train (via Oakland) for Lathrop, Merced, Visalia, Tipton, and Los Angeles, Stockton and Sacramento.

4.00 P. M. (Sundays excepted). Cal. P. R. R. Steamer (from Broadway Wharf) connecting at Vallejo with Trains for Callisto, Knight's Landing and Sacramento.

4.00 P. M. (Sundays excepted). Sacramento Steamer (from Broadway Wharf), touching at Benicia, and Landings on the Sacramento river.

6.30 P. M. (Daily). Overland Emigrant Train (via Oakland)—Through Freight and Accommodation.

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LEAVE STOCKTON (for San Francisco), 5.30, 8.40, 7.50, 9.00 and 11.00 a. m., 1.30, 2.40, 4.55, 6.10, 7.55 and 10.10 p. m.
LEAVE OAKLAND, 5.40, 6.50, 8.00, 9.10, 10.00, and 11.10 a. m., 12.00, 1.40, 2.50, 3.50, 5.05, 6.20, 8.05 and 10.20 p. m.
ALAMEDA BRANCH.—LEAVE SAN FRANCISCO, 7.20, 9.00 and 11.15 a. m., 1.30, 4.00, 5.30, and 7.00 p. m. (7.20, 11.15 and 5.30 to Fruit Vale only).
LEAVE HAYWARDS (for San Francisco), 4.30, 7.00 and 10.45 a. m., and 3.30 p. m.
LEAVE FRUIT VALE, 5.25, 7.55, 9.00 and 11.20 a. m., 1.30, 4.05 and 6.30 p. m.
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The system of transporting material, such as Ore, from the mine to the mill, Earths for embankments, Rock from quarries, etc., by means of steel wire rope, has been well tested and found more economical, advantageous and reliable than any other method of transportation; and to the annexed certificates in connection therewith I beg to call the attention of those interested:

EUREKA, Nevada, July 10, 1872.

T. M. MARTIN My dear sir: On your leaving for San Francisco, it gives me great pleasure to hand you my written acceptance of the HALLIDIE TRAMWAY put up by you upon our mine in Frohburg.

It is a perfect success, discharging ten tons of ore per hour with two men's labor. It is perfectly simple in construction, and, as far as I can judge, there is nothing about it to sever get out of order—nothing to wear out. While ours requires but about two thousand five hundred feet of wire rope, I can see no reason why the line could not be extended almost indefinitely with equally happy results. Again, the carrying capacity might be doubled or quadrupled if desired. After several weeks trial upon our mine, the unanimous verdict of all who have seen it is a complete, unquestioned success. If this can be of any service to you, use it in any way you think proper. Very respectfully, C. C. GOODWIN.

EMMA HILL CONSOLIDATED MINING CO.,
Little Cottonwood, Utah.

Superintendent. Other Sept. 2, 1872.
T. M. MARTIN, Esq., Sir: The Ropeway constructed by you (HALLIDIE'S PATENT) for the Emma Hill Consolidated Mining Company, has been built in a most substantial and workmanlike manner, and is at this time in splendid working condition. I most cheerfully accept the work for the Company, and recommend it to others wishing a sure and speedy transit for ores over places impracticable for wagon roads, etc. Respectfully,
L. W. COLBATH, Superintendent.

"The Vallejo works smoothly with the elevated wire tramway, which carries its load of ore as quietly and easily as if there was no winter or snow in the world."

"Whatever the objections to wire tramways may be on account of their cost, I have seen nothing yet that even approaches them in the facilities they afford for moving ore at all seasons of the year."—Correspondent Utah Mining Journal, Alta, Jan. 8, 1873.

The Vallejo Ropeway.

The Vallejo Tunnel Company's Tramway in Little Cottonwood, built on the HALLIDIE PATENT PLAN, is a complete success. It is between 2,500 and 3,000 feet in length, and is supported by thirteen stations. The fall in this distance is about 600 feet, and the wire rope, which is three-fourths of an inch in diameter, will easily deliver one hundred tons in six hours. The machinery is automatic, loading and unloading the sacks or buckets. About one ton and a half can be sent down at one time. The stations are about two hundred feet apart, and the apparatus is strong and safe. As the wire rope is elevated about forty feet above the surface of the hill, the Tramway can be worked all winter long, without the slightest trouble. —Utah Mining Journal, Salt Lake, Sept. 23, 1872.
Mining Companies and others desiring to negotiate for the erection of this system of Ropeway, can communicate with me personally, or through Postoffice Box 964.

A. S. HALLIDIE, Patenteo,

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MINING AND SCIENTIFIC PRESS.

An Illustrated Journal of Mining, Popular Science and Progressive Industry.

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SAN FRANCISCO, SATURDAY, MAY 17, 1873.

VOLUME XXVI.
Number 20.

The Labor School Movement.

The old idea that labor and study are incompatible has already become fully exploded; and that other error—that what we learn from books alone is education, while that which is learned by practice in a shop, is a trade and not education, is also fast becoming obsolete. A people's degree of civilization has come to be measured by what they know of the useful arts, rather than by their scholastic distinction or drawing-room politeness. Civilization is a sequence of wealth; and wealth in those latter days, comes of a knowledge of the industrial arts—that knowledge which enables man to bring to his aid those forces and machines which multiply his capacity for production, and gives him an increased control over nature.

The exercise of the industrial arts is but the application of science; and hitherto the scientist has considered his work done when he has developed a principle, deeming it beneath his profession to make the practical application of that which he has wrested from the secret archives of nature. That has been left to the mechanic. Even the application of science to engineering has, until recently, been considered an inferior and secondary matter unworthy of the attention of the scientist. It would never do for the professor or the scientist to blacken his hands or soil his garments in the shop; oh, no! Even the students in our technical schools, connected with classical departments, were, until recently, quite unwilling to don their overalls and jackets in the presence of their classical companions.

But this state of things is fast disappearing, and men are beginning to be judged rather by their achievements than by their acquirements. Indeed the day is not distant, when, as has been tersely expressed, "the classical student, who will not be seen walking with the dirty mechanic, can go behind."

The line of social distinction between the man who thinks and he who works—provided he works intelligently—is already pretty well broken down; the two are engaged simply in different branches of the same pursuit, which have such correlation and intimate connection, as lead ultimately to a single line, interlinked in the one great chain of human knowledge.

So intimate is the connection between labor and science that the time is fast approaching when the trades, as well as professions, will be taught in schools and universities; the earning a trade or learning a profession will be considered equally honorable. Learning a trade is no drawback in time to acquiring an education.

On the contrary, experience is proving that the education is all the better and sooner obtained in connection with some manual labor; while the physical condition is vastly the gainer. Nor need the trade with an education be much, if any, more costly than when learned in the shop exclusively. In a trade, acquired in connection with a school or college, the applied sciences will be found as valuable as the tools of the workshop in almost every operation involving movement, composition of material, etc., and will place the possessor so far in advance of his brothers of the trade, who have graduated from the shop alone, that his services would always command a much higher price, and put to utter naught any possible interference of cheap, uneducated labor with his interests as a workman.

Not, however, until our established schools and colleges, offer such advantages as are not at command in ordinary machine and other

shops, can we hope to reap the advantages indicated. Labor schools should be as free and easy of access as the common schools, and should be graded in like manner, with the State University at the head. These are no utopian ideas. The system is already at work in Europe, and to some extent in the Eastern States.

It is to be hoped that the labor school movement, just initiated in this city, will not stop short of the point herein indicated. In no part of the country is such a movement more practicable than right here in San Francisco; and with wise management the "Mechanics' Deliberative Assembly," may not only establish "a system of labor schools, to enable boys and girls to learn a trade as a part of their education in the common schools," but they may also graft the same upon our entire common school system, by gradations which shall take the pupil up to the highest grade of education in both the sciences, and mechanical and engineering arts.

The trustees of Girard College, at Philadelphia, have already taken the initiatory steps in such a movement, and propose to teach their pupils how to work with their hands as well as with their brains. The classes there work two hours in the morning and two in the afternoon, and, as a matter of encouragement, the boys are allowed a moderate recompense for their services. A turn at the work bench for a boy is found to be an agreeable relaxation from the mental strain of the school-room.

The faculty of mechanic arts at the Cornell University have also just completed arrangements for a similar practice at that institution. Hereafter all students in the course of mechanic arts there will be required to take at least ten hours shop practice per week, under the supervision of a skillful master mechanic. It is intended to combine thorough practical instruction in the shop with the theoretical instruction of the lecture-room, thus making it possible for the graduates from that department if they so desire to enter at once upon the active duties of practical journeymen, which, instruction by text books and models, as heretofore has been the practice, would not enable them to do.

With such a course of instruction the degrees conferred will hereafter mean something more than the mere capacity to theorize. It is well known that the first eighteen months of an apprentice are usually occupied in mere drudgery—servitude in which he learns nothing, and which may as well be performed by the common laborer or helper, who has no aspirations for anything higher. At the school this lost time is saved, and every hour of available time is directly applied either to the practical acquisition of his trade or to the philosophy and theory upon which it is founded. Such an education enables the young man to take his place at once among the best mechanics in the country, and to stand side by side the equal and superior, even; of the mere professional man.

In the division of time in such schools, five to six hours are sufficient for active daily study, while four can be given to labor, which will leave enough for amusement, social intercourse and sleep.

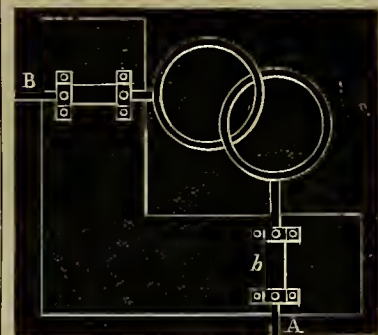
We have called attention in the PRESS to such a plan as this time and again, for several years past, and feel to rejoice that a movement has finally been set on foot which may lead to all the benefits capable of flowing out of such a system of study conjoined with labor.

NEW SILK FACTORY.—The Union Pacific Silk Manufacturing Company will have their factory running within a month or six weeks. They have erected a factory in Visitation Valley, 262 x 50 feet with a separate engine and dye house 160 x 30 feet. It is proposed to manufacture ribbons from the raw material imported here from China and Japan.

The Columbus Mill at Austin, is turning out \$1,200 of bullion per day.

Mechanical Movement.

The accompanying cut represents a new form of Hooke's Joint, as recently shown in the *English Mechanic*. Take two rings, and connect them as shown in the engraving. If the shafts



of these links are now placed in the bearings *b*, so that it will be impossible for them to slip, the rotation of the shaft *A*, will be communicated to the shaft *B*.

Hodge's Anti-Friction Roller for Endless Chain Horse-Power.

We illustrate, herewith, an improvement in endless chain horse-power, invented by Geo. C. Hodge, of North Danville, Vermont, which has received high encomiums, and has, by practical test, proved itself to be valuable.

The improvement was awarded the diploma and premium, at the Vermont State Fair, in 1872. It was patented March 5, of the same



year, and has been described in the *American Artisan*.

Heretofore, each deck has been supplied with one string of rollers, of sufficient length to enclose the entire deck and its supports. The disadvantages of this construction is, that these long strings of rollers have too much lateral play. They therefore deviate and crowd against the sides of the channel in which they run, carrying the endless chains of the lags against the sides, and creating much wear and friction.

The improvement consists in strings of rollers made in sections, by which the disadvantages named is obviated. In the engraving, the roller deck is constructed with side pieces, *a*, and a center piece, *b*, all running lengthwise. On each side of the center piece are channels, *c*, in which the sectional strings of rollers *d* and *e* run, each string inclosing a support resting upon the upper edges of the side and center pieces, *a* and *b*. These sectional strings of rollers are made so wide that they cannot deviate sufficiently to crowd on either side of their channels. Each section is placed beside the gap between other sections, thus connecting the endless chain to the several sections.

Machines, with improved roller deck attached, are manufactured at North Danville, by the inventor. State rights will be disposed of. For further information the patentee may be addressed as above.

BINGHAM CANON MINES exhibit encouraging prospects for a successful season. The grading on the proposed railroad is nearly completed and many new discoveries are reported.

TRIAL OF BLOWERS.—We have been shown the report of a very interesting trial between the Sturtevant and Root's Blower, to test the relative capacity of these two blowers for doing the work required of them. The trial was made at the Tilgman Sand Blast Company's Works, at South Boston, on the 24th of March last. The test was in reference to the power required to maintain a pressure of nineteen inches of water in the blast pipe, and was made under the supervision of Prof. F. W. Bacon, consulting Engineer of the above company's works, where both blowers are employed. The result of the test, as reported by Prof. Bacon, were that while the pressure named was maintained with the Root Blower at the expenditure of only 5.14 horse power; the power required to keep up the same pressure with the Sturtevant Blower, indicated 10.41 horse power.

The Root Blower is largely employed in this State, where great numbers of them are employed, and we understood that they have recently been very successfully introduced in England. W. T. Garratt, corner of Fremont and Natoma streets, is agent for the Root Blower on this coast.

CINCINNATI INDUSTRIAL EXPOSITION.—The Fourth Industrial Exposition at Cincinnati, will open on September 3d and continue until the 4th of October. It will be held in a building especially erected in the heart of the city, presenting an available exhibition space of 338,000 square feet or nearly eight acres under roof, constituting the largest exposition ever held in the United States. Parties who propose to exhibit articles will be furnished upon application by mail to A. T. Goshorn, President or W. W. Taylor, Secretary, with a pamphlet containing the premium list and full instructions to exhibitors. All applications for space must be made on or before the 20th of August, on the printed blank forms which will be furnished by the Secretary, and applicants after that date will not be allotted space until those entered by August 20th have been assigned. Space allotted to applicants and not occupied by them on or before August 20th, may be assigned to others.

PICOCHE MINES are leaving that camp in numbers, but others are taking their places rapidly. The *Record* thinks that many who are leaving will wish themselves back within 60 days. It seems strange that men who have held out at Pioche through hard, dull times should now leave just as better days are coming. Many new buildings are being erected at Pioche, a feature which evinces faith in the permanence of the mines. The *Record* says there is no ground for the report that the Raymond & Ely vein is pinching out on the lowest levels. The present activity in Pioche is thought to be due more to the result of several rich strikes in the camps than the activity in the stock market. There has been recently a more decided improvement in business than has prevailed for months.

CROWN POINT MINE.—During the month of April, the Crown Point mine turned out 14,443 tons of ore averaging, \$82.11 per ton, or \$1,185,920. Most of this ore came from the lower levels of the Comstock lode which speaks well for the permanence of the mining interests in that section of country. The mills are all busy at Washoe and a prosperous summer is expected.

A MEETING has been held in Los Angeles by parties interested in organizing a stock company to build a refinery for reducing crude borax.

CORRESPONDENCE.

Mining in Mexico Improving.

EDITORS MINING AND SCIENTIFIC PRESS:—It has been some two years since I wrote last, since then mining has come up finely, due to the introduction of American stamp mills principally, whereby low grade ores of \$80 per ton and upwards are successfully treated. The following mills are now in operation at Rosario the Tajo mill of 20 stamps is running to its full capacity, the mine doing well also. Sinking a new shaft 600 feet to intersect the vein; new hoisting works going up over it and a tailing mill. At Guadalupe de los Reyes the 20-stamp mill, producing \$80,000 or \$90,000 per month, burned down, but a new one will go up immediately. The new pumping works are nearly ready. In Coahuila the Cuatro Señores mine in bonanza. They are working their ore in a leased mill, but are to erect a new 20-stamp mill, etc.

At San Dimas the 10-s amp mill of the American Co. has just started up and works well. Roasting furnaces are used here.

In Ventanas a 5-stamp mill has started up; result unknown yet. At Chapote the Tomanil mine is undergoing consolidation previous to the erection of a 10-stamp mill, or perhaps a 20. Sr. D. Vicente Lavaga, of San Francisco, is the operator in this business. At Panaco the Mechado family are going to erect a mill for their Mina Grande. They are one of the influential Mexican families of that section.

In San Vicente District the mines are looking well, and ores of ordinary base mines are being hauled to the San Dimas District for reduction in the mill there.

Inside of two years there will be a great impulse in mining in these districts and some others near at hand.

All the abandoned mills of "62" are being repaired and worked. The impulse will be a healthy reaction and not a fever, and no country has better mines for such a reaction to work upon than Mexico.

All that is needed is the completion of the net-work of railroads now commenced.

We are busily "pegging away," and by-and-by" we will drop you some more lines.

Yours truly,
VALVERDE.
SAN DIMAS, State of Durango, Mexico, April 20th, 1873.

Wages and Labor in San Francisco.

The prosperity of every country, says the *Cull*, is truly measured by the condition of its working classes; and the rewards obtained for labor are so many indices on its social thermometer, so to say, by which may be measured its commercial and industrial status. The truth of this is manifested by the experience of century after century; its tests are world-wide. Amongst the countries of Europe, there is none whose commercial and industrial pulse beats more healthily than that of England; none whose wealth is greater, whose manufactures are so extensive and varied, and none whose workmen are so well paid. The United States, in this respect, is far ahead of the Old World. Here, to, prosperity is measured by the wages of the workman, who if he be at all economical, lives as well as does the middle-class tradesman of England. And California, where the wages paid to the mechanic and the laborer are greater than those current in the Eastern States, is, in proportion to its age and population, far in advance of any in the United States, save, perhaps, some of the new western ones of its own age, where the rewards of labor are fully as high. And while the wages earned in this city are in some instances rather low, in others they are such as would, in a few years, make capitalists of every one of them, if they practice economy in living. This, however, is not universally true; and some of the occupations given in the table at the conclusion of this article, are, when we consider that the employees are not constantly employed throughout the year—badly paid, even when measured by Eastern standards. These, however, are few in number. In the following article, we aim to give a correct showing as to the number of workmen and remuneration of

The Various Kinds of Labor,

Premising that there are not less than about 180 different manufactures, or other works, on which our army of labor is employed. This is a great number for a young city like San Francisco, and argues well for the future. In fact, to use a common saying, there is nothing, from a needle to an anchor, that San Francisco has not workmen competent to manufacture, had she the capital, or the market for these productions. And the enterprise of Californians has left but a few avenues to wealth untried. Some manufactures, however, have not prospered so favorably as they ought. First in order, and first in importance, comes the

Workers in Iron and Steel,

Who number nearly three thousand. In busy times every one is employed, and then all that portion of the city lying south of Market street and east of Second is alive with busy traffic, the workshops are full of cheerful toilers, who live amidst the clanging of hammers, the whizz and buzz of machinery, and the torrid heat of a hundred fires. When the furnaces of that portion of the city are aglow, when the mines are prosperous, and when there is a demand

for machinery and railroad iron from the foundries, machine-shops, boiler-shops, rolling mills, etc., they keep over thirteen hundred hands at work.

The Lumber Workers

Of our city number not less than 2,500, who, when business is brisk, are making doors, windows and sashes for this coast, the Islands and Australia, railroad cars and street cars for the coast, woodenware for our farmers and for domestic use, wine casks and vats to carry the products of our vintage to Europe and the East, boxes in millions for the vast demands of our trade, and frames for pictures, resplendent in gold, and more gorgeous than the pictures themselves. And this year some hundreds of shipwrights and caulkers were employed, not in building new ships as they should have been, but in repairing the old ones that came to carry away our grain.

The Workers in Leather

Number more than four thousand, of whom about two thousand are white, and the balance Chinese. The boot and shoe makers are probably the most independent body of men on the Pacific Slope, as the manufacture in which they are engaged has swelled to vast dimensions. After them come the tanners and curriers, who number over two hundred, and then the saddlers, harness and collar makers, who can muster, if they like over four hundred men. Taking these and the precedent workers in metals, lumber and leather from the roll of our manufacturers, there will be left of the

Thirteen thousand White Workers,

About seven thousand artisans, laborers, women and boys, employed in the various manufactures of this city, of whom two hundred and seventy are employed by our manufacturing jewelers, lapidaries, etc.; twenty-six hundred in helping to clothe the people of the city; three hundred and eighty in manufacturing beer and spirituous liquore, and over one thousand manufacturing articles of domestic economy. In miscellaneous manufactures over another thousand are absorbed; while it will surprise many to find that San Francisco contains nearly eight hundred persons employed in the printing and newspaper offices of the city. In

The Building Trades

There are something over a thousand persons constantly employed, of whom much the larger proportion are carpenters; the bricklayers, stone-masons, and stone-cutters who are not employed on the new Mint or the new City Hall, being few, indeed. For these last few months building has been to a very great extent enfeebled, and but few houses are now going up. This will probably be rectified in the course of the next few months, when the gold and silver paid for the wheat products will find its way into the pockets of producers and those whom they patronize. Then there will probably be a temporary scarcity of men in the building trades, for during the last year nearly all the unemployed ones found their way East, to St. Louis or Chicago.

The Wages Paid to White Labor

Differ very much in amount, as may be seen by a glance at the concluding table. Many of the same per diem appear very large, but in the majority of instances this is much reduced by the circumstance that these wages are paid only for a portion of the year. The emoluments of the workmen vary from \$2 to \$8 per day, the latter being paid to first-class watch-makers. The mechanic in the foundry and machine-shops receive from \$3 to \$5 per day, and the unskilled workmen, \$2 to \$2.50. But both these rates become very considerably reduced when the number of days worked is taken into account the mechanic then appearing to receive only from \$2.50 to \$2.80 per day, and the helper \$1.50 per day. The boiler-makers, last year, did better than their brethren of the foundries and machine-shops, mechanic having earned from \$4 to \$4.50 per day; and laborers from \$2.25 to \$2.50 per day; the averages being for the year for mechanics, \$2.91 to \$3.75, and those for the laborer being \$1.98. The mill hands, or those employed in the factories for the manufacture of doors, windows, etc., have been paid an average daily salary of \$4.50, while the laborers have been paid \$2 per day. The boot and shoemakers can earn, some of them, \$30 per week; but here again, idle time during the year reduces the earnings to \$4 or less per day. The wages made by saw-makers and billiard-turners, who do not lose a day, are very large—the former being not less than \$5 per day, and the latter \$5.50. In trunk-making some of the skilled artisans work for \$1.50 per day, that is, \$1.50 per day when divided amongst the whole number of days in the year. The helpers in the carriage and wagon building average only \$1.80 throughout the year. In the building trades all but the carpenters, average \$4 and \$5 per day—the carpenters are an exception, on account of their numbers, and because, in this city, every one who can handle a saw and a plane is dubbed a carpenter. Some watch-makers earn as much as \$3 per day, though the average for the whole is but \$5, and some men can be had for \$3 per day.

The Yearly Earnings,

As may be seen, vary all the way from \$468 for iron-fitters to \$1,716 for ivory-turners—a difference of nearly 400 per cent. The length of time in the year during which steady work is obtained varies considerably in the several kinds of manufacture, the workmen in some being employed all the time, while in others, during a couple of months the full complement of hands is seldom or never worked. Thus, the foundrymen average about nine months, or

only three-fourths of the year; the boiler-makers average about ten months; the mill hands nearly all the time; the boot and shoemakers about ten months, as also do the box-makers, the stair-makers, and many others. The brewers, saw-makers, billiard-table makers, flour-mill hands, trunk-makers, and furniture-makers are employed full time. So also are tailors, compositors for the most part, electricians, and a great many other workmen.

The Occupations of Women and Girls,

In the way of trades and manufactures, number twenty-four. Over one thousand are occupied in the manufacture of white goods; over two hundred in the manufacture of textile fabrics and in boots and shoes. There were over thirty employed in the type-foundry, and a few in the manufacture of gold-leaf and in silver plating. All, or nearly all, the boys' caps are now made by women, as also is a great deal of the ready-made clothing sold in this city; and a few are employed by our hat-finishers. They are also found in photographic establishments, and in book-binders and in many other light employments. The whole number of women and girls employed in this way in the city is about 2,250. Their wages vary from \$5 to \$30 per week, generally averaging about \$10. Boot-closers and those employed in hat-finisher earn sometimes \$30 per week, or as much as men. The couple of dozen hands employed in type-sticking also earn tolerably high wages.

The Boys Employed

Are very few, not numbering quite a thousand. Of these, probably one-half are learning trades; the balance cannot, it is said, be induced to stay long enough in a place to learn anything thoroughly, but once that one thinks he has learned anything, he is off to look for higher wages—and so of course he never learns a trade. Where, then, are we to look for our supply of mechanics, hy-and-by? Must we always import artisans from Europe and the East? The wages of boys in the several branches of business vary from \$3 to \$15 per week.

The System of Co-Operation

Has been in existence in this city for the past few years, first beginning with the boot and shoemakers and the carpenters. Since then, the marble-masons, the foundrymen, the furniture-manufacturers, the printers, and the saddlers have taken it up; but the majority of the co-operative institutions have died. The cause has been disagreement amongst the members and want of business tact. The men would become dissatisfied, and, one by one, withdraw, until the association became dissolved, and its property owned by one or two persons. Such has been the case with all the co-operative boot and shoe factories save one; with the co-operative marble masons; with the Mechanics' Mill and some others.

The Golden Gate, Columbia, and Miners' Foundry were conducted for a year or two on the system of industrial partnership, the employees having a share in the profits; but that has now been abandoned in all save the Miners' Foundry. In each of these foundries, at first the men put in a small sum of money and gave so many days' labor, after which they were entitled to a share in the profits when a fair interest on their employers' capital had been deducted. The proprietors of the Miners' Foundry think well of the system, and we hope that many others will carefully watch the workings of the example just set.

In the following table nearly all the occupations that can properly be claimed as industrial are given, together with the wages at present prevailing in them; leaving out of enumeration those engaged in domestic service, and the sewing-women who work out by the day.

Occupations of Men.

Occupations.	Wages per day while employed.	Average wages per day.	Yearly earnings.
Foundrymen.....	\$3.50@4.00	3.50	750
Moulders.....	3.50@4.00	3.50	750
Machinists.....	3.50@4.00	3.50	750
Pattern-makers.....	3.50@4.00	3.50	750
Blacksmiths.....	3.50@5.00	2.83	882
Blacksmiths' Ass'ts.....	2.00@2.50	1.50	468
BOILER-MAKERS.			
Flange-turners.....	4.00@4.50	3.75	1,144
Fitters.....	4.00@4.50	3.64	1,005
Riveters.....	3.75@4.00	3.22	1,105
Caulkers.....	3.50	2.91	908
Laborers.....	2.25@2.50	1.98	618
MILL HANDS.			
Machine hand.....	4.00@5.00	4.50	1,404
Bench hands.....	4.00	3.75	1,170
Laborers.....	2.00	2.00	624
TRUNK-MAKERS.			
Triers.....	5.00	4.00	1,248
Siders.....	4.50	3.60	1,123
Crimpers.....	4.00	3.20	946
Hand-siders.....	4.00	3.20	946
Bottomers.....	4.00	3.20	946
Fitters.....	2.50@4.00	3.50	811
Finishers.....	3.50@4.00	3.40	946
Packers.....	3.50@4.00	3.00	936
BREWERS.			
Malsters.....	2.50@3.00	2.70	780
Drivers.....	3.00@4.00	3.50	1,080
Laborers.....	1.60@2.50	2.00	600
BOX-MAKERS.			
Cutters.....	3.00	2.25	702
Splitters.....	2.00	1.95	609
Laborers.....	2.25@2.50	1.75	576
STAIR-HANDS.			
Wood-Workers.....	4.00	3.50	1,092
Fitters.....	4.00	3.50	1,092
Millmen.....	4.00	3.50	1,092
Finishers.....	4.00	3.50	1,092
Turners.....	4.50	4.00	1,248
SAW-MAKERS.			
Saw-makers.....	4.00@6.00	5.00	1,500
Saw grinders and polishers.....	3.00@4.00	3.50	1,092
Laborers.....	2.50@3.00	2.75	793
BILLIARD-MAKERS.			
Billiard-makers.....	3.75@4.00	3.80	1,188
Bed-sitters.....	3.00	3.60	1,126
Billiard fitters.....	3.40	3.40	1,064
Adjusters.....	3.00@3.50	3.30	1,033

Occupations.	Wages per day while employed.	Average wages per day.	Yearly earnings.
Varnishers.....	3.50@4.00	3.75	1,170
Carvers.....	4.00@5.00	4.50	1,404
Turners.....	5.00@6.00	5.50	1,714
SADDLERS, ETC.			
Saddlers.....	3.50@4.00	3.75	1,170
Saddle makers.....	4.00	4.00	1,248
Harness makers.....	2.50@3.00	2.75	858
Whip hands.....	4.00	4.00	1,248
FLOURING MILL HANDS.			
Millers.....	5.00	5.00	1,500
Laborers.....	3.00	3.00	936
DISTILLERIES.			
Distillers.....	4.00@5.00	4.50	1,092
Machine men.....	3.00	2.60	624
Laborers.....	2.50@2.75	2.62 1/2	819
WOOLEN MILLS.			
Weavers.....	3.00	2.25	702
Spinners.....	3.00	2.25	702
Laborers.....	2.00@2.25	2.12 1/2	612
TRUNK MAKERS.			
Leather workers.....	4.00@5.00	4.50	1,404
Wood workers.....	3.00@3.50	3.50	1,092
Iron fitters.....	1.50@2.50	1.50	468
Finishers.....	2.00@3.50	2.00	624
FURNITURE.			
Carvers.....	5.00@7.00	6.00	1,872
Cabinet-makers.....	2.50@3.00	4.00	1,248
Machine hands.....	3.00@3.50	3.25	998
TAILORS.			
Cutters.....	3.00@8.00	5.00	1,500
Tailors.....	3.50@5.00	4.00	1,248
ELECTRICIANS.			
Electricians.....	5.00@6.00	5.50	1,716
Brass finishers.....	3.00@4.00	3.50	1,092
GLASS WORKERS.			
Blowers.....	4.00	3.00	936
Helpers.....	2.00@3.50	2.25	702
CARRIAGE BUILDERS.			
Body makers.....	3.50	2.50	780
Wheelwrights.....	3.50	2.50	780
Trimmers.....	4.00	3.00	936
Blacksmiths.....	3.50	2.50	780
Painters.....	3.50	2.50	780
Helpers.....	2.00	1.50	468
COMPOSITORS.			
Compositors.....	8.00@5.00	3.50	1,092
Lithographers.....	3.50	3.50	1,092
Type-founders.....	3.00	3.00	936
Jewellers.....	3.00@5.00	4.00	1,248
Cutlers.....	3.00	3.00	936
Marble-workers.....	2.50@4.00	3.00	936
Bookbinders.....	3.00@4.00	3.50	1,092
Silver-smiths.....	3.00@5.00	4.00	1,248
Silver platers.....	3.00	3.00	936
Spring makers.....	3.50	3.00	936
Coopers.....	3.00@5.00	4.00	1,248
Boat builders.....	4.00	2.00	624
Wire workers.....	4.00	4.00	1,248
Last makers.....	3.50	3.50	1,092
Wire rope makers.....	3.00@5.00	4.00	1,248
Rope makers.....	3.00	3.00	936
Glue makers.....	2.00@2.50	2.25	702
Mathematical Instrument makers.....	2.50@5.00	3.00	1,092
Bakers.....	2.00@3.00	2.50	780
Soap and Candle makers.....	2.50@4.00	3.00	1,092
Woodenware workers.....	8.50@4.00	3.75	1,170
Confectioners.....	2.50@3.75	3.00	1,122
Glass cutters.....	3.00@4.00	3.50	1,092
Silk spinners.....	2.00	2.50	780
Paper Box makers.....	2.50@3.50	3.00	936
Shipwrights.....	5.00	2.50	780
Caulkers.....	5.00	2.50	780
Parasol makers.....	2.50@5.00	3.75	1,170
Tinsmiths.....	4.00@4.00	3.00	936
Bag makers.....	2.00@3.00	2.00	624
Watchmakers.....	4.00@12.50	5.00	1,092
Watchmakers.....	3.00@5.00	5.00	1,500
BUILDING TRADES.			
Stone masons.....	5.00	5.00	1,500
Stone cutters.....	5.00	5.00	1,500
Bricklayers.....	5.00	5.00	1,500
Plasterers.....	5.00	5.00	1,500
Lathers.....	5.00	4.00	1,248
Carpenters.....	3.00@4.00	3.00	936
Painters.....	4.00	4.00	1,248
Plumbers.....	4.00	4.00	1,248
Roofers.....	4.00	4.00	1,248
Hodmen.....	3.00	3.00	936
Laborers.....	2.50	2.50	780

Occupation of Women.

Occupations.	Regular weekly wages.	Average weekly wages.	Yearly earnings.
Boot fitters.....	\$15.00@30.00	\$21.00	\$1,092
Woolen mill.....	5.00@16.00	10.00	520
Carp-bag makers.....	9.00@12.00	11.00	572
Silk thread factory.....	2.50@9.00	5.00	260
Paper box factory.....	6.00@12.00	9.00	468
Shirt makers.....	7.00@10.00	8.50	442
Parasol makers.....	10.00@20.00	12.00	624
Tailoresses.....	10.00@12.00	11.00	572
Cap makers.....	6.00@9.00	7.50	380
Bag makers.....	6.00@9.00	8.00	416
Hat finishers.....	15.00@30.00	12.00	624
Type sorters.....	7.00@12.00	10.00	520
Silver platers.....	8.00@12.00	10.00	520
Gold leaf Manufacturers.....	10.00	10.00	520
Saddlery.....	8.00@10.00	9.00	468
Printers.....	12.00@20.00	18.00	980
Hair work.....	7.00@10.00	8.00	416
Fur making.....	7.00@12.00	10.00	520
White goods.....	8.00@15.00	10.00	520
Kid glove makers.....	5.00@10.00	7.50	380
Seckie makers.....	5.00@10.00	8.00	416
Artificial flowers.....	5.00@10.00	8.00	416
Flag makers.....	7.00@9.00	9.00	468
Photography.....	10.00@15.00	13.00	676

WOLFRAM STEEL.—Some of the most extensive iron establishments in England and Germany are now producing large quantities of what is called Wolfram steel, and it is becoming an important article in commerce and manufactures. The qualities of this steel are very remarkable: When annealed it is so hard that it will stand the best file, but when chilled it becomes soft, though ordinary steel would be hardened. When chilled, it gets covered with cracks, but it may be very well hammered when at a red heat. But any tools met met made at once with the hammer in their required shape, as the file will do nothing more to it. Planing machines, etc., made of this metal are said to outlast those made of the best Sheffield steel.

To BE EXTENDED.—The Virginia and Truckee Railroad is about to be extended from its present terminus, near Mill street, across the hollow forming the head of Six-mile Canyon to near the Ophir works. The road, for a distance of 375 feet, will pass over a wooden trestlework. The road will doubtless soon be extended as far north as Seven-mile Canyon.

MECHANICAL PROGRESS.

Soldering Metals.

For large and heavy pieces of iron and steel, copper or brass is used. The surfaces to be united are first filed off in order that they may be clean. Then they are bound together with steel, and upon the joint a thin strip of sheet copper or brass is laid, or, if necessary, fastened to it with a wire. The part to be soldered is now covered with a paste of clay, free from sand, to the thickness of one inch, the coating being applied to the width of a hand on each side of the piece. It is then laid near a fire, so that the clay may dry slowly. The part to be soldered is then held before the blast, and heated to a white heat, whereby the clay vitrifies. If iron is soldered to iron, the piece must be cooled off in water. In soldering steel to steel, however, the piece is allowed to cool slowly. The semi-vitrified clay is then knocked off, and the surface is cleaned in a proper manner.

By following the hints given, it will be found that a durable and clean soldering is obtained. If brass instead of copper is used, it is not necessary to heat so strongly. The former recommends itself, therefore, for steel. Articles of iron and steel of medium size are best united with hard or soft brass solder. In both cases the seams are cleanly filed and spread over with the solder and borax, when the soldering seam is heated. Hard brass solder is prepared by melting in a crucible eight parts of brass, and adding one part of previously heated zinc. The crucible is then covered and exposed to a glow-heat for a few minutes, then emptied into a pail with cold water, the water being strongly agitated with a broom. Thus the metal is obtained in small grains or granules. Soft brass solder is obtained by melting together six parts of brass, one of zinc, and one of tin. The granulation is carried out as indicated above. Small articles are best soldered with hard silver solder or soft solder. The former is obtained by alloying equal parts of fine silver and soft brass. In fusing, the mass is covered with borax, and, when cold, the metal is beaten out to a thin sheet, of which a sufficiently large and previously annealed piece is placed with borax upon the seams to be united and heated.

Soft silver solder differs from hard silver solder only in that the former contains one-sixteenth of tin, which is added to it during fusion. Very fine articles of iron and steel are soldered with gold—viz., either with pure gold or hard gold solder. The latter can be obtained by fusion of one part gold, two parts silver, and three copper. Fine steel wire can also be soldered with tin, but the work is not very durable. Hard and soft brass solder are used for uniting copper and brass to iron and steel, silver solder for silver, hard gold solder for gold.—*Exchange.*

NEW PROCESS FOR MAKING STEEL DIES.—A new process for making steel dies is spoken of, that work being accomplished by heating the metal to a white heat in a close chamber to exclude the air, and then pressing it upon the material to be copied. It is claimed that by means of this process the hardest steel may be stamped by any soft metal—even lead—so as to make a perfect die of the objects impressed. A carved ring, for instance, might be used to stamp its own image on the hardest and most finely tempered steel, reproducing all its delicate tracing and outline with absolute precision and perfection without injury to the stone.

It is said that the secret of thus being able to bring together friable and easily melted substances, such as lead or precious stones, with semi-fused steel consists in the process of heating the steel disk, which must be of a certain degree of temperature. Admitting the possibility of such a thing, we might remark that it would enable every counterfeiter to get perfectly accurate dies of all kinds of coins, and may be used for the cheap reproduction in steel of any kind of engraving in wood, copper or type metal. The most elegant chiseling, heretofore made at great expense, might thus be cheaply stamped, and the small castings of copper, brass and bronze might be imitated in the hardest steel. Stereotype plates that will defy the wear of years may be made in the same manner.

HARDENING IRON SURFACES.—By means of a simple compound, just invented, the surface of iron may, it is alleged, be hardened in a manner superior to that obtained by any other now in use—the compound, in this case, being mixed with iron in a melted state, and the hardening to take the place of the chilling process. The method in question consists of mixing, in a melted form, three pounds tin, one pound iron, four ounces copper, one half-ounce aluminum, and one-fourth ounce quick silver; and then, from one-eighth to one-quarter of a pound of said compound is mixed with five pounds of cheap iron, in a melted form. The greater proportion of the compound mixed with the iron the deeper from the surface does the hardening process extend. The effect of applying this compound is to make the surface of about that of hardened steel, and it is claimed that it is fully equal to steel in other respects; moreover, the surface will not rust, but will retain its color and brilliancy. The cost, taking into account the difference in the amount of time and labor involved, must be considerably in favor of the new process.

The Gunpowder Pile Driver.

In answer to a correspondent who desires to know the mechanical construction of the recently invented gunpowder pile driver, we give the following description from an exchange: The gunpowder pile driver, brought out originally in this country, was introduced into England some five years since, and its workings has demonstrated that by its use a considerable saving is effected both in time and cost as against the ordinary method of pile-driving. The apparatus consists of an ordinary pile-driving engine having a ram, from the upper and under side of which a plunger projects. The ram is fitted with an arrangement by which it may be retained at any desired height above the pile head. A cast iron cap, having a hole in its centre into which the lower plunger of the ram will fit, is placed on the top of the pile to be driven, and in the hole is inserted a small charge of gun powder. On the ram being released the lower plunger enters the hole in the cap and, compressing the air within, generates heat, which ignites the gun powder. The force of the explosion is utilized partly in driving the pile downward, and partly in throwing the ram upward, the latter being detained at the required height ready for the next blow. Should the ram be thrown too high, the upper plunger enters an air cylinder, compressing the air and cushioning the blow. The charges of gunpowder were at first fed into the cap piece by hand, but a self-acting feeding arrangement is now used which supplies ammunition automatically after every shot.

Railroad Consumption of Timber.

But few people are aware of the immense drain which the railroads make upon the timber resources of the country, and what a boon it would be to the Railroad Companies and the desired permanence of our forests if some practical device could be introduced as a substitute for wooden ties. It is estimated that the number of railroad ties in present use in the United States are 150,000,000. And as young timber is mostly used, a cut of 200 ties to the acre is above rather than under the average, and it therefore has required the product of 750,000 acres of well timbered land to furnish the supply. Railroad ties last about five years, consequently 30,000,000 ties are used annually for repairs, taking the timber from 150,000 acres. The manufacture of rolling stock requires the entire yield of 350,000 acres, more every year. Thus it appears, that our railroads are stripping the country at the rate of 500,000 acres per annum, and their demands are rapidly increasing.

LARGE CALORIC ENGINES.—The reason that large caloric engines are not more used, is that they do not produce power enough. They are only available for such labor as requires little power, like grinding, running printing-presses, small turning lathes, etc.; but when applied to a planing-machine, circular-saw, paddle-wheel, or screw-propeller of a ship, etc., they are comparatively powerless. This was the cause that in the steam ship *Ericson*, the caloric engine was taken out and a steam engine substituted. This ship, which was built at a cost of nearly \$1,000,000 by a young enterprising merchant of New York, under the immediate supervision of Capt. *Ericson*, the inventor himself, in order to give his invention a fair test on a large scale, was such a decided failure, that not only could it not be propelled with any reasonable velocity, but the engine had not power enough to make it possible to steer the ship, so that when at one of its trials in New York harbor a stiff breeze made it keel over, the engine was too weak to steer it in the wind. The result was that the water ran in the ports, and she sank in 40 feet of water. After taking her out, the caloric engine was abolished, having fully proved to be a colossal failure.

INGENIOUS ENGINEERING.—During the construction of the bridge at Kullenborg, Holland, says the *Chronique de l'Industrie*, one of the principal traverses, some 465 feet in length, was placed about one inch too far on the piles. This error was rectified in a very ingenious manner. The expansion of the mass of metal was exactly .0394 inches per Fahrenheit degree. At the locality of the work the difference between the temperature of the atmosphere by day and by night was 25° Fah. In the morning the too far advanced end of the traverse was securely bolted down, when during the day the heat of the sun expanded the metal so that the free extremity advanced .395 of an inch. Then at night the latter end was fastened and the contraction caused a like movement of the opposite free extremity. This operation twice repeated, brought the traverse into its proper position.

ENAMELED FACED BRICKS.—We have already alluded to a new style of brick, by which that useful building material was to assume a more decorative character than heretofore, and it is now stated that extensive works are being erected in Pittsburg to manufacture pressed bricks with enamelled facings. The enamel is made of various colors to suit the tastes of architects or builders, and as it is impervious to water or acids, having a surface that can be cleaned like glass, it is well adapted for building purposes in the smoky cities of the West. The enamel is claimed to increase the strength and durability of the bricks, while giving all the beauty of the surface to be obtained from stone or marble. The cost is said to be \$20 per thousand over common pressed brick.

SCIENTIFIC PROGRESS.

Frictional Electricity.

Some recent experiments, on frictional electricity, made by Edward Hagenbach, seems to contradict the principle so generally taught, that when glass is rubbed with cat's fur, negative electricity is produced. The principal has been so generally believed, that the name of vitreous electricity has been proposed, and in some text-books adopted, instead of, and as synonymous with, negative electricity.

Hagenbach observed, on rubbing a glass tube with the fur from the neck, or hind leg of a wild cat, that if the rubbing was continually in one direction, the glass became negative; but if rubbed first one way, and then the other, it became positive; when he used fur from the back of the animal, glass rubbed in one way only, also became positive. The pressure exerted during the rubbing also made a difference, a light pressure producing negative, and heavy pressure positive. It also makes a difference whether the glass is rubbed with the fur, or the fur is rubbed with the glass. In these experiments, Hagenbach says he used smooth glass, for mat glass, or glass that had been passed through the flame of an alcohol lamp, always became negative when rubbed with fur.

If the glass was rubbed with a fox's tail, it always became positive.

Porcelain exhibits a phenomenon similar to glass; a smooth porcelain tube rubbed with wool or silk, becomes positive, a rough one negative.

The phenomenon observed on rubbing a rough porcelain tube with vulcanized india-rubber, is quite peculiar. At first it becomes positive, but with longer and bolder rubbing, it becomes negative, and so it remains, whether rubbed much or little. By drawing through a flame, or cleaning with chemical agents, it loses the property of becoming negative, which property is restored by rubbing with flowers of sulphur.

Different kinds of paper vary greatly, according to material, and method of manufacture. The hand-made paper of the sixteenth century, as, also, Chinese and so-called silk paper, becomes negative, if drawn violently through the fingers; by rubbing gently with the fingers, it becomes positive. Sometimes machine paper also exhibits two actions towards electricity. Paribent paper, formed by the action of sulphuric acid, is more inclined to positive electricity than most other kinds of paper. Pyroxiline paper becomes negative whether rubbed with the hand, with silk, or with india rubber, but positive when rubbed with gun-cotton. Pogendorff proposed to use pyroxiline paper, rubbed between the fingers, as an electroscope for detecting negative electricity. An electroscope for positive, may be made of a dry strip of ordinary paper rubbed with vulcanized rubber, or better still, with gun-cotton.

The above are but a few of the many curious and unexpected results which Hagenbach has obtained, and who knows but they may lead to an easy and practical method of deciding between substances which very closely resemble each other in other respects? The action of different kinds of fur on the same piece of glass, may yet enable the inexperienced to ascertain on what animal it grew; or, perhaps, it may prove a guide as to the quality or composition of the paper we are buying.—*Am. Artisan.*

DEEP SEA CURRENTS.—The principles involved in the circulation of the waters of the sea were beautifully shown before a late meeting of the British Royal Geographical Society, by a simple experiment. A trough with plate-glass sides, about six feet long, and a foot deep but not more than an inch wide, was filled with water. At one end a piece of ice was wedged in between the sides to represent the polar cold; while the tropic heat was represented at the other end by a bar of metal laid across the surface of the water, the projecting end of which was heated with a spirit lamp. Red coloring matter was then put in at the warm end and blue at the cold end, so that the currents could be traced. The blue water, chilled by contact with the ice, immediately fell down to the bottom, crept slowly along, and gradually rose towards the surface at the equatorial end, after which it gradually returned along the surface to its starting point. The red water crept first along the surface to the polar end, then fell to the bottom just as the blue had done, and formed another stratum, creeping back again along the bottom, and coming again to the surface. Each color made a distinct circulation during the half hour in which the audience viewed the experiment.

GUM IN PLANTS.—From experiments made with pyrogallie acid, Struvé concludes that gums perform a function in plants analogous to that of the blood in animals. Pyrogallie acid in contact with alkalies oxidises rapidly, becoming of a dark brown color; with other substances, such as gum arabic and blood, the oxidation is slow, a yellow color is produced, and long needle-like crystals form, which are insoluble in water. The least trace of this yellow substance produces an intense blue with ammonia or other caustic alkalies. The exact composition of this curious substance has not yet been ascertained.

The Composition of Rust.

Prof. Grace Calvert, a distinguished English chemist, has been investigating the circumstances under which rust is formed. He found that iron rust is a much more complicated substance than is generally supposed. Two specimens—one from Conway Bridge, and the other from Llaugocollen, Wales—had the following composition:

	Conway Bridge	Llaugocollen.
Sesquioxide of iron.....	62,900	93,094
Protoxide of iron.....	6,177	6,810
Carbonate of iron.....	0,617	0,605
Carbonate of lime.....	0,235	0, 98
Silica.....	0,121	0,196
Ammonia.....	trace	trace
Total.....	100,000	100,000

This proves that the decomposition of water has less to do with the formation of rust than has heretofore been supposed, and that carbonic acid is the most powerful agent. This was also proved by direct experiment. Clean iron blades were exposed in glass tubes to the action of various gases, wet and dry. Under these circumstances, pure and dry oxygen does not determine the oxidation of iron; moist oxygen has only a feeble action; dry or moist pure carbonic acid has no action, while oxygen containing traces of carbonic acid acts most rapidly on iron, giving rise to protoxide of iron, then to carbonate of the same oxide, and lastly to a mixture of saline oxide and hydrate of sesquioxide. Carbonic acid and water acted with energy, an abundant and perfectly white deposit was formed on the surface of the water, accompanied with decomposition of fluid.

Minute quantities of foreign substances affect the liability of iron to rust, some increasing it and others lessening it. Thus impure iron may have a greater or less tendency than the pure metal to oxidation, and this fact is exceedingly important, for it points the way to investigations which may lead to a new classification of irons. Cold short and red short, hard and soft, are qualities which affect the commercial uses of iron, and if to these can be added rusting and non-rusting iron, there will be immediate use for the latter among bridge and foundation builders, and many other consumers.

Solutions of alkalies, either caustic, carbonate or bi-carbonate, prevent the rusting of iron; and Prof. Calvert suggests that caustic alkalies can be thrown into the holds of iron ships that suffer from the action of bilge water on the plates. Sugar greatly increases the tendency to oxidation, a fact that explains the rapid destruction of iron ships engaged in carrying sugar. Prof. Calvert renews the recommendation he made some years ago, that a small piece of zinc should be fixed to each plate of iron. This renders the metal "passive" and prevents oxidation. Under ordinary circumstances, the zinc will protect the iron when it covers only 1-100th part of the latter's surface; but, with sugar water the proportion must be 1 zinc to 15 iron surface.

CHEMICAL ACTION OF THE SOLAR RAYS.—Mr. Marchand, says *Les Mondes*, has just completed a long and careful study of the chemical action of solar rays. He exposed to light a mixture of definite proportions of oxalic acid, perchloride of iron and water. Under the influence of the rays, the perchloride was decomposed and became protochloride; the chlorine, set at liberty, combined with the hydrogen of water, to form hydrochloric acid; and the oxygen of the water, uniting with the oxalic acid, transformed it into carbonic acid, which was disengaged. The quantity of carbonic acid thus given off is proportional to the intensity of the light, and serves as its measure. The difficulty was, however, to determine accurately the amount of carbonic acid without having recourse to mercurial apparatus, very expensive and hard to manage. M. Marchand has found, however, and *Les Mondes* terms it a great discovery in practical chemistry, that, for the determination of the carbonic acid, glycerine may be well substituted for mercury. He has also observed that his mixture, considered as a reagent of chemical rays, differs from the nitrate of silver in the particular that the maximum of its intensity is at the middle of the blue, while that of the nitrate is at or near the violet.

VOLATILIZATION OF IRON AND GOLD.—It seems that iron is volatile at very high temperature, the same as gold and platinum. Dr. Elsner, Director of the Berlin porcelain factory, enclosed a small piece of wrought iron in an unglazed crucible and exposed it for several hours to a temperature of at least 3,000° C. On removing the cover of the crucible, small needles of metallic iron were easily discerned, clearly showing that iron can be volatilized at high temperatures.

CARBON AS AN ANTIDOTE TO PHOSPHORUS.—The property of charcoal or bone black to remove metals from their solutions is well known, and the recent discovery of MM. Eulenberg and Wohl that phosphorus may also be thus eliminated has been applied with success in cases of poisoning by that element. In the match factories of France, charcoal pills have been used for more than a year past, with most encouraging results.

POTASSIC CHLORATE.—It has been lately discovered that tin-foil, wrapped round a few crystals of potassic chlorate, can be made to detonate loudly by striking it smartly with a hammer on an anvil or in a mortar.

Highest and Lowest Regular Sales—No. Shares Sold—Advance and Decline—for Last 6 Days in S. F. Stock & Ex. Board.

NAMES OF COMPANIES.	Shares in ft.	FRIDAY.		SATURDAY.		MONDAY.		TUESDAY.		WEDNESDAY.		THURSDAY.		Advance or Decline.	Dollars.
		Shs.	Prices.	Shs.	Prices.	Shs.	Prices.	Shs.	Prices.	Shs.	Prices.	Shs.	Prices.		
Adams Hill.	300	130	50 1/2	130	50 1/2	130	50 1/2	130	50 1/2	130	50 1/2	130	50 1/2		
Alamo.	300	114	45	114	45	114	45	114	45	114	45	114	45		
Alph.	800	374	60 1/2	374	60 1/2	374	60 1/2	374	60 1/2	374	60 1/2	374	60 1/2		
Alps.	200	114	45	114	45	114	45	114	45	114	45	114	45		
American Flat.	200	114	45	114	45	114	45	114	45	114	45	114	45		
Amador Tunnel.	300	114	45	114	45	114	45	114	45	114	45	114	45		
Armadillo.	300	114	45	114	45	114	45	114	45	114	45	114	45		
Arizona & Utah.	100	194	60	194	60	194	60	194	60	194	60	194	60		
Belcher.	100	100	60	100	60	100	60	100	60	100	60	100	60		
Baltimore Con.	100	100	60	100	60	100	60	100	60	100	60	100	60		
Bowery.	100	100	60	100	60	100	60	100	60	100	60	100	60		
Buckeye.	100	100	60	100	60	100	60	100	60	100	60	100	60		
Best & Belcher.	100	100	60	100	60	100	60	100	60	100	60	100	60		
Bellevue.	100	100	60	100	60	100	60	100	60	100	60	100	60		
Belmont.	100	100	60	100	60	100	60	100	60	100	60	100	60		
Chollar.	100	100	60	100	60	100	60	100	60	100	60	100	60		
Caledonia.	100	100	60	100	60	100	60	100	60	100	60	100	60		
Cona Virginia.	100	100	60	100	60	100	60	100	60	100	60	100	60		
Confidence.	100	100	60	100	60	100	60	100	60	100	60	100	60		
Crown Point.	100	100	60	100	60	100	60	100	60	100	60	100	60		
Central.	100	100	60	100	60	100	60	100	60	100	60	100	60		
Columbia.	100	100	60	100	60	100	60	100	60	100	60	100	60		
Columbus.	100	100	60	100	60	100	60	100	60	100	60	100	60		
Chollar & Belmont.	100	100	60	100	60	100	60	100	60	100	60	100	60		
Danby.	100	100	60	100	60	100	60	100	60	100	60	100	60		
Eureka Cons.	100	100	60	100	60	100	60	100	60	100	60	100	60		
Exchequer.	100	100	60	100	60	100	60	100	60	100	60	100	60		
Exch.	100	100	60	100	60	100	60	100	60	100	60	100	60		
Empire.	100	100	60	100	60	100	60	100	60	100	60	100	60		
Empire & Belmont.	100	100	60	100	60	100	60	100	60	100	60	100	60		
Gold & Curry.	100	100	60	100	60	100	60	100	60	100	60	100	60		
Golden Chariot.	100	100	60	100	60	100	60	100	60	100	60	100	60		
Globe.	100	100	60	100	60	100	60	100	60	100	60	100	60		
Hale & Norcross.	100	100	60	100	60	100	60	100	60	100	60	100	60		
Hunt & Belmont.	100	100	60	100	60	100	60	100	60	100	60	100	60		
Hermes.	100	100	60	100	60	100	60	100	60	100	60	100	60		
Ida Belmont.	100	100	60	100	60	100	60	100	60	100	60	100	60		
Imperial.	100	100	60	100	60	100	60	100	60	100	60	100	60		
Ingomar.	100	100	60	100	60	100	60	100	60	100	60	100	60		
Independent.	100	100	60	100	60	100	60	100	60	100	60	100	60		
Ivanhoe.	100	100	60	100	60	100	60	100	60	100	60	100	60		
Jackson.	100	100	60	100	60	100	60	100	60	100	60	100	60		
Julia.	100	100	60	100	60	100	60	100	60	100	60	100	60		
Justice.	100	100	60	100	60	100	60	100	60	100	60	100	60		
Kentuck.	100	100	60	100	60	100	60	100	60	100	60	100	60		
Knickerbocker.	100	100	60	100	60	100	60	100	60	100	60	100	60		
Knickerbocker.	100	100	60	100	60	100	60	100	60	100	60	100	60		
Mammoth.	100	100	60	100	60	100	60	100	60	100	60	100	60		
Meadow Valley.	100	100	60	100	60	100	60	100	60	100	60	100	60		
Mahogany.	100	100	60	100	60	100	60	100	60	100	60	100	60		
Monitor Belmont.	100	100	60	100	60	100	60	100	60	100	60	100	60		
Newark.	100	100	60	100	60	100	60	100	60	100	60	100	60		
Ophir.	100	100	60	100	60	100	60	100	60	100	60	100	60		
O. H. Presque.	100	100	60	100	60	100	60	100	60	100	60	100	60		
Overman.	100	100	60	100	60	100	60	100	60	100	60	100	60		
Occidental.	100	100	60	100	60	100	60	100	60	100	60	100	60		
Pioche.	100	100	60	100	60	100	60	100	60	100	60	100	60		
Pioche Phoenix.	100	100	60	100	60	100	60	100	60	100	60	100	60		
Page & Panama.	100	100	60	100	60	100	60	100	60	100	60	100	60		
Pea Vine.	100	100	60	100	60	100	60	100	60	100	60	100	60		
Phoenix.	100	100	60	100	60	100	60	100	60	100	60	100	60		
Raymond & Ely.	100	100	60	100	60	100	60	100	60	100	60	100	60		
Sage.	100	100	60	100	60	100	60	100	60	100	60	100	60		
Seg. Belcher.	100	100	60	100	60	100	60	100	60	100	60	100	60		
Sierra Nevada.	100	100	60	100	60	100	60	100	60	100	60	100	60		
Senator.	100	100	60	100	60	100	60	100	60	100	60	100	60		
Snocor.	100	100	60	100	60	100	60	100	60	100	60	100	60		
Salver Hill.	100	100	60	100	60	100	60	100	60	100	60	100	60		
Silver Peak.	100	100	60	100	60	100	60	100	60	100	60	100	60		
South Chariot.	100	100	60	100	60	100	60	100	60	100	60	100	60		
Wash. & Creole.	100	100	60	100	60	100	60	100	60	100	60	100	60		
Woodville.	100	100	60	100	60	100	60	100	60	100	60	100	60		
War Eagle.	100	100	60	100	60	100	60	100	60	100	60	100	60		
Yellow Jacket.	100	100	60	100	60	100	60	100	60	100	60	100	60		
Yule Gravel.	100	100	60	100	60	100	60	100	60	100	60	100	60		

Our Weekly Stock Review.

THURSDAY EVE, May 15, 1873.

The Stock Market this week has been in nearly as excited a state as it was last week, and prices generally have kept up remarkably well. The transactions in Ely stocks have not been so free as in Washoe. The former being comparatively depressed. The southern end of the Comstock has come into favor this week. The raise in Baltimore Consolidated on account of the ore strike in the lower level in the mine carried its neighbors with it. Caledonia, Knickerbocker, Overman and Danby all felt its influence. It has become known that work on the lower level of the Baltimore Consolidated has been suspended on account of an order from this city. It is stated that the second discovery of ore which caused the raise from \$14 on Saturday to \$22 on Tuesday, came 30 days before it was expected, deranging a good many plans. Beside the report of the strike in Baltimore Consolidated, there are reports of a rich strike of a body of ore in the 8th level of Meadow Valley No. 3.

The large amounts of money paid out by the Crown Point and Belcher mines, the comparative ease in the money market, and the generally favorable reports from prominent mining districts, all tend to advance the prices of stocks and inspire confidence in values. The hullion from the Washoe mines and other sources is crowding the Gold and Silver Refinery to its utmost capacity, and the Mint has its hands full. It makes money more plenty, however, to have this large amount monthly added to our coin supply. The select at the Board last week exceeded those of the previous one some \$900,000. They amounted to \$3,933,650—the largest sum in many months. The most active stocks were, Baltimore, Consolidated, American Flat, Imperial and Westington & Creole.

The Cherokee Flat Blue Gravel Company propose on the 12th of June to increase their capital stock from \$65,000 in 650 shares, to \$3,120,000, in 31,200 shares. An interesting letter in relation to the Washoe mines will be found in our editorial columns.

On Friday the activity of the market still continued, with an unusually long session of the Board. A considerable advance was manifest at the Afternoon Board; Belcher rose \$7; Crown Point, \$14; Imperial, \$2; Overman, \$3; Seg. Belcher, \$10; Caledonia, \$5; Baltimore Con., \$1; Meadow Valley, \$8.

Saturday prices were firm and the market still active and excited. Belcher closed \$1.50, (dividend off) Crown Point, \$3; Alps, \$5; Baltimore Con., \$4; Con. Virginia, \$3; Empire Mill, 6 1/2 cents; Gould & Curry, \$1; Julie, \$5; Overman, \$2; Savage, \$1.

Monday the market opened strong, with an advance in prices. Belcher closed \$1.50; Baltimore Con., \$7; Knickerbocker, \$2; Caledonia, \$5; Nevada 25 cents; Justice, \$5; Chollar, \$2; Ophir, \$1; Overman, \$3; Jacket, \$4; Raymond & Ely, \$7; Meadow Valley, \$1.

On Friday the market continued its activity, the Board meeting half an hour earlier than usual to accommodate increase in business. Savage rose in the afternoon \$4 and other descriptions, from \$1 to \$4.

Wednesday showed some activity in stocks, particularly for Washoe mines. Savage going up \$30; some descriptions however, showed a decline.

To-day prices declined materially, most descriptions selling lower than yesterday. This collapse is caused by the desire of holders to realize on the advance of the past few weeks. The fluctuations will be seen by referring to our Stock Tables.

The following items of interest from prominent mines are collated from letters or telegrams from superintendents on file at the office of the respective companies in this city.

Amador Tunnel.

Dispatch of the 8th says the mine is improving very much. Shaft is progressing favorably.

Letter of the 9th says they are timbering the sixth level station. Will commence sinking for seventh level soon. Stopping ore from the sixth level will soon be commenced, developments of high grade ore have been made. Stopping ore over the fifth level, east of main shaft, as usual with an improvement in the quality of the ore body. Fifth level raise, west of main shaft, shows ore twelve inches thick. Fourth level winze, west of main shaft, shows a body fourteen inches thick. New stop, west of main shaft in the fifth level shows ore body sixteen inches in the face. Are stopping in Nos. 1, 2 and 4 levels west. Shipped 30 tons ore to mill to-day. Mill running on flag ore.

Arizona & Utah.

Letter of the 12th says the work is progressing favorably at the mine. The drift continues to advance steadily. Rock is very hard again. Doing nothing in the bottom of the Shaft. Water decreasing some. Everything looks well.

Belcher.

Dispatch of the 14th says that in the connection on the 1200-foot level the Surveyor made a mistake of four feet in the grade. It will take a week to grade over running and ore. Ore breaks everywhere looking well. Car samples, \$104 per ton.

Buckeye.

Letter of the 10th gives the following summary of operations for that week: ore extracted and forwarded to the mills 151 tons 300 pounds, average assay value of ore extracted as determined by car samples \$17.36 per ton. Ore worked during the week 153 tons. Gross yield in bullion \$1,638.80 average per ton \$11.03. During the week no change of importance has occurred at the mine.

Crown Point.

The bullion shipment on the 8th was \$72,335.03, making the total amount received on the April account, so far, \$1,122,814.37.

Dispatch of the 14th says the whole face of the crosscut from the third floor is giving a fair quality of ore. The crosscut from the fifth floor of the 1300-foot level is in porphyry. We are putting in last station a set of timbers at the 1500-foot level, and have one set in the incline below the 1500-foot level. The mine looks well at other points.

Dispatch of the 12th says the face of the crosscut from the fifth floor of the 1300-foot level is in ore of fine quality, except two feet in the top, which is hard porphyry. The crosscut from the third floor is badly mixed with porphyry, with some rich streaks running through it. The mine generally looks well.

Dispatch of the 13th says the crosscut from the fifth floor of the 1300-foot level is in porphyry, which is probably the east wall. The crosscut from the third floor of the 1300-foot level, 40 feet from the Belcher, is mostly waste. No change since last report in other parts of the mine.

Assessments, Meetings, Dividends.

(COMPILED DAILY FOR THE MINING PRESS.)

NOTE.—In the Stock Boards an assessment is delinquent thirty days from the date of levy, exclusive of that date. The dates given in this list are those of the mining office.

ASSESSMENTS.—Stocks on the Lists of the Boards.

Company.	Location.	No.	Amt.	Levied.	Delinq't.	Sale.	Secretary.	Place of Business.
Alphina G M & M Co.	Amador Co, Cal	4	1 000	May 13	June 17	July 8	Joel F. Lightner,	438 California st.
Bellevue M. Co.	Placer Co., Cal	6	50	April 14	May 19	June 9	T. F. Cronise.	438 California st.
Baltimore Con. M. Co.	Nevada.	2	75	Mar. 31	May 6	May 23	D. T. Bagley.	401 California st.
Bowery Con. M. Co.	Ely District.	3	50	May 5	June 16	July 1	C. E. Elliott.	419 California st.
Columbus M. & M. Co.	Nev.	50	50	May 25	May 29	June 9	B. B. Minor.	414 California st.
Con. Virginia M. Co.	Nev. 14	3	300	Apr. 3	May 14	June 6	D. T. Hagley.	401 California st.
Dutch Flat Blue Gravel M Co.	Nev.	1	50	May 13	June 14	July 1	W. M. Holman.	401 California st.
Empire M. Co.	Washoe, 12	3	1 000	Apr. 10	May 17	June 6	F. F. Baloom.	420 Montgomery St.
Empire M. & M. Co.	Washoe, 12	50	50	May 14	May 19	June 9	G. R. Spinney.	320 California st.
Golden Charlott Mining Co.	Iaho.	8	2 500	Mar. 20	Apr. 28	May 17	L. K. ap.	Merchants Bldg.
Gould & Hunt	Ely District.	17	40	May 14	June 16	July 1	H. K. Spang.	419 California st.
Hubb & Curry S. M. Co.	Ely District.	6	1 500	May 12	June 18	July 16	T. W. Colburn.	414 California st.
Iida Elmore M. Co.	Iaho.	9	2 500	Mar. 25	Apr. 28	May 20	Wm. Willis.	415 California st.
Imperial S. M. Co.	Iaho.	1	1 000	Apr. 1	Apr. 28	May 14	W. M. Willis.	415 California st.
Independence Gold Mining Co.	Cal.	3	40	Apr. 22	May 7	May 28	G. T. Grimes.	240 Montgomery st.
Insurance M. Co.	Washoe.	1	25	May 5	June 5	June 27	F. E. Launders.	507 Montgomery st.
Jackson M. Co.	Nevada.	5	10	Mar. 24	Apr. 22	May 16	R. C. Kibbe.	415 California st.
Kaiser, Yashoe	Nevada.	4	100	Mar. 24	Apr. 22	May 16	R. C. Kibbe.	415 California st.
Kaiser-Hocker M. Co.	Nevada.	5	1 000	Mar. 24	Apr. 22	May 16	H. Boyle.	Stevenson's Building
Mansfield G M Co.	El Dorado, Cal	2	5	May 8	June 9	July 1	Wm Small.	281 Kearny St.
Mahogany G. and S. M. Co.	Iaho.	2	2 500	Mar. 31	Apr. 28	May 16	E. McAddin.	1 Exchange Bldg.
Marysville & S. M. Co.	Storey Co., Nev.	10	10	Mar. 21	June 10	June 30	D. Jennings.	401 California st.
Minneapolis.	Iaho.	5	100	Mar. 21	Apr. 26	May 15	Wm. Willis.	415 California st.
Mint G. M. Co.	Washoe.	10	10	May 6	June 10	June 30	D. A. Jennings.	401 California st.
Newark S. M. Co.	Ely District.	4	50	Apr. 10	May 20	June 10	D. T. Bagley.	401 California st.
Phoenix S. M. Co.	Nevada.	25	50	Mar. 27	Apr. 27	May 20	J. M. H. Bagley.	Merchants Bldg.
Phenix Silver Mining Co.	Enreka Dis.	10	25	Apr. 16	May 21	June 11	Joseph Maguire.	419 California st.
Puiche Phenix M. Co.	Ely District.	3	1 000	May 6	June 19	July 11	C. E. Elliott.	419 California st.
Portland S. M. Co.	Ely District.	9	100	May 9	June 9	July 1	W. M. Willis.	415 California st.
Revere Mining	Nevada.	9	10 00	Apr. 5	May 5	May 27	E. B. Holmes.	1 Fireman's Fund
Silver Peak M. Co.	Nevada.	2	75	Apr. 3	May 8	May 28	H. C. Kibbe.	419 California st.
Silver West Con. M. Co.	Eureka, Nev.	10	75	Apr. 3	May 15	June 10	F. R. Buckner.	Montgomery Block
Uah S. M. Co.	Washoe.	8	50	Apr. 25	May 25	June 10	D. T. Bagley.	415 California st.
Union M. Co.	Creale M. Co. Flv.	8	50	Apr. 25	May 23	June 27	F. R. Olsary.	Merchants Bldg.

Ophir.

Letter of the 10th says the 1200 and 1300-foot levels are progressing well in fair ground; the ledge could be reached by both of the crosscuts in about two weeks.

Letter of the 12th says there is no change to report except an improvement in character of material being cut from the north mine first station. All work going on well.

Overman.

Letter of the 10th says the new to report. Rocking the west drift is somewhat softer, having made 38 feet in that drift during the past week. Rock in the north drift is very hard; made 18 feet during the week; face of drift is in granite. South drift is in granite and porphyry, with occasional streaks of quartz; made 38 feet this week. Water in shaft gradually decreases. Machinery works well. Everything above and below the ground is working well.

Page & Panaca.

Letter of the 4th says the main drift is now in 700 feet from shaft. Are now getting into good quartzite again, similar to that in the Raymond & Ely mine, which gives great encouragement. We have a small ledge or seam of ore 600 feet from the shaft, which has yielded ore assaying \$12 per ton.

Raymond & Ely.

Dispatch from the Superintendent under date of the 9th says: "I shipped yesterday, \$21,012." Provisions shipment this month, \$33,051, making the total for the month, so far, \$54,063.

Dispatch from the Superintendent under date of the 13th says: "I shipped yesterday, \$24,614." This makes the total for the month, so far, \$78,677.

Dispatch from the Assistant Superintendent under date of the 14th says no change in eighth level. Seventh level (Meadow Valley extension ground) the winze is thirty feet deep. Getting out five feet of ore, leaving it in the hanging wall. No change in the eight drift from the seventh level in Meadow Valley extension ground. Sixth level winze is through to seventh level. No change in stopes.

Senator.

Letter of the 10th says we have since the 3d, retimbered shaft 24 feet, have added to depth 20 feet, making a total depth of 335 feet. Bottom of shaft shows some quantities of quartz bearing metal; ground is very favorable.

Silver Hill.

Letter of the 7th says last night while drifting north from the first crosscut we run into a lot of ore, showing better than any yet found, and still looks as well this evening. The second crosscut shows signs of a near approach of ore. Second station drift continues very hard. Mill is running and looking very well. Shipped on 7th to Bacon mill 694 tons of ore; assay same day, \$37.37.

Letter of the 8th says there is no change in the mine, except in the second station, which is working better and making more headway. Shipped to the Bacon mill on the 8th, 34 tons and 900 pounds of ore. Assay same day gave \$70.64.

Letter of the 10th says no change in mine of note, the second station continues working very satisfactorily. The mill is running well and is in good order. Shipped to Bacon mill on the 9th, 85 tons and 1,300 pounds, assay same day, \$55.88.

Woodville.

Letter of the 11th says they will make another partial clean-up of both mills on Tuesday next. The prospects of the mine are very flattering. Stopes on lower level are looking and yielding well. The first station north is improving.

Wellington.

Letter of the 9th says the mill is looking well and shipping ore at \$11.50 and \$12 per ton. The Emma engine house was burned yesterday.

MINING SUMMARY.

This summary is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

California.

BUTTE.

THE NEW PLACER DROGGINGS.—Butte Record, May 10: The interest below town continues unabated. The Greely company have nine claims on their claims, and are putting in pumps to drain them. The Glohe company are also progressing with their claims, and all will soon be able to make a profitable showing. The Children are still active in buying everything in sight that has a title that will enable them to hold their purchase. Several claims have been sold at a very fair figure during the week. The most extensive sale noted is that of Dr. Jenkins, who has disposed of his fine ranch and 40 acres, vineyard, with a fine brick residence, and all necessary buildings for the manufacture and storing of wines, to Chinese miners for the sum of \$4,000. This is one of the oldest and finest vineyards in the county, requiring irrigation, and producing an extensive and valuable crop of grapes. Whether our celestial miners mine up the vineyard, depends, we suppose entirely upon the fact whether they can find "one dollar hemp" per day he needs it. They readily find all the ground to which they can find title, and have plenty of money for that purpose. An American mining population could prosper here, but this class do not appear to care for diggings that cannot be worked with sluice and hydraulic, and dispose of their claims for a few hundred dollars in coin. The Chinese population is rapidly increasing, and are overrunning the valley and giving it the appearance of an ant's nest.

BROWN FINE CHEROKEE.—A gold brick, heavier than a man could handle with one hand, and valued at \$25,000, came down from Cherokee the other day, to swell the circulating medium of the Pacific Coast. Operations on the Cherokee ditch from Butte Creek continue to be vigorously prosecuted, and Cherokee will soon have constant supply of water for mining purposes. The necessary pipe is under way for conveying the water from Dogtown ridge to the Cherokee hills, and will soon be received, either at Rohle's station, on the Butte Creek, or at Groville.

CALAVERAS.

RAILROAD FLAT DISTRICT.—Oslaveras Chronicle, May 10: 100 tons of ore from the Sanderson, crushed at Clark's mill, yielded at the rate of \$25 per ton. The 100-ft. level is being extended north of the shaft, showing richer ore than the south chimney. Sinking will be resumed immediately. Gamble & Co. have taken out 80 tons of ore, which is being hauled to Clark's mill. The Prussian Hill mine is to be started again.

MOQUITO DISTRICT.—Brown & Co. crushed 20 tons of ore, which paid over \$30 per ton. The substantial mine shaft of the Good Hope, 10 by 4 in the clear, is going down rapidly to the tunnel, 130 ft. below surface. A tunnel has been started on the Woodcock, to run on the vein; the tunnel will be 200 ft. below the surface of the deepest shaft, some 450 ft. distant from the mouth of the tunnel. Work in the levels of the Dolly Varden has been stopped with the intention of sinking the main shaft 100-ft. deeper (200 ft. in all) previous to attaching a mill to the mine. The dumps are well filled. The ore prospects from \$10 to \$200 per ton.

WATER FORT DISTRICT.—Ohio Con. running levels on west vein. Cross drift to east vein in 30 ft. Zaca-tone let contract to sink the main shaft 50 ft. deeper at \$15 per ft. Gre from the Lone Star being crushed at Carlton's mill will probably yield \$50 per ton. The

Harris is still yielding fair quantities of pay-ore above water. No attempt has as yet been made to test this mine below water, although the vein is large at water level. A small but rich vein is being worked by Gouldson & Co., west of the village.

BLUE MOUNTAIN.—The damage inflicted upon the Hockendorn Company's mill at Blue Mountain, by the heavy snowfall of last winter, is completely repaired. The new building is substantial enough to prevent the recurrence of any similar accident in the future. The mill is now in first-rate order, running day and night, crushing very rich rock from the mine.

IMPERATRICE Eugenie proves also to be rich. The vein is gradually increasing in width, its dimensions at present being 12 ft. The Co. has already cleared and leveled the site for a mill, which will be built as soon as episodic will permit tenders to haul up material.

HAPPY VALLEY FLEMING CLAIM.—We are pleased to learn that this old claim, which years ago was one of the best paying gravel mines in the county, has again become largely remunerative. In fact, we have it from good authority that the proprietor, Mr. Patrick Drumm, is absolutely taking out gold by the pound!

KLAMATH.

BLACK BEAR.—Grass Valley Union May 8: A telegram from Yreka, dated May 6th, says: "The Black Bear Co. at Sawyer's Bar, Klamath county, are now taking out immense quantities of rich quartz, and their ledge which have now uncovered is 35 ft. in width. Several new ledges have been discovered in the Salmon river district."

PLACER.

OUR MINES.—Placer Argus, May 10: The Eclipse Mill, Ophir, under the superintendency of J. B. Patterson, has been for the past 2 weeks doing custom work, and the result we consider to be a fairer and much more satisfactory test of the value of our mines than rock taken from but one ledge. From Mr. Patterson we learn that out of 30 tons of rock crushed for Fred. Forster he obtained \$900, from 18 tons crushed for Nick Marling, \$700, and 15 tons for Joe McLaughlin, a little over \$500. Mr. P. is the owner of the Sonora ledge, situated near Ophir, which has been recently opened, from which he is taking very rich rock.

The Yolo Co. have had some rock crushed from their mine, at the Green mill, the returns from which were so flattering that the Co. have determined to develop the mine in a scientific manner.

SAN DIEGO.

SAN DIEGO WORLD, May 3: Several claims are now being worked with splendid promise that have been abandoned for years. Amongst others, the Great Eastern, which is owned by G. P. Powers. The Messrs. Dwyer, Kowalsky, DeFrees, and Taylor have purchased and are actively working the Van Wirt, which had also been abandoned. These mines all give promise of a satisfactory pecuniary outcome. The ore from both at the present slight depth, grades \$35 to the ton.

The Owens brothers are still sinking, but propose to commence taking out rock to crush at 25 ft. The accounts from the Golden Chariot are most flattering. As a result of their crushing, so far, they have about 240 ounces of amalgam on hand. This will average \$12 to the ounce. They have some 500 tons of ore ready for the mill, and the lowest estimate put upon the rock is \$25 to the ton.

The San Jacinto and Union Co. have begun work, under the supervision of Lloyd.

TUOLUMNE COUNTY.

THE SPARK GULCH CO.—Sonora Independent, May 10: Have recently crushed 130 tons of rock—resulting in 155½ ounces or about \$2,500.00.—The total expenses of working this amount of rock was \$1,100.00—leaving \$1,400.00 clear profit to be divided among 5 shareholders. In view of erecting new hoisting works on a large scale in the spring of the mine, and the fact that a natural stream of water in use will give out in August, but the proprietors in prospecting the hills above have discovered a stream that, with an outlay of about \$2,000.00 can be brought to the mine that will last the year round.

BROTHMAN.—Is situated about 18 miles east of Sonora, and about 2 miles from S. ring Gulch. The lead is owned by Cashwiler & Tullock—J. Tullock, Superintendent. Will commence operations the coming week, and will work 10 or 15 men, as the case may require. The vein is 15 ft. wide, and rock is said to pay \$15 per ton. Shaft in the old works, 150 ft.

THE GOLDEN GATE.—In the Golden Gate shaft, the boys have struck pay-ore which gives prospects very rich. Mr. Long, the Superintendent, informs us that in the tunnel the vein shows a width of 9½ ft., the hanging wall not heard from.—The sulphates are rich, and the rock carries good pay in free gold besides.

YUBA COUNTY.

BROWN'S VALLEY.—Marysville Appeal, May 11: A few additional items from the above mines were obtained yesterday. 150 tons of paying ore has been raised, and there are about 50 more tons broken in the mine and ready for raising. The hands are working day and night in the drifts and shaft, and the Superintendent expects to be able to keep the stamps in motion. The Superintendent intends to go down with the shaft as deep as the stamps will permit, and as drift northward through the old Pennsylvania ground into the Danneberg claim, culling all the pay chimneys as the work progresses. By this course Superintendent Stoch will be able to obtain much valuable rock which former miners endeavored to get by sinking their shafts. During the winter the engine at shaft No. 1 consumed about 10 cords of wood per day, but this is now run with 3 cords. The estimated value of the mine and mill property is estimated at \$5,000, and it is anticipated that 1,000 tons of ore can be raised and crushed. The ore raised and in sight promises to pay well—the best of it from \$20 upwards. The mill is furnished with silver pistons manufactured by O. Lawton & Co., San Francisco, which cost \$1,500.

YREKA.

KLAMATH.—Yreka Times, May 10: This mine on Salmon started their new 32-stamp mill on Monday. There are, now employed about this mine and mill some 80 men and soon a much larger force will probably be put on.

Nevada.

ELY DISTRICT.

AMERICAN FLAG.—Pioche Record, May 10: This mine is proving itself to be one among the richest after the Nevada. The ore here is of the richest kind, and has lately been struck on the 5th and 6th levels. From 25 to 30 tons of high-grade ore are being hoisted daily, and the company's mill is running regularly, yielding most satisfactory returns. The ore is being hauled to the mill as fast as hoisted.

BULLION.—Four large bars of fine bullion from the Bullion and will be shipped this morning by Wells, Fargo & Co.

RUMON says that 24 ft. of solid ore, much of it of the rich chloride class, has been struck deep down in one of the celebrated mines of Ely district.

BELMONT.

EL DORADO.—Reese River Reville, May 10: The big strike in the south end of the 400-ft. level is creating much excitement. This lower level in running south for the last 100 ft., was run in the hanging wall. Yesterday a crosscut, at a point 240 ft. south of the main incline, opened out one of the finest bodies of black metal ever found in this section. Stripping the ledge as the work proceeded, and the stratum being followed back parallel with the drift towards the incline.

Seven more bars of bullion were shipped this morning from the express office here, 4 from El Dorado and 3 from Belmont Co. This makes 15 bars so far this week.

ROBINSON DISTRICT.

HAYES.—White Pine News, May 10: We were kindly shown through the underground workings by Superin-

tenant D. T. Elmore, and found that at the depth of 150 ft. the vein which has been traced from the surface some hundreds of feet, was found running easterly from the hill on which the mine is situated. A large body of ore is now in sight, and one fact demonstrated, viz., that depth exists in the mineral wealth of Robinson District.

ALTUN.—This remarkable location can be described no better than by comparison with the mines in Eureka district on Ruby Hill, differing from them only in the greater value of the ore, particularly in its gold-bearing quality. Hendrie, the lumber dealer, being one of the party, having been to the mine for some experience, and with him "pan out" some of the fine ore lying at the furnace erected on the companies property. We procured a tin pan (a little greasy from the last batch of beans cooked in it), and took about 20 lbs of the finest dirt from one of the numerous piles, and went to work. The result was as fine a prospect as one could wish to see, being 25 cts. worth of fine gold. The main shaft is down 180 ft., all the way in ore of high grade and a tunnel has been driven in 640 ft. from the face of the hill, which cuts the ore channel at about 600 ft., making a known width, at the present time, of from 40 to 60 ft., all good paying mineral. Mr. Ogden informs us that he will soon commence building another furnace, when active work will be resumed.

WASHOE.

BELCHER.—Gold Hill News May 10: Daily yield over 550 tons, 200 of which comes from the 1300-ft. level, through the Yellow Jacket shaft. The ore stopes and hauls in that and the other producing levels are looking finely, as usual. The main incline is now down 124 ft., below the 1200 ft. level. The drift north at the 1200-ft. level is in 277 ft. from the incline, and the drift south from the stopes to connect with it is 453 ft., leaving only about 20 ft. to complete the connections. Drifting south at the 1300-ft. level is not resumed as yet, as the timbering in the Yellow Jacket shaft is not yet completed. It with the level above is also being widened and timbered for ore-raising purposes. When the drift connection with the main incline is completed at the 1200-ft. level, with the incline, the ore from the 1300-ft. level will be hoisted through the winze aforesaid and sent out of the 1200-ft. level and raised through the Belcher incline and shaft instead of through the Yellow Jacket shaft as at present.

BALTIMORE CONSOLIDATED.—This mine continues to be the centre of attraction at this end of the ledge, from the important and still improving developments made in it, in the shape of a good body of rich pay ore, the extent of which is not yet ascertained. The west drift at the 250-ft. level has been cut into the new ore body 29 ft., and shows a sign of being on the vein. The second or 550-ft. level is being rapidly driven ahead.

CROWN POINT.—Daily yield 480 tons. The various ore producing levels continue looking and yielding finely as usual, especially the 1300-ft. level, which hides fair to yield better than either the others, and hold out longer. The cross-cut from the 5th floor above this level is being driven in the hanging wall, over 40 to the ton, and the winze from the 1200-ft. level is down 103 ft. all the way in fine ore. The main incline is down to the 1500-ft. level, and the station timbers are being put in for that level. The drift south at the 1400-ft. level is in 157 ft.

UNION CONSOLIDATED.—Drifting and prospecting in the main ledge, with plenty of ore, which gives little anxiety. The company justly consider that they are not deep enough, and are about starting a new shaft some distance east of their present working. This is to be a good sized working shaft, and will be sunk to the depth of 1,000 ft. before drifting for the ledge.

VOONVILLE.—Daily yield about 35 tons, which is all as much more than the Russell and Jones mills can crush. The drift on the 1400-ft. level is being driven, and the winze from the ore-dump run from \$30 to \$120 to the ton. Both mills are kept steadily running to their full capacity.

JUSTICE.—The drift south of the 400-ft. level is progressing with favorable indications. Some very good ore is being taken out near the south line, 200 ft. below the 400-ft. level.

JACON LITTLE.—Upper tunnel in 380 ft., developing a large, fine ledge of both silver and gold. The latest assays ran from \$180 to \$200 to the ton, about one-third of which is silver.

GEHRA.—The north drift at the 1,300 ft. level is going ahead as usual, with very encouraging and improving indications. The drift on the 1,400-ft. level is being driven, and the winze from the 1,455-ft. level. Forty tons of good ore has been taken from the old works and sent to the mill. If it turns out well, there is more where it came from.

YELLOW YACER.—The east drift at the 1,500-ft. level is in the ledge, showing good quartz with porphyry and no ore. The water has been let out and does not interfere with the work. At the 1,400-ft. level, connection has been made with the north winze and drifting both north and south proceeds as usual. Nothing doing at the 1,300-ft. level.

KNICKERBOCKER.—The reports of a strike in this mine during the past week are assuming definite shape. We are informed that the assays have improved considerably during the past 3 days and the ore dipping to the east. The body of water tapped impedes further development very materially at present.

SILVER HILL.—The Bacon mill is still kept running steadily on ore from this mine. No new developments. Average ore assays \$34 per ton.

HASE & NORRIS.—Daily yield, 75 tons. The timbering in the 1,400-ft. level is being driven, and the winze is going ahead actively, and will be completed in about 3 or 4 weeks. Cross-cutting at the 1,700-ft. level is going on as energetically as the heat will admit of, with no new ore developments as yet.

SAVAGE.—Drift north at the 1,500-ft. level to connect with the Gould & Curry, and at the 1,700, to connect with the 1,800-ft. level. The drift on the 1,800-ft. level is being driven, and the winze is going ahead actively, and will be completed in about 3 or 4 weeks. Cross-cutting at the 1,700-ft. level is going on as energetically as the heat will admit of, with no new ore developments as yet.

CHOLLAR-PODS.—Daily yield, 185 tons, all from the old ore producing sections. Average assays, about \$33 per ton. A new and good development of pay-ore is reported to be made at the 750-ft. level near the Halse & Norcross line.

IMPERIAL.—The drift south of the 1,700-ft. level, as well as the cross-cut from it, is in quartz and porphyry. A winze connection being effected with the level above, better air circulation is afforded. Sinking is resumed on the incline.

DANEY.—New shaft down 77 ft. in good working rock. Gould & Curry.—The new pump in the incline proves effectual in keeping the water out, and sinking is actively resumed. Prospecting at the 10th and 11th levels developed only barren quartz and porphyry as yet.

SEARON.—Total depth of shaft 335 ft., 20 ft. having been added during the week. No water interferes, the machinery works well, and all operations go ahead smoothly and effectively.

BUCKEYE.—Daily yield about twenty tons. The winze below the first station is down 82 ft. in good ore, and the regular ore producing sections all show finely.

LAKE.—The ore taken out this week shows considerable free gold, mixed with black sulphurets. Still drifting north with good progress.

LAMO.—Sinking deeper and progressing as usual, the rock showing improvement and growing softer. Very little hoisting is required.

Arizona.

MINING IN YUMA COUNTY.—Arizona Citizen. The Castle Dome mine is being vigorously worked by its proprietors. There are at our landing 60 tons of ore, for shipment to San Francisco per Steamship "Newbern." The only draw back to this mine is the high prices asked for transportation of ore from the mine to the landing. But even this is being removed every day by the proprietors putting ox teams of their own to work. The Silver Hill mine, located in the Blackhead, (Ca-

beza Prieta) mountains, 40 miles south of the Olla river and about 75 miles from this city, was discovered and located, not long since, by Alvah Smith. The ledge is 2 ft. wide and about 1500 ft. long. The ore will average at least \$100 in silver to the ton.

The Golden Era is a gold-bearing quartz mine, situated about 15 miles south of Rattlesnake, and 45 from this city. The vein is 4 ft. wide, and prospects very rich. No assay of this ore has yet been made; it will in our opinion, go \$200.

The Kerr mine is only 20 miles from here, near Gila City. Its ore assays \$50 in silver and \$40 in gold to the ton. The vein is 6½ ft. wide, and is owned and worked by Col. A. F. Rockwell, A. Smith, A. Long and O. E. Buck, each having 1500 feet.

RICH DISCOVERIES.—San Diego World, May 3: We were favored with a call from Mr. Lallier, who has spent some months in Arizona, and who brought in with him some rich specimens of silver ore collected on the Arizona and Sonora line. The region from which this rock is taken is remarkably rich in minerals. Some of the ore shown us by Mr. Lallier is very strongly charged with galena. Other specimens show copper. The percentage of silver is large, and there are considerable traces of gold.

These specimens were mere surface croppings. The ledges are about 2 ft. wide at the surface, and extend for an immense distance. The locality prospected is distant from Yuma city about 80 miles. One of the ledges has been called "Silver Queen," and the ore from it is of a specially fine quality. Mr. Jones, Mr. Lallier and others, are interested in the mines, and they are destined shortly to have a very handsome outcome, we have no doubt.

Colorado.

MINING ITEMS.—Colorado Herald, May 7: But little mining is being done in Russell District this year. Joseph Shinnaman, Strader & Co., have leased the Missouri and are raising mill ore that yields 8 ounces per cord. Paul & Sawyer have been raising very valuable ore from the Wantoga ledge. Mr. Thnh is operating profitably on the Lancaster ledge at the head of the Virgin canon. His mill ore was 8 ounces gold to the cord. He has sold 6 tons of ore to the Whale mill company for \$100 per ton.

Monday & Taylor are raising one ton of smelting ore per day on the Leavenworth ledge, in Leavenworth gulch, beside large quantities of mill ore. Bors & Co., are doing equally well on the adjoining claims.

Mining is carried on steadily and profitably on Seaton Hill, above Littleton. The Seaton ledge is worked in two places. Ford, Lewis & Seaton are working on the 100 ft. level in their mine, and are raising large quantities of valuable ore. They are also raising ore from the deep shaft, at the bottom of which, 270 ft. below surface, they will commence drifting. They have from one to two million dollars worth of ore on the Seaton dump. T. J. Dean is working on his claim and is taking out large quantities of rich ore. The quartz from these mines is sold to the B. & O. Smelting Works at Black Hawk.

EMPIRE.—Gen Munson is selling ore regularly to Pearce's Swanes Smelting works at good prices from the Tenth Legion ledge. He is working at a depth of 200 ft., and has a crevice of good size with plenty of ore in sight.

Montana.

TUCKER GULCH MINES.—Helena Herald, May 1: Wm F. Wheeler & Co. own 160 acres of mining ground lying east of "Tucker" and includes the famous "Uncle Sam" ledge. Collins & Walker have a patent for 47 acres in Tucker, joining the above claim on the west. These mines have been prospected and worked from time to time, as much as the small supply of water would permit. In 1855, large quantities of gold have been taken out and there yet remains about three-fourths of the ground untouched.

Since January, 1872, about the time that Mr. Blais Walker purchased his half interest therein, the claimants have put in a 16-inch flume, 1,900 feet in length, 475 feet of which is set in a tunnel, cut through solid granite, at a cost of \$9,000. They have constructed such capacity as such capacity as to supply 180 inches of water for ten hours' working with a hydraulic; from this reservoir they have laid an iron pipe, 5 inches in diameter, giving them a "head" of about 90 ft. perpendicularly: to the end of this pipe is attached 130 ft. of hose with a two-inch nozzle. Here was a successful opening of a valuable mine, and a supply of water at a rate cannot fail to yield a large rate cannot fail to yield a handsome income. If not a large fortune. The precious metal is there, for I saw it with my own eyes.

We yesterday saw at the Cosmopolitan a gold brick weighing 94.77 oz., 838 fine, and of coin value \$1,641.70, being the result of a run in the Harvey mill, Grizzly Park, upon 54 tons of ore from the McCrea ledge, at the head of Nelson. This is the third run made on ore from this ledge, the first paying \$14, the second \$19, and this one \$80 per ton greenbacks. This ledge was discovered last August by Mr. McCrea, and it is thought by many to be the extension of the famous Park ledge. It is developed to the depth of 130 ft., and has a crevice of from 6 inches to 2 ft.

A. Davis ledge, at Cherry Creek, named after its discoverer, is supposed by a majority to be the largest yet found in this district. The shaft is 60 ft. deep, and at the bottom the crevices shows a width of 8 ft. I saw returns of 3 assays made from rock taken from this crevice. The lowest went \$60 dollars to the ton, the next \$125, while the highest reached the good grade of \$175. There are said to be many more of these high-grade ores. There are many more ledges embraced in this district, several of which will compare favorably with those I have enumerated.

BULLION.—Montanian, May 1: Messrs. Wiant & Lehman of the Clipper mine, Silver Star District, on Sunday last sent up to Banker Elling, for shipment, another batch of 80 ounces of bullion from their ledge. The regularly with which these shipments are made, justifies us in saying the Clipper is paying a handsome profit to its owners, and is the treasure-house of the district.

ANOTHER CLEAN-UP.—Helena Gazette May 7: Messrs. Keating & Blacker have just made another run and clean-up at their quartz mill at Keatingville, Jefferson county, and the result is: 520 ounces of gold retort, which was brought to this city yesterday by them in person and deposited in the First National Bank. The value of this bullion in currency is about \$12,000. It will be remembered by our readers that it has only been a few days since Messrs. Keating & Blacker made their first run of the season, which was valued at over \$14,000. These runs are from the average rock on the dump.

URAL MINING Co.—We have received the prospectus of the Ural Mining Company, Oswego N. Y., a company organized to work mines near Ellsworth, Nye county, Nevada. The company claim level lying parallel to each other known as the Vernon, Adrian, Oakland, Gould & Curry Nos. 1 and 2, Ural and Union, covering in all 6,375 feet.

SILVER CITY, NEV.—Under date of May 9th, J. D. writes: Times are quite lively, and stocks are going up. The mills are nearly all running, and there is considerable prospecting being done outside of the large mines. Also some surface mining and about American Flats.

New Incorporation

WATSON M. Co.—May 10. Location: White Pine, Nevada. Capital stock, \$3,000,000. Trustees—S. A. Raymond, D. P. Elmore, Henry Raymond, Ohas. Jones and Wm. H. Watson.

Edible Cacti.

GIANT CACTUS, (*Cereus giganteus*).—This noted plant of the barren hills of Arizona is commonly called monumental or giant cactus. It grows twenty-five or fifty feet high, and four and a half in diameter, is deeply ribbed, and covered with long black spines. Its fruit, Fig. 1, is pear-shaped, of a greenish-yellow color, with a few small spines scattered over the surface, which fall off as the fruit becomes thoroughly ripe. The fruit is borne upon the highest part of the plant, and is usually gathered by means of long, hooked sticks.

The interior of the fruit is of a beautiful red color, and looks tempting; the rind is pulpy, fibrous, juicy and sweet; the pulp is very palatable, and is full of small black seeds, which are also eaten, reminding one of figs, the only difference being that it has more moisture. The seeds are indigestible, unless well chewed. The Indians of Arizona, Sonora and the southern portion of California consider this one of their greatest luxuries, and as long as the fruit is obtainable care for nothing else.

To dry this fruit as a preserve, the seedy pulp is placed between soft inner corn husks, the ends of which are tied, and is then dried in the sun, for winter use or trade. It is also put into earthen pots when fresh, seoured from the air, and sold in the settlements. It retains its sweetness for a long time. A clear, light-brown syrup is expressed from the pulp, and sold in one gallon jugs, (also made by the Indians,) for \$2 to \$5. The Papajo Indians are the largest producers of this syrup. The Pimo Indians, of the Gila river, annually prepare a wine from this fruit, called by the Mexicans tiswein, by taking the fresh pulp or the syrup and mixing with it a certain quantity of water in earthen vessels, and exposing it to the sun for some time to ferment, after which it is fit for drinking.

It is highly intoxicating, with the taste and smell of sour beer; but some time elapses before its stimulating effects are felt. When the wine is ready for use, the Indians celebrate an annual drinking festival. These gatherings are anxiously anticipated for months, and expeditions which have been planned against the Apaches, while under the influence of drink, are then carried into execution. It is of a clear, amber color, and in every respect superior to much of the wine on sale.

Thuber's Cactus.

(*Cereus Thurberi*.)—This is commonly called pitahaya by the Mexicans. It grows in the Papajo Indian country, on the borders of Arizona and Sonora, eighteen to twenty feet high, and four to six inches in diameter, and bears two crops of fruit per year. The fruit is the size and shape of an egg, and is thickly covered with long, black spines. As it ripens it becomes tinged with red, the spines fall off, the fruit splits open, and exposes a rich red, juicy pulp, with small black seeds. This is decidedly better fruit than that of the *Cereus giganteus*, but it is used in every respect for the same domestic purposes.

The Papajo Indians, in transporting earthen vessels filled with syrup or preserves made of the fruit to market, cover their jars with a thick coating of mud, which renders them less liable to break in handling, and at the same time keeps the contents cool, and prevents evaporation, the crockery used being very porous. The fruit is eaten in enormous quantities, and, being very nutritious, the consumers quickly acquire an extraordinary increase of bulk. In making wine or a syrup the seeds are easily separated from the pulp by the use of water. They are carefully collected, dried, parched, and pulverized, after which process they are digestible and nutritious.

THE PEASIMON, (*Diospyros Virginiana*).—This fruit grows abundantly in the Indian Territory and Arkansas. The Indians consume large quantities of it when ripe. It is prepared for future use after the manner of making apple-butter.

Echinocactus Wislizeni, Fig. 2.

This singular species of cactus is commonly called by the Spaniards biznacha, and being twenty inches or more in diameter, a section of the stem is often employed as a cooking vessel. The seeds are small and black, but when parched and pulverized, make good gruel and even bread. The pulp of the fruit is rather sour, and not much eaten. Travelers in passing the cactus wastes often resort to this plant to quench their thirst, its interior containing a soft white watery substance, of slightly acid taste, which is rather pleasant when chewed.

It is a common sight to see on each side of the road these plants with a large perforation made by the thirsty traveler. An Indian, when traveling and wishing to make a meal, selects a large plant, three feet or more long and two in diameter, cuts it down and hollows it out so as to form a trough; into this he throws the soft portions of the pulpy substance which surrounds the central woody axis, and adds meat, roots, seeds, meal, fruits or any edible thing on hand; water is added, and the whole mixed together; stones are then highly heated and dropped into the mixture, and, as they cool, are taken out, licked clean, reheated, and returned to the cooking vessel, until the mixture is thoroughly

boiled. This is a favorite dish with the Yabapais and Apaches of Arizona.

The Papajo Indians pare off the rind and thorns of large plants of this species of cactus, letting it remain several days to bleed, when the pulp is pared down to the woody axis, cut up into suitable pieces, and boiled in syrup of the *Cereus giganteus* or *Cereus Thurberi*. If a kind of sugar which is made by the Mexicans is attainable, it is employed instead of the syrup, thus forming a good preserve. These pieces,

little, it becomes stimulating and nutritious. Some Indians roast the leaves of the *Opuntia* in hot ashes, and, when cooked, the outer skin, with the thorns, is easily removed, leaving a slimy, sweet, succulent substance, which is eaten.

The St. Lawrence Mill at Kelsey's.

A correspondent sends us the following, with regard to operations at the St. Lawrence mine,

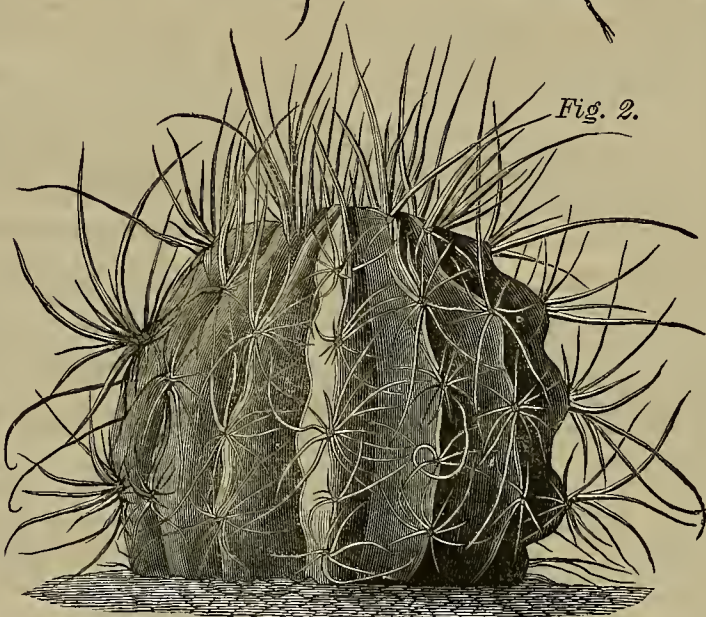
Fig. 1.



Fig. 3.



Fig. 2.



FRUITS OF THE CACTUS.

when taken out of the liquid and dried, are as good as candied citron, which they much resemble in taste and substance.

MULBERRY (*Morus rubra*).—This tree grows abundantly in Northern Missouri and along the rivers of Kansas, the fruit being large, sweet, and of a black color. The Indians will travel many miles in search of it. It is found also in the Indian Territory.

Prickly Pear,

(*Opuntia Engelmanni*, *O. vulgaris*, *O. Camanchica*, *O. Rafinesqui*, *O. occidentalis*, Fig. 3.)—The fruit of these species of cactus is much eaten by all the Indians of New Mexico, Arizona, California, and Utah, under the common Spanish name of *tunas*, great quantities being dried for use in the winter. These plants grow in arid desert localities which produce nothing better; they are large and of a bright red to purple color; of a rather pleasant, sweet, somewhat acid taste, and have thin skins and rather large seeds, which are discarded. The skin is studded with bunches of very fine downy spines, which the Indians brush off with a bunch of grass. The Apaches use wooden tongs to gather the fruit, to prevent being scratched by these spines or thorns of the plant.

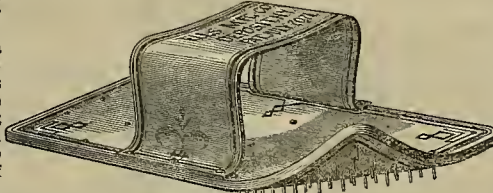
The Pawnees and Papajoes dry the unripe fruit of the *Opuntia* for future use, to be cooked with meat and other substances. The fresh unripe fruit is often boiled in water from ten to twelve hours, until soft, when it becomes like apple-sauce; then being allowed to ferment a

near Kelsey's Dry Diggings, El Dorado county:—This mine was purchased in March 1871 of Robt. Doran by J. C. Bateman, David Bud and Henry P. Machevin.

Fig. I.



Fig. II.



FLEXIBLE CURRY COMB.

There was a tunnel run, which cut the ledge 115 feet from the surface, upon which they had run a short distance and extracted about 150 tons of ore, since which time, it has been worked vigorously by the present owners. The shaft is down now 520 ft. on the vein, with drifts running north and south on the ledge every hundred ft. in depth and varying from 200 to 400 ft. in length. The ledge varies in width from 3 to 10 ft. and yields from \$9 to \$30 per ton, free gold. They have a 20 stamp mill to which 10 more have just been added. The mill is complete in all its arrangements and can be classed as one of the most perfect mills on this coast. It has been crushing thirty tons every 24 hours; when the additional stamps are running the mill will be able to reduce 45 tons in the same time. They have a 35 horse-power engine at the hoisting works and a saw-mill attached, where they saw their own lumber and timber for the mine. The hoisting works are located at a distance of 75 feet from the mill. As the ore is hoisted from the shaft it is run on a track and dumped into the ore-house, from whence it passes through the rock-breaker to the feed floor. The pulp after leaving the battery passes through Henley's Concentrators, when the sulphurets are saved, after which it is caught in reservoirs below.

One-half of the property was sold some two months ago to some English capitalists for a large amount, and I think they will not have occasion to regret their purchase. One of the original owners, Machevin, is living at the mine and has been since its purchase superintendent of the same.

Flexible Curry Comb.

We herewith give illustrations of a new, patent flexible curry comb, that seems to possess peculiar merit, in its complete adaptability to every part of the animal upon which it is used. All who have the grooming of horses are aware how sensitive the animal becomes, when the harsh and unyielding teeth of the ordinary comb is made to pass roughly over the points of the bones of the leg and other parts of the body barely skin covered.

The new flexible comb entirely remedies this fault in the old fashioned comb, besides being one that can be easily cleaned, since by doubling it up in the hand, the mat of hair collected is loosened and easily removed. But there is another advantage it possesses and one which should commend it particularly to the notice of manufacturers; it is a comb that can be made and sold so low as to enable any farmer in the United States to have one, and still pay a handsome profit to the manufacturer.

A sample can be seen at Wiester & Co's., 17 New Montgomery Street, who are agents for the sale of rights to the Pacific Coast.

The Quartz Mining Interests of Calaveras.

Calaveras has a wider area of quartz bearing country than any other county in the State. The auriferous belt is at least thirty miles in width, reaching from West Point on the east to Camanche on the west, and extends from the Mokelumne to the Stanislaus river. Between the boundaries indicated the country is ribbed with quartz, and there is scarcely a locality in which the richness of the ledge has not been tested. Paying mines have been developed in almost every portion of the territory that carries quartz, and new discoveries are constantly being made as research is continued. While it is true that mills are going up all over the county, and we are making rapid progress in the development of our quartz interests, still the field for operations is so wide that there is yet abundant opportunity for the adventurous prospector and the most favorable inducements for the investment of capital. The present condition of the quartz mining interests of the county is in a great degree encouraging. We hear the most flattering reports from all quarters, and feel justified in saying that the yield of our mines the coming season will be at least double that of any former year. We base this opinion upon the fact that a number of comparatively new mines are just becoming remunerative, while in many instances those that have paid in the past have greatly increased their former capacity for production. Prospecting is also extensively carried on, and before the lapse of another year it is more than probable that additional batteries will be put in motion. Capital no longer holds aloof, but in combination with labor is very materially assisted in forwarding development and receiving large returns for the investment. Wherever labor makes a fair showing no difficulty is experienced in putting up the requisite machinery for working, and to that fact, more than anything else, is due the flourishing condition of affairs to-day.

With the opening of spring, has come a splendid revival of the quartz mining interests of the eastern portion of the county. Times have not been so lively in the "upper country" for several years as they are at present. At West Point work has been resumed upon the celebrated Zacatero mine. New and extensive hoisting works are being erected, and everything placed in proper condition for active operations. The Lone Star, Ohio Consolidated and a host of others are yielding good rock. Not a mine in the district is idle. At Railroad, the Wolverine and Sanderson continue to pay largely, and a great number of less extensive claims are paying handsomely. In the Mosquito District work is going on vigorously. The Good Hope hoisting works are nearly completed and the mill is ready to run. The San Bruno, Good Hope, Dolly Varden, Cuba and other mines are showing excellently well. In the Sheep Ranch district, the Wallace & Ferguson mine—one of the very best in the county—is still paying enormously. At Rich Gulch, Central Hill, San Andreas, Angels and the vicinity of Murphy's, operations are being steadily conducted with the most flattering results. Taken altogether the quartz mining interests of the county are in a most promising condition, and the life and activity that pervades that branch of industry is beginning to be felt in other avenues of business.—*Calaveras Chronicle*.

USEFUL INFORMATION.

POSITION OF A RESIDENCE.—Houses on streets running nearly north and south are far preferable to those located on those going east and west in a sanitary estimate. In the first, here at the north of the equator, the sun shines brilliantly in the forenoon on the front, and with nearly equal force in the afternoon on the rear. Thus dampness is expelled and the whole edifice is dry and the air far purer for its solar exposure. If a house is on an east and west street, those fronting north are decidedly the best for a residence, because the sun's action on the yard, the kitchen, and usual regions of neglected accumulations, purifies and modifies the humid atmosphere that is sure to predominate in yards and the back side of houses whose rear is north of the street. Thus circumstanced, the back rooms are never so pleasant, cheerful or economically warmed in winter or ventilated in summer, as when on the south side. Opening on the street, the frame of each gets both light and air by reason of the frequent swing of the front door. Here is a law of health in a nutshell.

"LIMITED."—As the meaning of this word as applied to English corporations is not generally understood, the following definition may be of interest. In England they have a limited liability Act, by virtue of which, shareholders in a corporation are exempted from all liability for the debts of an incorporation beyond the sum of their shares. A similar law exists in many of our States, but in England it is customary for subscribers to the stock of a corporation, to pay their subscriptions in installments, and under the law they are only bound for the amount remaining unpaid. Hence the use of the terms "paid" or "unpaid" in their stock report, as either shows the extent of the liability of the company. The term "limited" is simply used to denote that the shareholders of an incorporation, are only liable for its debts, to the amount of their unpaid subscriptions, as distinguished from incorporations on the old individual responsibility plan.

WHERE CHLOROFORM COMES FROM.—We are indebted to the insect tribe for chloroform, one of the most powerful agents in alleviating pain. The little ant contains a substance called formic acid, about which old Jobu Ruy and Martin Lester corresponded a century ago; and they found that it contained an acid; and so it got into books as formic acid. It was found to be composed of a compound radical formyle, and three atoms of oxygen. Dumas substituted chlorine for the oxygen, and thus obtained trichloride of formyle, which is chloroform. Then the Americans found that either was capable of taking away all sensations of the human body; and Dr. Simpson of Edinburgh, found that trichloride of formyle was more thoroughly adapted for this purpose than oven either. All this has arisen from a study of the habits of insects.

THE MERCHANT FLEETS OF THE WORLD.—With all our talk about the decline of American shipping, our merchant marine stands first in the world in number of ships, as we learn from the following, which we clip from an English paper:—In an appendix to a memorandum by the German Government upon its navy is the following estimate of the numbers of the merchant ships of the principal powers in 1869:—United States of America, 26,393; Great Britain, 26,367; Italy, 18,822; France, 15,778; Norway, 6,883; Greece, 5,512; Germany, 5,510; Sweden, 3,357; Austria-Hungary, 3,114; Denmark, 2,853; Russia, 2,648; Turkey, 2,200; Spain, 1,414. The figures since 1869 have if anything raised in our favor.

A LUCKY HIT.—A young man of the name of Hicks, recently conceived the idea of dipping matches, after they were tipped, in paraffine, so as to protect them from moisture. For this improvement, we are told, he now receives from a well-known match manufacturing establishment in New York, an income of about ten dollars per day. Matches thus prepared, are said to ignite readily, after having lain in a basin of water an entire night.

A NEW ALLOY FOR DENTIST'S USE.—According to C. Sauer, a dentist of Berlin, an excellent solder for dentist's use may be prepared by fusing together in a Hessian crucible, 2.9 parts gold, 0.1 part platinum, 2.0 parts copper, and adding to the fused alloy 10 parts of aluminum fused under charcoal. This alloy he claims to be free from the disadvantages of all previously employed compounds of aluminum.

ALABASTAR ORNAMENTS may be imitated by brushing over plaster of Paris models with spermaceti, white wax, or a mixture of the two, or by steeping the models in the warm mixture. Or instead of this process, they may be brushed over several times with white of egg, allowing each coating sufficient time to dry. Only models made of the finest plaster are suited for these processes.

WORKING GREEN WOOD.—A correspondent of the *Scientific American* says: Some of my brother wood-workers may not know that the difficulty of finishing a small piece of green wood, as is sometimes necessary, may be overcome by scorching the piece after it is shaped out. A few lighted shavings will do, and you can then file and sandpaper without trouble.

BLEACHING WAX.—Wax is freed from its impurities and bleached by melting it with hot water or steam in a tinued copper or wooden vessel, letting it settle, running off clear supernatant oily-looking liquid into an oblong trough with a line of holes in its bottom, so as to distribute it upon horizontal wooden cylinders, made to revolve half immersed in cold water, and then exposing the thin ribbons or films thus obtained to the bleaching action of air, light and moisture. For this purpose the ribbons laid upon long webs of canvas stretched horizontally between standards, two feet above the surface of a sheltered field, having a free exposure to the sunbeams. Here they are frequently turned over and covered by nets to prevent their being blown away by winds, and watered from time to time. Whenever the color of the wax seems stationary, it is collected, remelted, and thrown again into ribbons upon the wet cylinder, in order to present new surfaces to the bleaching operation. If the weather proves favorable, the wax eventually loses its yellow tint. Neither chlorine, nor even the chlorides of lime and alkalies, can be employed with advantage to bleach wax, because they render it brittle and impair its burning qualities.

GOOD HEALTH.

The Man of Long Life.

The *Scientific American* describes him as follows: He has a proper and well-proportioned stature, without, however, being too tall. He is rather of the middle size, and somewhat thick set. His complexion is not too florid; at any rate, too much ruddiness in youth is seldom a sign of longevity. His hair approaches rather to the fair than the black; his skin is strong, but not too rough. His head is not too big; he has large veins at the extremities, and his shoulders are rather round than flat. His neck is not too long; his abdomen does not project; and his hands are large, but not too deeply cleft. His foot is rather thick than long; and his legs are firm and round. He has also a broad, arched chest, a strong voice, and the faculty of retaining his breath for a long time without difficulty. In general, there is a complete harmony in all his parts. His senses are good, but not too delicate; his pulse is slow and regular.

His stomach is excellent, his appetite good, and his digestion easy. The joys of the table are to him of importance; they tune his mind to serenity, and his soul partakes in the pleasure which they communicate. He does not eat merely for the pleasure of eating, but each meal is an hour of daily festivity; a kind of delight, attended with this advantage, in regard to others, that it does not make him poorer, but richer. He eats slowly, and has not too much thirst. Too much thirst is always a sign of rapid self-consumption.

In general, he is serene, hospitable, active, susceptible of joy, love and hope; but insensible to the impression of hatred, anger and aversion. His passions never become too violent or destructive. If he ever gives way to anger, he experiences rather a useful glow of warmth, an artificial and gentle fever without an overflow of the bile. He is fond also of employment, particularly calm meditation and agreeable speculations, is an optimist, a friend to Nature and domestic felicity, has no thirst after honors or riches, and banishes all thoughts of tomorrow.

Upon the above the *Science of Health* comments as follows:—"This picture is generally correct. The complexion, however, has nothing to do with it. Brunettes and blondes may be equally long-lived. There are fair-haired races and dark-haired races of equal vitality; nor can it be proved that the one outlives the other. As to 'banishing all thoughts of the morrow,' we must also dissent. A prudent man lays in food and fuel for future use; he also plows and plants to procure crops; but he need not worry over them."

Something New About Oysters.

Most people know that a dozen or two of raw oysters, more or less, very seldom will produce a feeling of satiety or oppression at the stomach. There is a special reason for this, not known commonly to the public, nor indeed to physicians.

It is that raw, almost alive oysters, contain their own gastric juice, ready, in fact to digest themselves.

Recently, I have been trying experiments on the artificial digestion of food, and among other matters, my attention was directed to oysters. They were disposed of with singular rapidity, and, carrying investigation still further, I have been able, by actual experiment, to demonstrate that oysters direct from the shell, when submitted to conditions analogous to that in which they would be placed in the human stomach, and without any addition, are positively able to digest a great portion of their own mass.

While being cooked, however, their gastric juice is destroyed by the temperature, and they are then only like any other light food, but if boiled long, their albumen becomes hard and dense, and less easy of digestion. People with weak stomachs, may hence take comfort in the reflection, that there is one article of diet, which they may usually indulge in without fear of after trouble, namely, fresh raw oysters, which, happily, are provided with an assistant to help them in their solution.—*Scientific American*.

Health of Farmers.

Farmers have unequalled natural advantages for health, strength and longevity. The statistics of disease and the tables of mortality, however, are against them. This is not due to their vocation, but to their misuses of it. No class, as a whole, is probably so utterly reckless of health conditions. So far as our acquaintance with the habits of the farmers is concerned—and it has been extensive—it compels the conclusion that, as a rule, the dietetic habits of the farmers are worse than those of any other class, who have the means of choosing for themselves.

Fried dishes several times a day, with several fried articles at each of the three meals, is one of their common dietetic abominations; dried beef, old cheese, and pickles are among the common relishes, while lard and saleratus make their richer dainties infectious and caustic. We have seen on a farmer's table, fried pork-fried eggs, fried potatoes and fried griddle-cakes for breakfast; fried ham, fried hominy and fried parsnips for dinner, and fried sausages and fried doughnuts for supper—all the frying done in lard.

No class is so troubled with canker, erysipelas, tumors, cancers, and humors, as farmers; and the excessive use of pork, lard, fine flour, rich cakes, and greasy pastry, are enough to account for it. In dietetic habits, our farmers are sadly misled by the agricultural journals, nearly all of which pauper to their prejudices and flatter their morbid appetites by recommending and commending swine-breeding and pork-eating, while they fill their kitchen-column with recipes for making "rich and palatable" puddings, pies, cakes, and other complicated dishes, which no stomach ever carried inside of a human body could long tolerate without death or dyspepsia.

The essential need of our farmers is plain, wholesome food, properly cooked. This would give them much more available power for work, relieve them of many of the distresses and expenses of sickness, add many years to their life, and render old age "green" and normal instead of dry and decrepit, as it is in most cases under existing habits.—*Science of Health*.

Deaths from Poisonous Wall-paper.

The Springfield *Republican* records the recent death of R. v. P. Shehan, of Hudsale, Mass., from poison by arsenic derived from the wall-paper of the sleeping apartment of the deceased. The paper was tinted with Paris green. The use of arsenical colors for such purposes should be by law prohibited.

Cases of poisoning from paper hangings are becoming quite frequent. Great numbers of cases, more or less severe are reported, although but few prove fatal. No doubt many deaths have heretofore occurred from an ignorance of the cause, and a consequent continuous exposure, when now more caution is observed, and proper remedies applied. One case was reported a few years since, in England, where four children died successively within two months, in one family, and the cause was not suspected until after the last death, when arsenic was found in the stomach on a post mortem examination. The wall paper on the house was then carefully examined, and it was found that the color was loosely applied without any protective glazing that it readily rubbed off at the slightest touch and then grains of arsenic were obtained from a square foot of the paper. The children all died with symptoms of having been poisoned.

We are told that greens are not the only colors which contain arsenic, nor wall-paper the only fabric colored with arsenical pigments. A correspondent of the *Chemical News*, who is in a position to know, states that the French use the following named pigments, containing arsenic, in calico printing, and that they are equally suitable, and doubtless used, in the color of paper-hangings: *Light scarlet pigment* contained alumina, arsenious oxide, and aurine; *scarlet ponceau* contained carbonate of lime in addition to the above ingredients; *dark green*, a preparation of aniline green and arsenious oxide; *steam chocolate* and *calchou pigment*, both contained arsenious oxide. Hallwachs has demonstrated the presence of arsenic in red, as well as in green-colored wall-paper.

CHRONIC DIARRHEA.—A lady says that she has succeeded in several instances in curing cases of chronic diarrhea, after many other prescriptions had failed by using the following preparation: Take of good brandy, say half a teacup; burn it off by setting it on fire with a match; let it burn till the cup gets hot; then take half a teacup ground cinnamon; half a nutmeg, grated, and add a very little cloves; pour on them half a teacup of boiling water, and fill up the cup with crushed or granulated sugar; then when each have cooled sufficiently, put in a bottle, and use occasionally, or until you prove its value, or otherwise. I found it the best remedy I ever used, and I am the mother of eight children.

REMEDY FOR CORNS.—A correspondent of *Rural New Yorker* says: Bathe the feet in tepid water, to soften the corns; pare these off very closely with a sharp knife; then rub on well green peach tree leaves; when, after continuing the rubbing once or twice a day, the corns will disappear.

DOMESTIC ECONOMY.

OATMEAL, BONE, AND MUSCLE.—Liebig has shown that oatmeal is almost as nutritious as the very best English beef, and that it is richer than wheat bread in the elements that go to form bone and muscle. Professor Forbes, of Edinburgh, during some twenty years, measured the breadth and height, and also tested the strength of both the arms and loins of the students in the University—a very numerous class, and of various nationalities, drawn to Edinburgh by the fame of his teaching. He found that, in height, breadth of chest and shoulders, and strength of arms and loins, the Belgians were at the bottom of the list; a little above them, the French; very much higher, the English; and highest of all, the Scotch and Scotch-Irish, from Ulster, who, like the natives of Scotland, are fed in their early years with at least one meal a day of good milk and good oatmeal porridge.

Speaking of oatmeal, an exchange remarks that a very good drink is made by putting about two spoonfuls of the meal into a tumbler of water. The Western hunters and trappers consider it the best of drinks, as it is at once nourishing, unstimulating, and satisfying. It is popular in the Brooklyn Navy Yard, two and a half pounds of oatmeal being put into a pail of moderately cool water. It is much better than any of the ordinary mixtures of vinegar and molasses with water which farmers use in the haying or harvest field.—*Boston Jour. Chemistry*.

TO WASH BLACK CALICO.—Make a clean suds of soft water, wash the calico through it; then pour boiling water into sweet, skimmed milk till there are equal parts of each; turn the calico wrong-side-out and rinse through this compound. Dry in the shade; sprinkle, and when moist through, iron on the wrong side, and I think it will give satisfaction.

ANOTHER WAY.—Put the dress in the washing machine or tub and pour boiling hot suds upon it; rub it out and, if necessary, rub again on the washboard; then have some warm, hard water, with a little salt in it; rinse the dress and dry immediately. Let the water cool before rubbing it out. All that is needed to insure success is to have the water boiling hot when first applied.

BOILED INDIAN PUDDING.—A correspondent of the *Rural New Yorker* gives the following and pronounces it "good." One pint Indian meal; one pint thick, sour milk; one cup sour cream; one teaspoonful soda, and salt, unless boiled in pork water, which improves it very much for some—I prefer clear water. Stir into the latter, fruit; raspberries are best—dried or fresh. If sour fruit is used, a trifle more soda is necessary. Put into a bag, and tie firmly, allowing two to three inches for it to swell. Boil one hour; a little over will not hurt, but is not needed. The water should be boiling when the pudding is put in, and he kept boiling. Serve with cream and sugar.

TO CLEAN CLOTH.—Grease may be removed from cloth with a mixture of curd soap dissolved in water and oxgall. This should be well rubbed in till spots of grease, etc., disappear. Then sponge over with warm water, to which a little soap and more oxgall have been added. Rinse in clean water, and when nearly dry press with a hot iron on the wrong side. Fuller's earth may be added to the soap mixture for black cloth, and light clothes may be cleaned by merely covering them with a paste of pipe-clay and water, letting it dry, and then brushing it off with a clean brush.

BRINE FOR PICKLING PORK.—Persons who have tested the following, commend it as giving the best pickled pork that they have ever eaten: 8 pounds of salt, 2 ounces of saltpetre, 3 ounces of soda, 2 pounds of brown sugar, to each 100 pounds of pork or hams. The meat must be kept carefully under the brine. If this is done, the above will be found to be salt enough for keeping the meat well.

HIGH PRICES AT THE DIAMOND FIELDS.—A Cape Town correspondent says: "Talk about high prices of provisions at home! Don't mention them after the almost prohibitive prices for almost every article of food at the Diamond Fields. Had the philanthropic Soyer been living, I think he would have made a trip to West Graqualand, for the purpose of working a gastronomic reform amongst the digging community. Here are a few specimens of the prices (or rather extortions) at the New Rush (De Beers): Turkeys, each £2 4s; ducks, 7s 6d; geese, 10s; fowls, 5s; pork, from 1s to 2s per pound; eggs, 5s per doz; butter, 5s per pound; two small cabbages recently sold for 5s each; but even if they had been drum-head cabbages I think the diggers would have been justified in trying the vendor by a 'drum-head' Court martial. At Dr Toit's Pan, a small dish of green peas fetched 8s, and grapes 1s a bunch! so that you will perceive we in South Africa can rival the London butchers and poulterers for dear meat and poultry, and Covent Garden Market for expensive vegetables and fruit. However, the Diamond Fields form an exceptional case. Even the very fowls seem to live extravagantly, and to be impressed with the greed of gain, in proof of which I may mention that lately a fowl at the New Rush was found to contain a one-carat diamond, a pair of gold earrings, and a number of small crystals. Surely, wringing the neck of such a valuable fowl as that, would seem to be as mad an act as that committed—according to the legend—of killing the goose that laid the golden eggs."

MINING SCIENTIFIC PRESS

W. B. EWER.....SENIOR EDITOR

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Saturday Morning, May 17, 1873.
San Francisco:

Legal Tender Rates.—S. F., Thurs., May 15.—
buying 85; selling 86.

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The Horticultural Exhibition.

Every one visiting it is delighted with the floral exhibition now—Thursday, May 15th—in progress at the hall of the Bay District Horticultural Society, corner of Post and Stockton streets. To say that it is a magnificent floral display well worthy the attention of the public, is to convey but a faint idea of its real merit. Here the connoisseur and amateur of beautiful flowers, can find him or herself in the midst of a profusion of the most rare and exquisite floral gems known to flower culturists.

Not only an hour, but a day can be well and interestingly passed in examining into the varieties and beauties of this miniature flower world. And then at evening, the keen and spirited rivalry between these mute beauties and the vocal ones, that seem to be vying with them for supremacy, with the blaze of innumerable gas lights and the refrain of voluptuous music, together make up a scene that no one with the least spark of love for the beautiful or taste for the exquisite should fail to witness.

THE STEVENS' FURNACE at Eureka has been pulled down and re-modelled. It is now very much like the one built in this city for experimental purposes. It will shortly be running, when we expect some details of its practical results. The *Sentinel* says the furnace did not work satisfactorily in the first trial. The heat was a complete one and all that could be desired, but the plan of the amelter was not exactly the proper thing.

COPPER IN JAVA.—Mr. Jonker, a mining engineer, has written an official report concerning an investigation as to the existence of copper in the island of Timor, which he had been commissioned to make by the Government. He has come to the conclusion that in none of the places examined by him is the quantity of copper large enough to induce people to work the mine.

THERE is a firm in St. Louis now building a machine which is designed to cut and take up grain, and at the same time to plow and seed the ground.

Admiral Porter vs. Victor Hugo.

In a late issue we commented on the misplacéd confidence displayed by the advocates of movable torpedoes. We are necessitated to return to the subject by a rather startling report which reaches us from New York, and which proves our assertion in regard to the national state of feeling on the torpedo question to have been well founded.

It seems that there is in process of construction at the Brooklyn Navy Yard an indescribable monster; whose attributes, as feelingly portrayed by a reporter of the *New York Times*, are such as to fill us with a vague, indefinable, hair-on-endish sort of horror. It is the impenetrable mystery that hangs over the future navicide, rather than its intrinsic merits (we are obliged to confess that the latter are somewhat obscure), which compels the reverent adulation of heretofore scoffing unbelievers. Ample scope is thus allowed for the free range of imagination.

Cannot we conceive the *Glatton*, or the *Kron Prinz*, or the *Peter the Great*, to be possessed of consciousness, and to be actually frightened out of existence, (as was the condemned criminal in the famous experiment of the French surgeons), when confronted with the unknown leviathan? With what sentiments of awe, for instance, would a sturdy, common sense English ironclad greet the phantomlike apparition of an unsupported smoke stack, steadily making its way through the pathless deep to the certain destruction of the former? And if the well regulated Britisher were so affected by the dread spectacle, imagine the gloomy resignation of the fatalistic and dreamy German floating battery on noting the ominous presage of a hawk, one hundred and seventy three feet long, circling in terrible majesty about her doomed water-line; or the apprehension that would arise in the excitable mind of the tea-drinking Russian cruiser, when called upon to face an invisible and an invincible foe, surpassing the devil-fish of Victor Hugo's creation, and combining the horrifying qualities of that most respectable monster with the familiar properties of unlimited fulminating silver?

We have ground for the hope that all possible enemies will thus succumb, without a show of resistance, in the fact that the phases described are but specimens of what our kindly demon can do when he lays himself out. There are, however, a few prosaic data, which, with tremulous quill, we will reverently attempt to collect.

Our monster—our own American demon, in whom we are to put our trust, has sprung, Minerva-like, from the teeming brain of Admiral Porter—yet, unlike Minerva, immature. But then, in these matter-of-fact days, infant demons must be nourished on the succulent green leaves grown in the treasury department. These a paternal government graciously gathers, as a matter of course. We submit that the same amount of sustenance could be applied to other and more deserving infants; but probably the very hideousness of this protégé has its charms.

Well, our young demon is expected to arrive at maturity in July. When it comes of age, and is launched on its prospective career of devastation, we may possibly obtain a photograph and full history. Meanwhile, we needs must content ourselves with the meagre intelligence to be gleaned from a course of unsatisfactory interviewing.

Its dimensions are, length, 173 feet; breadth of beam, 28 feet; depth, 13 feet. The material is iron, throughout, and the vessel is built on the compartment and double skin principle. Its outline is that of a shark, only about four feet of the entire length being above water. The propelling power is steam.

But here is the mystery. We are told that a ram projects some forty feet from the true bow. We are told that there are torpedo levers along the sides. We are told that the thickness of the plating is from three-eighths to half an inch. But we are not told how a ram of three-eighths of an inch armor is expected to sink a *Minotaur*, nor how torpedoes are to be exploded in such propinquity with any safety to the manipulators. Is the new vessel a ram or a torpedo boat? Echo answers, "a little of both and a good deal of neither." That seems to be the intention of the constructor. If it is a ram, why is it also an egg shell? And if it is a torpedo boat, where is the necessity for making it at the same time a sea-going steamer? These are precisely the contradictions and manifest absurdities of the

build. And, to add to the perplexity of inquiring foreigners, it is said that there are to be adjustable masts in order to render absolute the universality of the plan; and further, that electricity must come in somewhere. This was to have been anticipated. They will find a place to stow it away—say in the hold. Why, what would it all amount to, in this enlightened age, if there were no electricity about it?

While the "what is it" is yet unfinished; while there is yet time for amendment; while the monster is still in the cradle, we would most humbly submit that there are one or two features not embraced so far as we know, in the design. Why not establish a salt-making or oil-trying business on board, to add utility to beauty? Or a sewing-machine factory of moderate capacity, so that the expense of a cruise to Japan would be provided for? But perhaps these ideas are not new at the Brooklyn Navy Yard. Perhaps even now such alterations are contemplated as shall include the adoption of our suggestions. If we are too late with our advice, we have, at all events, the proud consciousness of having done what we could to complete our last naval curiosity.

The "Salted" Mine Trouble.

If the statement published in the *Salt Lake Tribune*, concerning the sale of the Stafford and Lone Star Mines be true, they have some pretty sharp operators in Utah, as well as on California Street. Much feeling exists in Salt Lake on the subject as more than one "salted" mine swindle is reported. General J. T. Harrison of that city published a card in the *Tribune* in which he develops an alleged swindle, of which he was one of the victims. The story is to this effect. Last December two parties visited New Orleans with two silver bricks which they represented as being taken from mines owned, or bonded by them in Camp Floyd Mining District, Utah. They also brought assays with them of ore purporting to have come from these mines. They succeeded in selling the mines for \$163,000, the payment to be made when the reports of these two persons were verified by a committee of the purchasers, who were to personally examine the mines.

This committee, consisting of three of the would-be purchasers, went to Utah, examined the ore on the dump—which they were assured came from the mines—had the ore assayed, and it was so rich that they reported favorably on the purchase, which was accordingly made. General Harrison, who publishes the card referred to, was one of the committee, and was appointed Superintendent. After returning to the mine and staying two weeks he became convinced that the property was worthless. He took out a number of specimens from the mine, not the dump, which he should have done in the first place, and had them assayed. He says: "J. McVicker's certificate of assay shows 'of no value in lead, gold, silver or any of the heavy metals.' Messrs. Selby and Gunter's certificate of assay shows 'silver not a trace.'" General Harrison says he then traced the silver bricks first exhibited to him in New Orleans, to the Chicago Smelting Works, where they were, he says, purchased by the two parties who sold the mine to them, and then he summoned a party of reliable experts who unanimously agreed that the property was worthless.

General Harrison says that after settling up his business in New Orleans he will return to Salt Lake and try and retrieve what he has lost by becoming permanently identified with the mining industry. He denounces the parties who have swindled him by name and announces his readiness to meet any of them. He stated that schemes of a like character were being practiced by these individuals, who were operating in Galveston, Chicago, Louisville and New Orleans. Since the publication of the card, Major J. D. Wooley, one of the alleged salters, has begun suit for defamation of character against the *Salt Lake Tribune* for publishing the card, signed by Gen. Harrison. He claims \$30,000 damages and expenses of conducting the suit—about \$25,000 more. The progress of this suit will doubtless develop the facts of the whole affair, which will be an interesting one to every one. The *Utah Mining Journal* says there is no doubt the silver bricks were obtained from the Swansea Smelting Works, and struck while the die was hot.

If the mining community of Salt Lake City has no more luck in bringing the guilty parties in this transaction to justice, than San Francisco did in the matter of the big diamond fraud, the result is to be deplored. This thing of salting mines and selling them to unsuspecting purchasers ought to be summarily stopped, and the perpetrators made to suffer and be

made an example of. But while we severely deplore the existence among us of men who would carry on a transaction of this kind, we humbly submit, that it is in a measure due to the carelessness of purchasers. Judging from this card, when the committee visited the mine, they only took ore from the dump to have assayed, instead of getting it from different parts of the vein. Then again three gentlemen from New Orleans came as a committee of the purchasers and examined the mines, reported on them personally, and helped pay \$163,000 in hard cash to acquire the property. In all probability these three gentlemen knew more about a cotton plantation than a quartz mine, and the fact that they swallowed all the assertions of the vendors without taking proper precautions to prove them, shows they were ignorant of the first principles of mining speculations, in which every one thinks the other party, buyer or seller, with whom he is transacting business, is trying to "beat" him, until he finds out to the contrary. This is a good rule to go by after the varied experience of our mining speculators; it is at least a safe one.

If these three gentlemen had done what was proper in their position, not only as investors themselves, but as men upon whose report their friends would base their calculations, they would have employed some man competent to judge of the value of the property, to go with them and estimate it. It does not appear that this was done. They relied on their own judgment in the matter, but the result has probably opened their eyes. They are, perhaps, good business men; the fact of their being able to buy the mine at such a figure is sufficient evidence of that. But would they, if intending to buy a ship or a steamer, of which they knew nothing, have purchased her after casually looking at her lying in the stream, without going aboard. They buying the mine in the manner they did is a parallel case to what the purchase of a ship would have been under the above conditions. Would they pay a man for a crop of grain, wool or cotton, without knowing something about the quality of the staple? If they were not familiar with it themselves, would they not have secured the services of an expert on such matters to give them advice?

Unfortunately, every person who can run a grocery-store, a newspaper, a farm, a ship, or anything else, thinks he is competent to run a mine. Several people who have tried it have found out differently, to their sorrow, but there yet remain a very large number of people who think all they have got to do to make a mine pay is, dig a hole in the ground, hoist up ore, crush it, and put the bullion in their pockets. Geological knowledge is entirely ignored by them in selecting their property. Even common sense, as applied to the concerns of every day life, is put aside by novices in mining operations. A few illustrations like the one in question may save some from similar misfortune, while it is a dear experience to the parties directly interested.

No man ignorant of mines or mining operations has any business to buy mining property, without taking the advice of some well-recommended and honest expert in such matters. Mining engineers of experience and reputation are plenty on this Coast. Their services are always to be had for a compensation commensurate with their labors. It pays better to employ them at first, than lawyers at last—besides it is more satisfactory. Now while we extol the recent occurrences in Colorado, where the honest miners drove several "salters" out of their community, and sincerely regret that such circumstances occur amongst us; we, nevertheless, are quite satisfied that a few such occurrences brought before the people will brush up the public mind, so that they may take warning. Time was when a man could come to San Francisco with 30 pounds of rich ore and a rough msp, and get thousands of dollars for interest in the property he represented, but such times have passed long since. People are too shrewd to invest on such slim chances; they are "too thin" and "wont wash." Perhaps the experience of this city might do for other localities, but if they want to try it themselves, they will find the lesson a dear one. This whole matter will probably be ventilated in the courts, and the origin of these two silver bars be made public.

A FOWLER STEAM PLOW FOR OREGON.—Mr. R. R. Thompson of Portland, Oregon, we are told has ordered one of Fowler's steam plowing apparatus from England, and it is expected to arrive this summer.

WASHOE.—An interesting letter from our correspondent at Virginia City will be found on page 316 of this issue.

Sunday in the Mines.

There is a very large and fine painting by Charles Nahl now on exhibition in a window on Kearny street, in this city, representing a scene entitled "Sunday in the Mines." The accompanying illustration was made from the original drawing from which the picture was taken. The scene is a familiar one to many of the early Californians, who were in the mining camps of "49" and "50," when gold was plenty, and as easily spent as it was earned. Mr. Nahl, who ranks among California's most noted artists, "knoweth whereof he paints," since he has handled a pick and shovel, rocked a cradle and fed a sluice in the red soil of California's golden hills. His portrayals of California mining life are remarkably truthful and natural in all their details. He seized every opportunity to perpetrate scenes with his pencil, that came under his observation; and the result is that he accumulated a vast number of sketches on these particular subjects, for which we would otherwise have had to rely upon our recollection. The figure on the extreme right and the tall man quietly smoking his pipe, as well as the central figure in front of the cabin, are not imaginary persons, but represent people well known in Grass Valley in early days. Mr. Nahl resided there and was personally acquainted with them.

The scene represents "Sunday in the mines." Picks, shovels, rockers and pans are idle, and it is a day of rest. The miners that have them, put on a "boiled shirt," a pair of clean overalls and perhaps black their boots. Some do their writing, some their washing, some mend their tools and cabins, while others give themselves up to horse-racing, gambling, getting drunk or whatever else can amuse their demoralized natures. The Sunday in the mines was not the Sunday of their boyhood by any means, but all enjoyed it in their peculiar manner. It was harvest times for the gamblers and thieves who crowded thickly in such places, and a day of peaceful rest for such as had the inclination to keep themselves apart from the more jovial. The scene is a good one and will be recognized as truthful by those who have ever witnessed similar ones.

The action of the drunken individual with the bag of scattering dust, attacking his pile on a horse race, and the character of the riotous group on the left, fighting over their cards, are portrayals of what is supposed, away from this coast, to constitute the prominent features of life in a mining camp. But the action of the several figures on the right during such scenes of excitement near by shows that not all of California's pioneers were drunkards, gamblers, jockeys, and murderers. The central figure in front of the cabin is reading his Bible to two eagerly listening and interested hearers; the young man in the cabin is writing words of encouragement and hope to those still under the paternal roof-tree or perchance to some waiting maiden, anxiously expectant of words from her roving lover. The individuals on the right are making a washday of Sunday, and one in scanty garments looks dolefully, but with a kind of mirth at the deplorable state of his nether-garments. In the back ground may be seen the hills and gulches whose hidden treasure has drawn this ill-assorted crowd together and in front are some broken miners' tools, the embers of a fire, cans, bottles and all the usual accompaniments of the front yard of a miners' cabin.

Such scenes as this may yet be seen in many camps on this coast; but money is not so plenty now-a-days as it was then, and many of the evil tendencies of our mining population are checked in consequence. Some men will if they have money, "waste their substance in

placer claims were plenty. The parties owning the large hydraulic and gravel claims in this State at present, are, the greater majority of them, steady, hardworking men, who have learned by experience to hold on to what they get and not throw it away on the sharpers and

mistake of supposing that that sort of thing was to last forever. As a consequence of this feeling they became possessed of the idea that they were all millionaires, that if they spent a fortune to-day, they could earn one to-morrow. Accordingly, money was literally thrown away on useless, expensive amusements, gambling, horse-racing, etc.

An excuse for this line of conduct is to be found in the fact that the round of amusements in "49" was then exceedingly limited. Female society, of the right sort, was not there to exercise its healthy influence for good on the community, and round off the rough corners in the characters of the miners. Men placed in the position which they were, suddenly raised from comparative poverty to affluence and even wealth, and at the same time released from the ties and conventionalities of cultivated society, and thrown in with others of lower moral qualifications, with the additional incentive that they were amenable to no laws for their actions, became, in a measure, rough, uncomely, careless, and extravagant.

This state of affairs, with its demoralizing influences, developed naturally the latent tendency of most men to live a fast life and spend their money freely. Others again, although they changed their mode of life, did not change their characters; and these men prospered. Unfortunately, by far the majority of the "49-ers" now amongst us are men who have seen their best days, physically speaking, and whose purses bear no evidence of the sums they once contained.

PATENTS & INVENTIONS.

Telegraphic List of U. S. Patents Issued to Pacific Coast Inventors.

[REPORTED OFFICIALLY FOR THE MINING AND SCIENTIFIC PRESS, DEWEY & CO., PUBLISHERS AND U. S. AND FOREIGN PATENT AGENTS]

By Special Dispatch, Dated Washington, D. C., May 13th, 1873.

FOR WEEK ENDING APRIL 29th, 1873.

FILES.—James B. Johnson, S. F., Cal.
AUTOMATIC GATE.—Joseph P. Ponce, assignor to self and John Miller, Mayfield, Cal.
LUBRICATOR.—John Gates, Portland, Oregon.
ORE WASHER.—Thomas Wren, Hamilton, Nevada.
SASH HOLDER.—Elijah Knapp, S. F., Cal.
VESSEL FOR CONTAINING LIQUIDS UNDER PRESSURE.—Samuel Marks, S. F., Cal.
ROTARY STEAM ENGINE.—William C. Stiles, Nevada City, Cal.
CLAMP FOR DENTAL PURPOSES.—Charles E. Blake, S. F., Cal.
TRACTION WHEEL.—Oliver Hyde, Oakland, Cal.

NOTE.—The patents are not ready for delivery by the Patent Office until some 14 days after the date of issue. NOTE.—Copies of U. S. and Foreign Patents furnished by DEWEY & CO. in the shortest time possible (by telegraph or otherwise) at the lowest rates. All patent business for Pacific coast inventors transacted with greater security and in much less time than by any other agency.

THE WHITMAN MINE.—This mine is located in Indian Springs Mining District, Lyon County, Nevada. It was sold about three years ago, by the Whitman Gold and Silver Mining Company to the present company who have reincorporated under the name of Whitman Silver Mining Co. They have been sinking on their mine for the past five months, and it is said have found a well-developed ledge of good pay ore ten feet in width at a depth of seventy feet from croppings. Some of the ore is very rich, assaying up in the thousands; the owners have started another shaft to strike the ledge two hundred feet from the croppings, and intend to put up hoisting works this summer.

ARTIFICIAL MEMORY.—We have in hand a pamphlet of some seventy-five pages that purports to give a full and effective method of making a bad memory good and a good memory better. It is gotten up by Wm. Nemos, Prof. of artificial memory. Its study, it is claimed, will enable any one to use the natural memory to wonderful advantage, as well as to perform the extraordinary feats of memory with which Mnemonists astonish the world. For sale by A. L. Bancroft & Company, San Francisco; price one dollar.

COLLIERY EXPLOSION.—A dispatch to the dailies from Halifax, (N. S.), states that a fearful explosion occurred in the Drummond colliery, Pecton county, on the 13th inst. The manager, assistant manager, and 75 other men were in the pit, and the stope being on fire, there was no mode of egress from the mine. The fire was raging up to the time the last dispatch was sent and no further details have arrived up to present writing.

THE EMMA MINE FIRE.—Great excitement was caused last week in Salt Lake over the report of a terrible fire in the Emma mine, and many lives lost. The whole thing proved extravagant and untrue, as only the carpenters' and blacksmiths' shops at the mouth of the mine were burned, no one being injured, the men in the mine having escaped through the Illinois Tunnel; the damage done was slight



SUNDAY IN THE MINES.

riotous living" while if they are in moderate circumstances, they behave themselves like men. The majority of the mining towns of this coast are to-day "quartz camps," where the men work for wages and do not have the amount of money to squander that they did in days gone by, when

blacklegs who infest every community where money is plenty. In "49," men who had plodded wearily on at small salaries in the Eastern States found themselves making more in one day than they accumulated in a year at their old occupations, and most of them made the

Seth Green on Fish.

How the Rivers, Brooks, Lakes, Ponds and Bays of the United States are Stocked.

ROCHESTER, April 22, 1873.—“I want to see every lake in the Union become a fish pond,” Seth Green said to me this morning. “And,” he continued, “as there are 647 lakes in this State of New York, just see the waters we might stock with the people's food.”

“Such a provision would give a lake full to about every six thousand of our population?”

“Yes; those bodies of water are small, but abundantly able to support any demand that may be made upon them.”

Forty Years in the Harness.

“Then you are thoroughly in earnest Mr. Green. You propose to make fish culture a national business?”

“Certainly. Here I have been nearly forty years of my life a pisciculturist, and I am convinced that the old fishermen know literally nothing of the rationale of their art. Fish culture is a subject developing day by day. A few years ago the vast spawning operations now practiced by me at the State hatching house, at Calonia Springs, were unknown. Even now general ignorance prevails among the craftsmen. When I went down to stock the Connecticut River with ehad,

The Yankees

Stood on the banks of the stream and laughed at me. The fishermen derided me because I told them that I was going to cheapen fish; the boys hooted at me, and accidentally on purpose they would let a shad fall on me. Thus I became a martyr. These pleasant little episodes made me laugh at first; but at last I got tired of the circus; but it wouldn't adjourn. Time rolled on and shad fell in price because the spawn had proven fruitful, and they became so plenty that the market values fell from \$18 and \$50 a hundred to as low as from \$3 and \$18 a hundred!”

“Yea,” added Mr. Cooper, one of the former Commissioners of the New York State Fisheries, and who was present in the room, “Seth knows more about fish culture than any man in the world. He is thoroughly practical—an angler by nature, a good shot, fond of the bush and forest, always lingering about brooks and streams, turning over stones and finding what there is new in our creation. If he comes upon a bug generally unknown, he can tell you its habits, age and ways of multiplication. He has been a close observer.”

I glanced towards

Mr. Seth Green

To survey him more critically after this brief description of his character. He appeared to me about fifty-five years of age. His frame is stout, but not large, and he has the carriage and ways of a man who has spent much time in the delightful solitudes of angling. He does nothing enthusiastically; never makes a statement without qualifying it; but will talk fish to you until you feel the scales growing on your back. You have half a mind when surveying Mr. Seth Green, to consider him Mr. Shad Green, to look for his gills and fins. He really talks well, and, so to speak, rather humanizes fishes as he proceeds to recount the routine of their lives, their nourishment, domestic intercourse and final maturity. Here is a man whose knowledge of the piscatorial world is vast, and who from boyhood to the present hour has never ceased to labor for the advancement of fish culture—a man who may be said to have produced more animal life than any one living in the world. Rochester has always been his home, and every citizen knows Seth and honors him as one of Rochester's worthy sons. It is fortunate for the State and Union that Mr. Green is superintendent of the fisheries, for, besides possessing the qualities I have named, he does not believe in mere fancy culture like trout spawning—a luxurious and high-toned pastime—but in filling our lakes and rivers with millions and millions of fish for the benefit of our millions and millions of people. We talked long and earnestly upon this subject, and Mr. Green said:

“I am constantly trying

Bold Experiments.

For instance. I placed in the Genesee River in 1871 over 15,000 young shad, with the object of seeing if they would live in fresh water without going into salt water, as their natural habits incline them. They did live and thrive, and in June, 1872, young shad were caught at the mouth of the Genesee six inches long. So up to this point the experiment has proven a success. We intend to keep on finding out the nature of all fish and if they cannot live in other climates and localities than their own just as well as man does.”

“But, strictly speaking, all fish are local. They do not migrate?”

“Yea, that is true. When I used to fish in Lake Ontario I would exhaust one locality, absolutely catch all the fish occupying and dwelling within a certain square. The fishing grounds then became destitute. But when I removed my nets further down the shore, say eight or ten miles, I found that fish were as plenty as ever.”

“You mean

White Fish?”

“Certainly, white fish are being consumed very rapidly. It is now estimated that every four years the quantity of white fish in our great lakes is being reduced by fifty per cent. You then perceive that it will not take long to

completely exhaust all our waters. If other movements were not in contemplation to spawn and multiply, America would soon have none of the tribe. It is too bad when we have thousands and thousands of miles of rivers and brooks, and vast lakes, to say nothing of the minor ponds, that we should not be, as we are by nature, the greatest fish raising people in the world.”

Cheapening Food.

“It would cheapen all kinds of food, it seems to me.”

“Obviously. If you get all the people of America eating shad, white fish, salmon and bass, and if you breed these fish so that it only costs the trouble to secure them, then a most important and nutritious article of food is on the table for a mere song. People will eat fish instead of beef. Beef being in small demand will thus cheapen, and so will all other meats in comparison. Now what does all this mean? It means the elevation of the laboring classes. It tells one that he can go to yonder lake or brook, catch his fish and have them on his table. Socially and morally fish culture is a blessing and a boon to toiling humanity. I am surprised that people do not see the economy involved in it.”

“But I suppose that some notion of its benefits is getting abroad.”

Educating Pisciculturists.

“In this way I am educating men in my employ in the art of spawning, and by-and-by we will have a profession of experts in the country. Every man cannot be a pisciculturist. It requires many qualities and long experience.”

“That is proven by the number of gentlemen in this region whose trout ponds have failed, I suppose.”

“Oh, it is perfectly natural that trout ponds should fail. The water may be bad; their owners may not be experts or assiduous enough, and many of the seemingly unimportant details may be overlooked, whereas they are of vital consequence.”

Bass.

“It is now only fourteen years,” said Seth Green to me, “that fourteen bass were put into the Potomac River by an Englishman, and to-day it is the greatest bass stream in the world. See how they multiply. Another case: Only twenty-four were put in a lake in Orange county four years ago, and now over a ton of bass has been taken out.”

“What do you call the mature age of the fish, say of all species, Mr. Green?”

“All fish—there are exceptions—arrive at maturity, our *genus homo* twenty-one, when they are three years of age. They should be eaten then.”

“Mr. Green, I have heard that you went out to California.”

Taking Shad to California.

“Yes, I went out there and took with me 15,000 young shad and turned them loose in their rivers delivering in the Pacific. It was a great labor to transport them over the Pacific railway—so many changes of water and so little of it along the route; but I worked with my own hands and succeeded in getting through. This is the first time shad had ever been sent to the Pacific coast. Letters from California inform me that they are doing well. So I have been at work all over the United States carrying hundreds of thousands of small fry to stock the waters of the country. My experience among the Yankees was not so pleasant. What do you think of New England generosity—the States of Massachusetts, Connecticut, Vermont and New Hampshire each made a special appropriation of \$50 to pay my labor in making a perfect success in shad hatching; and they sent envoys who came to offer me the \$200! I set loose 15,000,000 in their Connecticut River in one year.”

“How, then, do you sum up the general result of your labors?”

A Few Figures.

“Shad have been cheapened all over the country. We are stocking streams, lakes and ponds day by day. Orders are coming in from all parts of the Union, and we are satisfied with our work. We encourage fishing with the hook and seek to discourage nets and seines. Politics have left us alone and we have left politics alone. We have put ninety-two bass in Brant's Lake, ninety in Tinsed Pond; sixty black bass, sixty black pike, 400 rock bass in Conesus Lake; 100 Oswego bass and 400 rock bass in Schuylers Lake, and also 8,000 white fish; 10,000 white fish in Oneida Lake, and also 10,000 salmon trout; 3,000 white fish, 1,000 Oswego and black bass, 400 rock bass in Hatch Lake; 3,000 salmon trout in Eaton Reservoir, 1,000 bull heads in Chautauque Lake, and 400 gold fish in Irondequoit Bay. These are only a few examples taken at random. In shad hatching a few entries will show the operations at Mull's Fishery in the year 1872:

May 19—Caught 136 shad; seven ripe; 150,000 spawn; water sixty-one and sixty-two degrees.

May 20—Caught 123 shad; nine ripe; 200,000 spawn; water sixty-one and sixty-four degrees.

June 4—Caught 103 shad; fourteen ripe; 230,000 spawn; turned loose 190,000 young shad fry; water sixty-one degrees.

Hatching

Hardly needs any explanation here, yet the marvelous discoveries that have been made in all the processes of incubation should be remembered by the reader. The female is taken when ripe, and her spawn gently removed by pressure and placed in a tin pan containing

cold water. This spawn is then impregnated by exuding the milk of the male by the same process, after which the eggs are placed in a wooden box, and a stream of spring water is made to pass over them constantly. After three months the eggs have become tiny trout, but they are still burdened, for thirty days by what is called the umbilical sack. They are then fed, sized and gradually matured. Salmon are hatched in the same manner. “Do you know,” said Seth Green, as we were driving back, “that I stayed up in a tree two days to see two salmon spawn in 1838, and I am probably the only man in the world who has seen that evolution?” How characteristic of the man!

Shad are hatched in one week, and need nothing but a plain box with a wire bottom, so inclined to the surface that a constant agitation of the water is going on. Seth Green invented this system. Bass, and, indeed, all members of the perch family cannot be hatched as yet, but we do not know when some process may be discovered.—*New York Herald.*

Our Coal Fields.

The rapid decrease of fire-wood in the Sacramento and San Joaquin valleys, as well as on the slopes about the bay of San Francisco, has caused a growing trade in the commodity of coal. We well remember when there were less than half a dozen coal-yards in the city; when anthracite coal sold for \$45 a ton; when “corners” were put up in that essential generator of steam, by C. K. Garrison and others who made fortunes out of their speculation in a single day. Now the supply of coal in our market is so varied and extensive that anything like speculation seems impossible.

The first production of coal on this coast was in 1852, at Newport, on Coos Bay. The owners of the mine at one time owned and run the old propeller Hartford, between that place and this city; but as the steamer could burn a good deal of coal and carry very little of it, the venture was for a time abandoned as unprofitable. Since then the work has been resumed and the coal brought hither by sailing vessels. The Eastport mines, on the same bay, were opened much later, the capital being furnished by Flanagan, Oliver, Mann, and others. This company now own a fine low-pressure ocean steamer, making semi-monthly trips to their mine, and are paying dividends of five per cent. per month on their capital stock. This is far better than most of the silver stocks on the Comstock ledge. We learn, that, though this Eastport mine is already worked below the sea-level, yet the water in the mine is of so slight a depth as to entail no great expense for pumping, as is the case in most other mines. In some of the mines about Monte Diablo, the shafts fill up so fast that the proportion of water removed to that of coal is nearly two tons to one. This, of course, cuts off a great share of profit. Some idea of the importance of the Coos Bay coal trade may be formed from the fact that the clearance of brigs and schooners from that bay, last summer, averaged forty per month. These vessels always carry lumber as a deck-load and coal in their holds; hence the shipments of coal are not as extensive as one would at first imagine from the number of vessels. Still, the shipments from Coos Bay can not fall far short of 22,000 tons per year.

The mines at Bellingham Bay were opened in 1857, just before the outbreak of the Frazer River hegira. These mines are located near Sehome, and belong to the Bank of California. They yield of “black diamonds” in 1872 amounted to only 4,100 tons against 20,284 tons in 1871. This is due to the interruption of work during the first nine months of 1872. Their facilities for shipment are very extensive, the vessels being large ships, instead of the small brigs and schooners used in the Coos Bay trade. The yard of this company is located at the foot of Harrison Street, where they always have on hand a large supply of coal. R. B. Cornwall is President of the company, as well as its general agent. The average receipts from these mines are over 2,000 tons a month. The present cargo price is \$10.50.

The Monte Diablo mines were first discovered in the year 1859, but for a long time the coal was deemed as worse than useless. All the steamboat engineers inveighed against it for clogging their furnaces with “clinker,” while housemaids condemned it for its decidedly sulphurous smell. But it could not long remain out of use at \$7 a ton while Eastern coals were bringing from \$18 to \$22. At last the steamboats Chrysopolis, New World, and Yosemite remodeled their furnaces especially for its use, and it got into general use on the rivers. The steamships of Hollanday's lines to Mexico and Oregon next took it up, and now it is the great steam generator of the coast, though by no means the best in quality. The principal mines in the Monte Diablo region are the Cumberland and Black Diamond, owned by the Bank of California, and the Union, owned by S. B. Whipple & Co.

On Vancouver's Island, in the British possessions, is the best grade of coal found, the mine being located at the village of Nanaimo, about sixty miles north-east of Victoria. The coal from this mine is preferred for steam purposes to all others found on this coast, for the reason that it makes no clinker, has but little sulphur, and does not burn too rapidly, like the

Seattle coal, of which we will speak hereafter. The only objection that we know to it is that its soot in damp weather becomes a sort of pitch which sticks with great tenacity upon the paint-work where it falls, and can only be removed with potash, which generally carries off paint and all. This mine is owned in Victoria, and its agent in this city is Harbor Commissioner John Roeseveld.

The mines on Lake Washington, near Seattle, King County, Washington Territory, have been worked nearly four years, and will eventually become good property, as the quality of the coal produced is excellent, save for steam. The objection against it is that it burns too freely and makes too hot a fire. The engineer of one of our government steamers was obliged to use it last year, and, being ignorant of its rapid kindling, put in such great quantities that it melted the grate-bars of his furnaces. The steamer went down the Sound with a red-hot smoke-stack. But for household purposes this coal stands at the head, as it is free from sulphurous smell, and answers for all culinary uses. It now brings \$11 per ton, while Nanaimo coal is worth \$12, and Coos Bay \$11. But the Seattle mines are very expensive to work, as they have a lake to cross with their cars on ferry boats before they can put the cars on the railroad track. Coal has been discovered near Point Elliot, eighteen miles north of Seattle, and the newly-found deposit is said to be fully equal to that of the Lake Washington mine.

Going further north, we find a discovery of anthracite coal, on Queen Charlotte's Island, but the lead was too narrow to pay expenses. As for Alaska, it is almost a solid bed of coal, and will one day become the Pennsylvania of the Pacific. As for Washington Territory, it is almost certain that she has a continuous bed of coal seventy-five miles long, commencing on the Skookumchuck and ending near Seattle.

From the present prospects, there is no danger of coal-mines proving a bad investment, if so located as to be practically worked, because our forests are being thinned out so very rapidly that wood must increase in price, rather than diminish, hereafter. As a medium of fuel, coal has supplanted wood on all the railroads and river steamboats, even in the great timber-bearing valleys of the Columbia and Willamette, in Oregon, and they have no coal as yet. We know of no better investment for idle capital than a coal-mine located near tide-water, and recommend our impecunious young friends to go and prospect for coal on Puget Sound, rather than lay around Portland or San Francisco, cursing their bad luck. There is no man who will ever get rich by waiting for money to fall in his lap.—*The West.*

A Perilous Adventure.

A correspondent of the *Truckee Republican*, writing from Blue Cañon, gives the following details of a dangerous adventure and miraculous escape of a young girl who was swept through sluice boxes for half a mile without being killed:

An accident that came near proving fatal occurred at the Lost Camp Mines, about two miles from this place, on the afternoon of the 16th. Millie Cohan, aged about ten years, and daughter of George M. Cohan, general manager of all the mines in and about Lost Camp was assisting her younger sisters over the sluice boxes, in the mine known as the Wood's Ravine, when she missed her footing and fell into the boxes, through which was running at the time about five hundred inches of water. She was swept for a distance of sixteen hundred feet through the sluices as though she had been a feather. It appears that she passed through the boxes in a sitting position, and during her terrible race tried repeatedly to rescue herself from what in ninety-nine cases out of one hundred would have proved fatal to the strongest man. Even while going at the rate of a railroad train the girl exhibited presence of mind enough to let her head fall back into the water, to escape a piece of wood that was nailed over the boxes, and against which, but for the precaution taken, her brains would certainly have been dashed out. After being carried a distance of nine hundred feet she was washed over a “dump,” twelve feet high, falling into another sluice box, seven hundred feet long. Passing through the latter she was swept over another “dump,” twenty feet high, falling among rough, jagged rocks. Here she managed to crawl out a few feet from under the heavy body of falling water, and was shortly after rescued by Mr. Bartlett, foreman of the mine. It was found that she sustained severe injuries on the left knee, hip and side. Her face was also scratched and swelled, but fortunately neither will permanently disfigure her. At present she is improving rapidly, and it is hoped she will entirely recover from her injuries. Her escape from a terrible death is considered by those who understand the peril through which she has passed as something miraculous.

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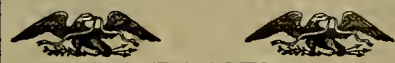
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dial agent. Eucalyptus and its preparations have been
found useful in obstinate cases of Intermittent and Marsh
Fever, often supplanting the use of Quinine. The
paroxysms of Asthma and Catarrh are greatly controlled,
and in various Kidney diseases and Catarrh of the Bladder
it seems to act like a specific.

FLUID EXTRACT EUCALYPTUS.

This extract represents in a concentrated form the
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THE ELIXIR OF EUCALYPTUS.

This compound presents the properties of the leaves
in a palatable form and elegant appearance. Dose—
One tablespoonful, to be repeated as often as the case
demands.

Cigarettes of Eucalyptus Globulus, useful in
Asthma, Difficulty of Breathing, Incipient Pleurisy, etc.
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Chemists and Apothecaries,

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Betts's name is on every Capsule he makes for the principal mer-

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there enabling vendor, purchaser, and consumer not only to

identify the genuineness of the capsule, but likewise the

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dle Bits, Pole Crabs, Hub Bands, Dash Ralls, and all ar-

ticles of household hardware plated at short notice, and

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We purchase Ores, Bullion, etc. Ores worked and
Taste made with care. Also, Assays of Gold, Silver,
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Having been engaged in furnishing these supplies since

the first discovery of mines on the Pacific Coast.

Our Gold and Silver Tables, showing the value

per ounce Troy at different degrees of fineness, and val-

uable tables for computation of assays in Grains

Grammes, will be sent free upon application.

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Important to Miners and Mill Men.

Silver-Plated Copper Amalgamating Plates,

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Of all size and in any quantity, furnished to

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Varney's Patent Amalgamator.

These Machines Stand Unrivaled.

For rapidly pulverizing and amalgamating ores, they

have no equal. No effort has been, or will be spared

to have them constructed in the most perfect manner

and of the great number now in operation, not one has

ever required repairs. The constant and increasing de-

mand for them is sufficient evidence of their merit.

They are constructed so as to apply steam directly

into the pulp, or with steam bottom, as desired.

The Comstock Mines.

The Latest Items—By our Resident Correspondent.

The past week has been a lively one on the Comstock. The gradual unloosening of purse strings by capitalists controlling the financial interests of this coast, in San Francisco, is having the long looked for salutary effect, renewing the confidence of that capricious element, the public, in the stability and permanency of our mines.

Scientists and practical miners know that the work of the past ten years is only the beginning of prospecting on this vast mineral section, and although the failure to produce new developments of importance in any mine last spring, the withdrawal of capital from mines and stock operations following the never to be forgotten crash of a year ago, the long months of despondency, hard work and repeated assessments levied had produced a depression and lack of general confidence equalled only by the verdict of 1865, that the 'bottom had fallen out,' that the Comstock was destined to be henceforth, a failure,—in the face of the enormous collection of assessments and the energetic continuation of exploration by men of nerve and patience who 'never say die.' We know that each day's labor has brought us 3 to 5 feet nearer our destiny,—the satisfaction of establishing our reputation as miners and convincing the world that the Comstock is the autocat of richness and energy.

The Past Year's Work

Shows conclusively that this lode has resources heretofore unlooked for, or even dreamed of. The general impression among the best informed mining men is that Chollar, Hale & Norcross, Savage, Gould & Curry, Con. Virginia and Ophir, can open rich and extensive bodies of ore at pleasure, and adjoining and intervening claims will of course reap the benefit of the results shown by the work of their more energetic neighbors.

The Chollar,

On their 800 feet, near the Hale and Norcross line is outting west through a wall of clay for the purpose of developing the body of ore from which the Norcross has been extracting their milling ore for the past few months near their south line, but which, for some mysterious reason, no effort has heretofore been made on the part of the Chollar Company to develop.

The Savage,

On their 1,700 feet level, is known to have a rich body of ore south of their incline, which, despite the efforts of the management to avoid developing until their "head centre" gives permission, has been cut into at several different points, giving evidence of a deposit of exceeding richness. A good evidence of this fact is that *insiders* being caught out, are doing their best to hear it, but from what is already known, it will not be likely to recede materially below present prices, and before the season is over is bound to take the lead.

The Supt. of Gould and Curry says there is nothing in it. There may be nothing in sight, but wait a little, and we shall see.

Consolidated Virginia

Is driving north to make connection with their main shaft, which is now some 870 feet down, and will connect with their 1,167-foot drift from Gould & Curry in about three months. They will then open up a very extensive body of ore, the value of which can now only be surmised.

It has been the fortune of

Ophir

In the past eight months to find what had been looked for, for seven years previously, in that mine—quartz. Extensive bodies of quartz have been found on all their levels, and although atreacks have repeatedly been found assaying largely, the general average has not been of sufficient value to warrant extracting for milling purposes. They are now sinking a permanent shaft from their 1,500-foot level, 400 feet east of main shaft, from which the ledge will be cut at intervals of 100 feet.

Sierra Nevada

Is slow. They are paying expenses from surface workings, but are not very energetic in deep prospecting. Their shaft showed streaks of quartz which raised their hopes some weeks ago, but thus far these indications amount to little.

This company, before developing anything of value, will find it necessary to sink a new shaft 1000 or 1500 feet east of their present one, when they will probably find a mine as rich as anybodys'.

The Empire and Imperial

Is the key to all the Gold Hill mines north of the Yellow Jacket.

At going rates, the Imperial and Empire mines are cheap for investment with a pound of ore in either mine, as being 1700 feet in depth and on the level of the proposed Suro Tunnel, and of the mines in this section developing a body of ore, will be compelled to pay tribute to this shaft. The machinery is perfect in every respect, and of sufficient power

to work and drain all these mines to a depth of 1000 feet lower than the present level.

The Imperial has a good showing on their south mine, being the same body of ore lately found in Confidence.

Yellow Jacket

Found some ore last week on their 1400 feet level, (south,) which assays about \$30.

The stock is held strong at present prices in consequence of this strike, and also the fine body of ore exposed in Confidence near their north line.

There is nothing being done in Kentucky, but the body of ore on the 1,800 foot level of Crown Point, pitching north, promises well for the future of this mine.

Belcher and Crown Point.

The question is often asked, why Belcher is not as good an investment as Crown Point. The simplest answer, in comparison, that could be given to this question, is, take an egg and cut off two-thirds from the larger end, for Crown Point, and give the remainder to Belcher, and the problem is solved.

The 1,300 foot level, Crown Point looks unusually well. After passing through a horse of 25 feet on the 3d and 5th floors, going east, they have exposed a fine body of ore, now 12 to 15 feet wide, assaying thus far from \$100 per ton, the eastern side of which is not yet reached. The 1,400 foot level has a two compartment drift, south from shaft 150 ft.

They are boring east into the ledge, for the purpose of draining gradually whatever water the ledge may contain between this level and the 1300.

Every indication thus far favors a more extensive body of ore on the 1400 ft. level in this mine than has heretofore been found.

Belcher is taking out its usual number of tons of ore daily through Yellow Jacket and its own shaft.

Segregated Belcher, as usual, is idle, waiting on its neighbors for future action.

Overman and Justice.

West drift from new shaft on the 1000 ft. level of Overman continues in porphyry without change. They have about 1500 ft. further to run to catch the Baltimore Consolidated ledge, which is on the line of their old mine.

Next following the Overman on the line of Comstock mines comes Justice. There is nothing to report from their main works, but from their south works—the old Waller's Defeat Shaft—adjoining Silver Hill on the north they are extracting ore which pays about \$40 per ton.

A mine called the Woodville, about 200 ft. directly east of the Waller's Defeat Shaft is taking out ore of the same character as that of the Justice which also pays about \$40 per ton.

Next south is a

Mill of Ground

Running from this point to Devil's Gate, covered by numerous claims of early days, which have all been absorbed, and consolidated under the name of

Silver Hill.

Their works are situated about 800 feet from their north line. At a depth of 160 feet they drifted direct west 200 feet, outting the vein. Running north and south from this point of intersection 400 feet each way, two chimneys of ore were uncovered. In cross-cutting on the north chimney it has been found to be 20 feet in width, and of great value, five feet of which exceeds in richness anything heretofore found on the Comstock, and resembles the old Gold Hill surface ore, which was worked by rockers for gold in '59 and '60.

CANA.

Virginia, May 13th, 1873.

The Eureka *Sentinel* hears notes of preparation for a forthcoming mining suit, which is to throw in the shade the Raymond & Ely-Hermes fight. The Eureka Consolidated and Richmond Consolidated, of Eureka, are rolling up their sleeves for a struggle in the Courts, which is to shake that young city into an agony of suspense. The *Sentinel* advises the combatants to compromise.

AN APPRECIATIVE SUBSCRIBER in Plumas County sends us ten dollars for the SCIENTIFIC PRESS. It is not often that we are greeted with that amount on a single subscription.

PROSPECTORS are exploring the country west of Highland District between that place and Bristol. As rich rock has been found thereabouts, favorable developments are expected.

Mr. Brown has put a party of prospectors to work to test the character of the coal vein on his property near Lafayette, Contra Costa county, where the outcrop is thought by experts to indicate a valuable deposit of excellent coal.

The Utah Central Railroad has shipped, during the past month, 2,680,000 pounds of ore, 660,000 pounds of bullion, and 660,000 pounds of lead.

THE BLACK SAND MINE, formerly owned by the Cox Brothers, near Port Orford, Oregon, has been lately sold to a company residing on Coos Bay.

ASA W. RAWSON will please communicate with this office.

CONTINENTAL LIFE INSURANCE CO., No. 302 Montgomery street, corner of Pine,

Gravel Mining Development.

Messrs. Yule and Clough, of San Francisco, visited our section of country last week, for the purpose of examining the extensive gravel claim owned by N. Gilmore and Thomas Stapleton near Diamond Springs. Mr. Yule, than whom there is no better informed gravel miner in California, nor any who have had larger practical experience, made a thorough and critical examination of the mine above mentioned, making numerous tests of the gravel, taken by himself from several points remote from each other, examined the facilities for increase of water supply, increase of pressure and of improvement in convenience for dumpage, and as a result of all the investigations by himself and partner—Mr. Clough—they concluded to bond the mine with a view to putting it immediately on the English market, where these gentlemen have enviable connections and we are assured that there is hardly any room to doubt the early consummation of arrangements for the systematic and thorough development of the mine. This, if anticipations are realized, will lead to the introduction of a considerable amount of foreign capital, and we are sanguine that the results of this enterprise will lead to many similar investments in our vicinity.

As a rule, English investments in gravel mining have been much more remunerative of late than those made in quartz properties; which has in that quarter stimulated inquiry for and an inclination to invest in gravel mines. It is familiar to most of our readers that there are hundreds and hundreds of acres of gravel claims in this county, none of which are one whit less richly charged with gold than is this Gilmore and Stapleton mine, and yet Messrs. Yule and Clough, both old Californians and experienced miners, were greatly astonished at the indubitable richness and value of the latter, when coupled with the fact of its non-development at this late day. But it must be remembered that the failure to develop in this and many similar cases has not been due to ignorance or uncertainty, about the richness of the deposits. That these are incomparably richer than the gravel ranges of Dutch Flat, Gold Run and other districts that have been worked with surprising profit, has been long and well known and not open to successful controversy. But adequate supplies and sufficient pressure of water, and proper facilities for dumpage were only to be obtained by an expenditure at which local capital hesitated, with ten and twelve per cent. as the minimum rate of interest for money, which is grudgingly doled out at those or even at somewhat higher rates.

The transaction under consideration looks also to the purchase and enlargement of the ditch; the conveyance of water in iron pipes a sufficient distance to insure a heavy pressure, and tunneling operations that will secure ample dumpage. These preliminaries will cost a considerable amount of money, but the investment will be richly remunerative beyond a peradventure. We are not at all addicted to optimism, but we feel confident that the consummation of this or any other single project of the kind will lead to results that will agreeably astonish its most sanguine projectors, and will lead to an excited scramble for and the rapid development of other locations on the vast gravel deposits of our vicinity. With little of local prejudice and no fear of successful contradiction, we fearlessly express the opinion that the gravel range of this section is the most inviting and the safest field for mining investment to be found on the Pacific Coast. One experiment will satisfy the outside world as to the correctness of this opinion. We doubt whether it is possible to find a better location for trying this experiment than on the property above referred to and by the means above suggested.—*Placerville Democrat*.

The man who went into the woods alone to die, says, after enumerating the symptoms of Catarrh: "Death is at any times preferable to such feelings. Bones came out of my nostrils in November. In January, 1872, lost all sense of smell, and the odor arising from my disease became so offensive that no one would stay near me. Did not care now want to eat at the table with others. Often wished I was dead. Last summer about twenty pieces of bones came out of my head, some pieces being 1 1/2 inches in length. Commenced taking Dr. Evory's Diamond Catarrh Remedy October 31st, 1872. I have now regained my sense of smell, the mucous membrane is healed, the offensive odor has left me, and I have now regained my health and have gone to work, as I consider myself cured. I have suffered death in life. You that have the disease slightly, do not neglect it when a few bottles of this remedy will cure you. You can't wear it out. Seven years ago there was not a healthier or more rugged man in the State, but Catarrh nearly killed me. As a man of principle, I have told you the truth and given you warning."

I am the man that went into the woods alone to die, but did not, for Dr. Evory's Diamond Catarrh Remedy cured me. My name is Peter M. S. Sphers, of Jackson, Amador county, Cal., and am well and favorably known in this country since '49.—Extract from a letter which can be seen at Dr. Evory & Co.'s office, 9 Post st., S. F.

Try Dr. Evory's Diamond Catarrh Remedy. Only 50 Cents.

Says John to Nance, you look so bright, Your eyes they sparkle, like a star. Oh! yes, says Nance, Dr. Evory's remedy Has cured that horrid, bad catarrh.

OUT OF THE FOG AT LAST.—Dr. Evory has discovered the only sure cure for Catarrh and Colds. One bottle gives immediate relief, and a few bottles effect a cure. All we ask is a trial. If your druggist don't have it, send to Dr. A. F. Evory & Co., 9 Post street, S. F. It only costs 50 cts. 14726-3m

WE WILL CHANGE THE ADDRESS FREE for any subscriber who notifies us in writing of his new address, with the OLD P. O. address to enable us to find his name among thousands of others.

THE SIX FOLLIES OF SCIENCE.—The six follies of science are said to be the following: The quadrature of the circle, the establishment of perpetual motion, the philosopher's stone, of the transmutation of metals; divination, or the discovery of secrets by magic, and lastly judicial astrology. It is unwise to say that anything is impossible until the impossibility is demonstrated. It is not at all improbable that the present century may see that one of these so-called follies is a reality.—*Atlas*.

GENERAL MERCHANDISE.

BAGS		PAINTS	
Eng. stand. Whit	1 1/2 @ 15	Atlan. W. lead.	1 1/2 @ 12
Flour Sacks	13 @ 15	Whitening	1 @ 1
Stand. Gunnies	17 @ 17 1/2	Chalk	1 @ 1
Barley do.	16 @ 12	Paris White	1 @ 3
Barley do.	16 @ 12	White Lead	1 @ 3
Barley do.	16 @ 12	Venician Red	1 @ 3
Barley do.	16 @ 12	Red Lead	1 @ 11
Barley do.	16 @ 12	Litharge	1 @ 11
CANNED GOODS.		RICE	
Ass't Pie Fruits	3 @ 30	China No. 1	7 1/2 @ 7 1/2
Ass't Pie Fruits	3 @ 30	do 2	7 1/2 @ 7 1/2
Ass't Pie Fruits	3 @ 30	do 3	7 1/2 @ 7 1/2
Ass't Pie Fruits	3 @ 30	do 4	7 1/2 @ 7 1/2
Ass't Pie Fruits	3 @ 30	do 5	7 1/2 @ 7 1/2
Ass't Pie Fruits	3 @ 30	do 6	7 1/2 @ 7 1/2
Ass't Pie Fruits	3 @ 30	do 7	7 1/2 @ 7 1/2
Ass't Pie Fruits	3 @ 30	do 8	7 1/2 @ 7 1/2
Ass't Pie Fruits	3 @ 30	do 9	7 1/2 @ 7 1/2
Ass't Pie Fruits	3 @ 30	do 10	7 1/2 @ 7 1/2
Ass't Pie Fruits	3 @ 30	do 11	7 1/2 @ 7 1/2
Ass't Pie Fruits	3 @ 30	do 12	7 1/2 @ 7 1/2
Ass't Pie Fruits	3 @ 30	do 13	7 1/2 @ 7 1/2
Ass't Pie Fruits	3 @ 30	do 14	7 1/2 @ 7 1/2
Ass't Pie Fruits	3 @ 30	do 15	7 1/2 @ 7 1/2
Ass't Pie Fruits	3 @ 30	do 16	7 1/2 @ 7 1/2
Ass't Pie Fruits	3 @ 30	do 17	7 1/2 @ 7 1/2
Ass't Pie Fruits	3 @ 30	do 18	7 1/2 @ 7 1/2
Ass't Pie Fruits	3 @ 30	do 19	7 1/2 @ 7 1/2
Ass't Pie Fruits	3 @ 30	do 20	7 1/2 @ 7 1/2
Ass't Pie Fruits	3 @ 30	do 21	7 1/2 @ 7 1/2
Ass't Pie Fruits	3 @ 30	do 22	7 1/2 @ 7 1/2
Ass't Pie Fruits	3 @ 30	do 23	7 1/2 @ 7 1/2
Ass't Pie Fruits	3 @ 30	do 24	7 1/2 @ 7 1/2
Ass't Pie Fruits	3 @ 30	do 25	7 1/2 @ 7 1/2
Ass't Pie Fruits	3 @ 30	do 26	7 1/2 @ 7 1/2
Ass't Pie Fruits	3 @ 30	do 27	7 1/2 @ 7 1/2
Ass't Pie Fruits	3 @ 30	do 28	7 1/2 @ 7 1/2
Ass't Pie Fruits	3 @ 30	do 29	7 1/2 @ 7 1/2
Ass't Pie Fruits	3 @ 30	do 30	7 1/2 @ 7 1/2
Ass't Pie Fruits	3 @ 30	do 31	7 1/2 @ 7 1/2
Ass't Pie Fruits	3 @ 30	do 32	7 1/2 @ 7 1/2
Ass't Pie Fruits	3 @ 30	do 33	7 1/2 @ 7 1/2
Ass't Pie Fruits	3 @ 30	do 34	7 1/2 @ 7 1/2
Ass't Pie Fruits	3 @ 30	do 35	7 1/2 @ 7 1/2
Ass't Pie Fruits	3 @ 30	do 36	7 1/2 @ 7 1/2
Ass't Pie Fruits	3 @ 30	do 37	7 1/2 @ 7 1/2
Ass't Pie Fruits	3 @ 30	do 38	7 1/2 @ 7 1/2
Ass't Pie Fruits	3 @ 30	do 39	7 1/2 @ 7 1/2
Ass't Pie Fruits	3 @ 30	do 40	7 1/2 @ 7 1/2
Ass't Pie Fruits	3 @ 30	do 41	7 1/2 @ 7 1/2
Ass't Pie Fruits	3 @ 30	do 42	7 1/2 @ 7 1/2
Ass't Pie Fruits	3 @ 30	do 43	7 1/2 @ 7 1/2
Ass't Pie Fruits	3 @ 30	do 44	7 1/2 @ 7 1/2
Ass't Pie Fruits	3 @ 30	do 45	7 1/2 @ 7 1/2
Ass't Pie Fruits	3 @ 30	do 46	7 1/2 @ 7 1/2
Ass't Pie Fruits	3 @ 30	do 47	7 1/2 @ 7 1/2
Ass't Pie Fruits	3 @ 30	do 48	7 1/2 @ 7 1/2
Ass't Pie Fruits	3 @ 30	do 49	7 1/2 @ 7 1/2
Ass't Pie Fruits	3 @ 30	do 50	7 1/2 @ 7 1/2
Ass't Pie Fruits	3 @ 30	do 51	7 1/2 @ 7 1/2
Ass't Pie Fruits	3 @ 30	do 52	7 1/2 @ 7 1/2
Ass't Pie Fruits	3 @ 30	do 53	7 1/2 @ 7 1/2
Ass't Pie Fruits	3 @ 30	do 54	7 1/2 @ 7 1/2
Ass't Pie Fruits	3 @ 30	do 55	7 1/2 @ 7 1/2
Ass't Pie Fruits	3 @ 30	do 56	7 1/2 @ 7 1/2
Ass't Pie Fruits	3 @ 30	do 57	7 1/2 @ 7 1/2
Ass't Pie Fruits	3 @ 30	do 58	7 1/2 @ 7 1/2
Ass't Pie Fruits	3 @ 30	do 59	7 1/2 @ 7 1/2
Ass't Pie Fruits	3 @ 30	do 60	7 1/2 @ 7 1/2
Ass't Pie Fruits	3 @ 30	do 61	7 1/2 @ 7 1/2
Ass't Pie Fruits	3 @ 30	do 62	7 1/2 @ 7 1/2
Ass't Pie Fruits	3 @ 30	do 63	7 1/2 @ 7 1/2
Ass't Pie Fruits	3 @ 30	do 64	7 1/2 @ 7 1/2
Ass't Pie Fruits	3 @ 30	do 65	7 1/2 @ 7 1/2
Ass't Pie Fruits	3 @ 30	do 66	7 1/2 @ 7 1/2
Ass't Pie Fruits	3 @ 30	do 67	7 1/2 @ 7 1/2
Ass't Pie Fruits	3 @ 30	do 68	7 1/2 @ 7 1/2
Ass't Pie Fruits	3 @ 30	do 69	7 1/2 @ 7 1/2
Ass't Pie Fruits	3 @ 30	do 70	7 1/2 @ 7 1/2
Ass't Pie Fruits	3 @ 30	do 71	7 1/2 @ 7 1/2
Ass't Pie Fruits	3 @ 30	do 72	7 1/2 @ 7 1/2
Ass't Pie Fruits	3 @ 30	do 73	7 1/2 @ 7 1/2
Ass't Pie Fruits	3 @ 30	do 74	7 1/2 @ 7 1/2
Ass't Pie Fruits	3 @ 30	do 75	7 1/2 @ 7 1/2
Ass't Pie Fruits	3 @ 30	do 76	7 1/2 @ 7 1/2
Ass't Pie Fruits	3 @ 30	do 77	7 1/2 @ 7 1/2
Ass't Pie Fruits	3 @ 30	do 78	7 1/2 @ 7 1/2
Ass't Pie Fruits	3 @ 30	do 79	7 1/2 @ 7 1/2
Ass't Pie Fruits	3 @ 30	do 80	7 1/2 @ 7 1/2
Ass't Pie Fruits	3 @ 30	do 81	7 1/2 @ 7 1/2
Ass't Pie Fruits	3 @ 30	do 82	7 1/2 @ 7 1/2
Ass't Pie Fruits	3 @ 30	do 83	7 1/2 @ 7 1/2
Ass't Pie Fruits	3 @ 30	do 84	7 1/2 @ 7 1/2
Ass't Pie Fruits	3 @ 30	do 85	7 1/2 @ 7 1/2
Ass't Pie Fruits	3 @ 30	do 86	7 1/2 @ 7 1/2
Ass't Pie Fruits	3 @ 30	do 87	7 1/2 @ 7 1/2
Ass't Pie Fruits	3 @ 30	do 88	7 1/2 @ 7 1/2
Ass't Pie Fruits	3 @ 30	do 89	7 1/2 @ 7 1/2
Ass't Pie Fruits	3 @ 30	do 90	7 1/2 @ 7 1/2
Ass't Pie Fruits	3 @ 30	do 91	7 1/2 @ 7 1/2
Ass't Pie Fruits	3 @ 30	do 92	7 1/2 @ 7 1/2
Ass't Pie Fruits	3 @ 30	do 93	7 1/2 @ 7 1/2
Ass't Pie Fruits	3 @ 30	do 94	7 1/2 @ 7 1/2
Ass't Pie Fruits	3 @ 30	do 95	7 1/2 @ 7 1/2
Ass't Pie Fruits	3 @ 30	do 96	7 1/2 @ 7 1/2
Ass't Pie Fruits	3 @ 30	do 97	7 1/2 @ 7 1/2
Ass't Pie Fruits	3 @ 30	do 98	7 1/2 @ 7 1/2
Ass't Pie Fruits	3 @ 30	do 99	7 1/2 @ 7 1/2
Ass't Pie Fruits	3 @ 30	do 100	7 1/2 @ 7 1/2

Leather Market Report.

[Reported for the PRESS by DOLLIVER & BRO.]	
SAN FRANCISCO, Wednesday, May 14, 1873.	
The market for Sole Leather continues the same. French Calf steady at old prices, with light demand.	
Calf Tanned Leather, #1	26 @ 29
Calf Tanned Leather, #2	26 @ 29
Calf Tanned Leather, #3	26 @ 29
Calf Tanned Leather, #4	26 @ 29
Calf Tanned Leather, #5	26 @ 29
Calf Tanned Leather, #6	26 @ 29
Calf Tanned Leather, #7	26 @ 29
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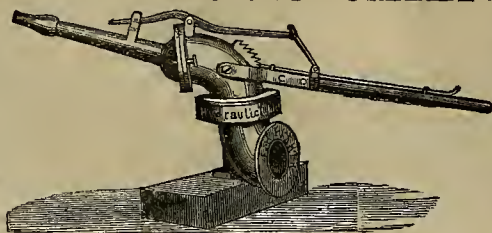
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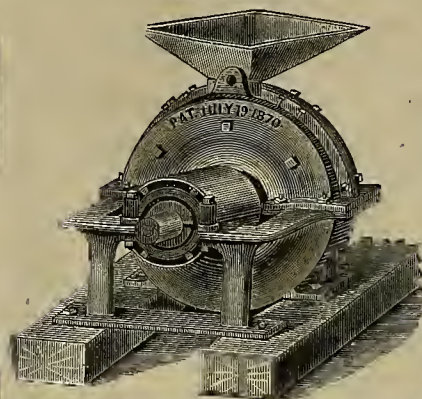
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TO ORDER,
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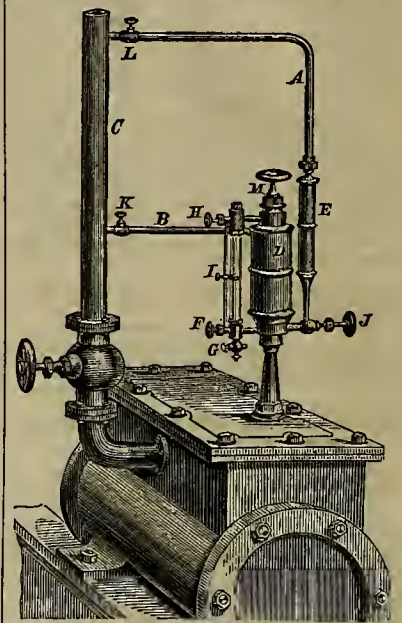
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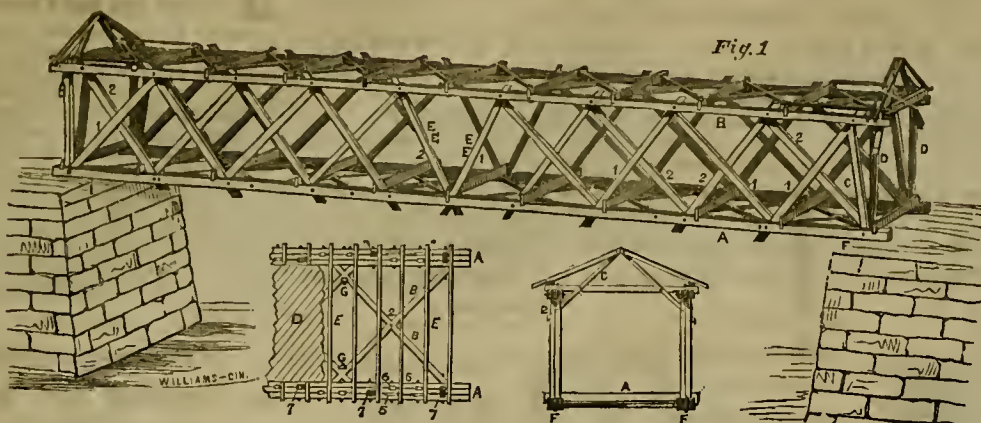
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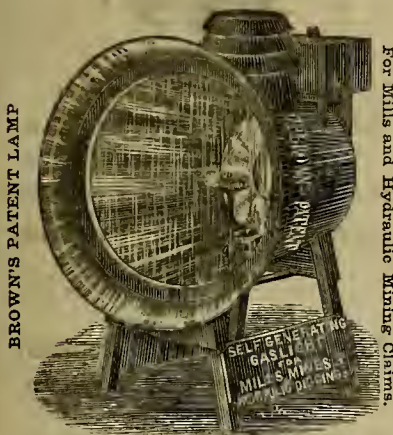
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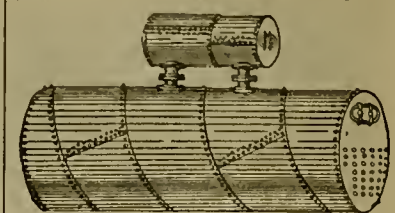
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C. P. R. R.

COMMENCING

Sunday, May 4th, 1873.

And until further notice, Trains and Boats will

LEAVE SAN FRANCISCO.

7.00 A. M. (Daily). Atlantic Express Train (via Oakland) for Sacramento, Marysville, Redding, and Portland. Co. Colfax, Reno, Ogden and Omaha.

7.30 A. M. (Daily). Cal. P. R. R. Steamer (from Broadway Wharf)—Connecting at Vallejo with Trains for Callista, Knight's Landing and Sacramento; making close connection at Napa with stages for Sonoma.

2.00 P. M. (Sundays excepted). Stockton Steamer (from Broadway Wharf), touching at Vallejo, Benicia, and Landings on the San Joaquin river.

3.00 P. M. (Daily). San Jose Passenger Train (via Oakland), stopping at all way Stations.

4.00 P. M. (Sundays excepted). Passenger Train (via Oakland) for Lathrop, Merced, Visalia, Tipton, and Los Angeles, Stockton and Sacramento.

4.00 P. M. (Sundays excepted). Cal. P. R. R. Steamer (from Broadway Wharf) connecting at Vallejo with Trains for Callista, Knight's Landing and Sacramento.

4.00 P. M. (Sundays excepted). Sacramento Steamer Landings on the Sacramento river.

6.30 P. M. (Daily). Overland Emigrant Train (via Oakland)—Through Freight and Accommodation.

OAKLAND BRANCH.—LEAVE SAN FRANCISCO, 7.00, 8.00, 9.00, 10.10 and 11.20 a. m., 12.10, 1.30, 3.00, 4.00, 5.15, 6.30, 8.15, 9.20 and 11.30 p. m. (9.20, 11.20 and 3.00 to Oakland only).

LEAVE BROOKLYN (for San Francisco), 5.30, 6.40, 7.50, 9.00 and 11.00 a. m., 1.30, 2.40, 4.55, 6.10, 7.55 and 10.10 p. m.

LEAVE OAKLAND, 5.40, 6.50, 8.00, 9.10, 10.00, and 11.10 a. m., 12.01, 1.30, 2.50, 5.05, 6.20, 8.05 and 10.20 p. m.

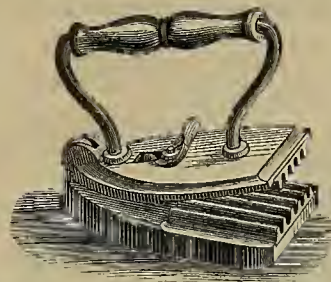
ALAMEDA BRANCH.—LEAVE SAN FRANCISCO, 7.20, 9.00 and 11.15 a. m., 1.30, 4.00, 5.30, and 7.00 p. m. (7.20, 11.15 and 5.30 to Fruitvale only).

LEAVE HAYWARD (for San Francisco), 4.30, 7.00 and 10.45 a. m., and 3.30 p. m.

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EUREKA, Nevada, July 10, 1872.
T. M. MARTIN My dear sir: On your leaving for San Francisco, it gives me great pleasure to hand you my written acceptance of the HALLIDIE TRAMWAY put up by you upon our mine in Freilburg.

It is a perfect success, discharging ten tons of ore per hour with two men's labor. It is perfectly simple in construction, and, as far as I can judge, there is nothing about it to ever get out of order—nothing to wear out. While ours requires but about two thousand five hundred feet of wire rope, I can see no reason why the line could not be extended almost indefinitely with equally happy results. Again, the carrying capacity might be doubled or quadrupled if desired. After several weeks trial upon our mine, the unanimous verdict of all who have seen it is a complete, unquestioned success. If this can be of any service to you, use it in any way you think proper. Very respectfully, O. C. GOODWIN.

EMMA HILL CONSOLIDATED MINING CO.,

Little Cottonwood, Utah,

Superintendent's Office, Sept. 23, 1872.

T. M. MARTIN, Esq., Sir: The Ropeway constructed by you HALLIDIE'S PATENT for the Emma Hill Consolidated Mining Company, has been built in a most substantial and workmanlike manner, and is at this time in splendid working condition. I most cheerfully accept the work for the Company, and recommend it to others wishing a sure and speedy transit for ores over places impracticable for wagon roads, etc. Respectfully,

L. W. COLBATH, Superintendent.

"The Vallejo works smoothly with the elevated wire tramway, which carries its load as quietly and easily as there was no winter or snow in the world."
"Whatever the objections to wire tramways may be on account of their cost, I have seen nothing yet that even approaches them in the facilities they afford for moving ore at all seasons of the year."—Correspondent Utah Mining Journal, Alta, Jan. 8, 1873.

The Vallejo Ropeway.

The Vallejo Tunnel Company's Tramway in Little Cottonwood, built on the HALLIDIE PATENTED PLAN, is a complete success. It is between 2,300 and 2,400 feet in length, and is supported by thirteen stations. The fall in this distance is about 800 feet, and the wire rope, which is three-fourths of an inch in diameter, will safely and easily deliver one hundred tons in six hours. The machinery is automatic, loading and unloading the ore, and the tramway can be worked all winter long, without the slightest trouble.—Utah Mining Journal, Salt Lake, Sept. 23, 1872.
Mining Companies and others desiring to negotiate for the erection of this system of Ropeway, can communicate with me personally, or through Postoffice Box 964.

A. S. HALLIDIE, Patentee,

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VOLUME XXVI.
Number 21.

THE EMPIRE STATE 16 stamp mill in Seven Mile Cañon, Washoe, after being thoroughly overhauled has started up again.

CORRESPONDENCE.

The Vienna Exposition.

[FROM OUR SPECIAL CORRESPONDENT—GUIDO KUSFEL.]

Easter is over. The celebration of these holy days in the Austrian Empire shows now a different character, compared with that of twenty years ago. The comfortable patriarchal celebration in squandering the precious time of several successive holy days, gave way to a practical life, devoted to industry and the promotion of national prosperity. Austria is not what she was six years ago, and foreign newspaper articles about Austrian affairs, written still from the old point of view, generally concluding with "rotten empire, bankruptcy, dissolution," etc., are phrases not applicable to the present condition. Her former policy was outside the Austrian boundary, in Germany; the home policy was a secondary matter; getting money and keeping down all signs of political life. The year 1866 destroyed the Austrian influence in Germany, and the events, the tyrannical system in Austria. She has now a constitutional government, and a free press full of independent, fearless political articles. The internal political differences, as yet in the diet and chamber of deputies are unavoidable. The fact, that the school books of the empire are printed in not less than nineteen different languages may prove that the interest of different public affairs must be divided more than in any other State, and it may require several years more, before by a skillful regulation of affairs some kind of harmony is effected. But those national conflicts, considered to be critical or dangerous to the existence of the double empire, strange as it seems, did not interfere with the social and industrial development of this people; to the contrary, the general prosperity increased during and with the political troubles. It is surprising to notice, with what energy the advantages of modern science are taken hold of by all nations of the empire, and although only a very short time of political freedom has yet been enjoyed, the present World's Exposition will demonstrate the industrial progress of Austria.

In spite of all exertion, it is impossible to be ready with the Exposition by the first of May. In this respect Vienna has to share the fate of all former expositions. Probably not one of the States will be quite ready at this opening ceremony, for which this rotunda will be fixed up as much as possible. Neither the Japanese nor Chinese, Turks, Egyptians, or anybody else will be through with their respective outside buildings except with some smaller affairs. The German exhibitors seem to be ahead of all others in the palaces as well as in the machinery hall; some splendid German locomotives are already fixed up. This putting up of English machinery is not so far progressed as the German, but they are hard at work in fixing the foundation for engines, etc. Of the American, nothing is to be seen yet, but is expected here to-day or to-morrow. The yard between this gallery, belonging to the United States is nicely covered, admitting sufficient light, and will be finished in a few days. With the many additional exposition buildings, national houses, villas, etc., the exhibition region looks like a town, and it is the last place in the world to "meet you there," unless time and exact plans are agreed upon. The proprietors of the "Neue Freie Presse" erected a splendid building opposite the front of the palace for their newspaper, to be printed there during this exposition.

The monument of King Max I., on which Professor Zumbusch has been at work for the last five years, will be sent from Munich to this exposition here. It is forty-five feet high. It will be the largest piece of German monumental sculpture. Two other notable monuments come from Switzerland; one is the St. Jakob's monument, the other the National monument from Geneva. In the machinery hall, Switzerland is represented by over sixty non-working, and as many machines in operation.

The German telegraph administration will make an exposition in the telegraphic line. The respective objects are ready for shipment. Also products of factories will be exhibited, necessary for telegraphic supply. A Portuguese school house is also added to the others, occupying an area of 63x29½ feet. Belgium has in the machinery hall 32,274 square feet, in the palace, 28,110, in the rotunda, 2,151½, in the palace of arts, 6,451, in the additional department, 1,032½, in the hall of agriculture, 3,765, and a large pavilion of 1,075½ square feet for the exhibition of her art. Turkey puts up a relief plan of the Bosphorus, 46 feet long and 13 feet wide. There is also an iron pavilion in the Turkish yard to receive the Sultan's treasure; the pavilion is 20 feet high. A most remarkable work of art is the stenographic "Iliad" of Mr. Scriber, Professor of Stenography at the Vienna University. All single pages, put together by each other's side, do not amount to half a printing sheet. One page of this work is about a two thousandths part of an ordinary newspaper sheet. It contains 800 pages, and can be placed in a nutshell. The high side of the fountain's basin in the center of the rotunda, at which fifty men

have been employed for a whole month, has been finished just now.

General Van Buren has arrived here, also Professor W. Blake, Col. L. Bridges (in connection with the American school house), John P. Jackson of the New York *Herald*, Mr. Hettman of the New York *Tribune*, etc.

The Orient seems to be much better represented here than in the last Paris Exposition. This Oriental display is so extensive, that, being amongst those different buildings one forgets where he is. The great interest which the Orientals betray in the exhibition is significant, especially for Austrian commerce, which exists already between her and the East. Japan, China, Siam, Persia, Turkey, Egypt, Tunis, Morocco and Roumania are all included in the Oriental department. Greece is for itself, East India with England, but Abyssinia, Central Africa and European colonies in Asia are included in the Oriental department.

Vienna, April 18, 1873.

G. K.

Chips from the Comstock.

[By Our Virginia Correspondent.]

Stress of weather prevented writing last night. Night before last, Savage, in running south-east towards the Hale & Norcross line, again unintentionally cut into their body of ore on 1,700-ft. level. When they get ready to show up they will astonish the world.

Chollar suddenly stopped work on this clay east of their west body of ore—ostensibly—because their main drift had closed up. They are respiring drift and station, making new cars, and evidently preparing to take out ore as soon as the Supt. shall return from San Francisco, in about two weeks. It is believed, by those posted, that they cut through the clay above referred to before the Supt. went below, and found quartz assaying \$60 to \$400.

Baltimore Consolidated is quiet—doing nothing towards the development of their own grounds at present.

Their lower drift is still flooded, and disaffected stockholders will find it difficult to gain access to the body of ore said to have been found at this point, on Judge Rising's or anybody's else order—until it suits the management.

The only work being done here is a drift being run south on their upper level, on contract, towards the American Flat Mine.

CANA.

An Artesian Prospecting Shaft.

We yesterday visited the artesian prospecting shaft, says the *Virginia Enterprise*, which is being sunk by General Williams, Mr. Shultz, Superintendent of the Bullion mine, and others, in the eastern suburbs of this city, a short distance east of the works of the Virginia Gas Company. The company have made a regular mining location in

A Good Mineral Belt.

And their works are in line with a series of croppings which can be traced both northward and southward. Besides, they are in what may be called the flat country lying to the eastward of this great Comstock lode. The ground there being comparatively level, any mineral vein being found it would be likely to lie more regularly than do those on the steep mountain slopes, where they have been subjected to disruptions of various kinds. In short, the ground chosen seems in every respect favorable to the successful issue of the novel prospecting experiment now being tried.

The Boring Apparatus.

Boiler, engine and all, stands on four iron wheels, resembling car wheels, and is a model of compactness. Standing over, and, as it were, astride this machinery, are four posts about thirty-five feet in height. These posts are about twelve feet apart on the ground, and at the top are but three or four feet apart. Boards are nailed to the sides of these posts to the height of ten feet, a roof has been added, and thus is formed a house which incloses the whole of the machinery. The whole thing may be easily taken down and moved when a new hole is to be sunk. They are now at work upon their third hole, and for each new hole the apparatus has been moved a short distance. We yesterday had the satisfaction of witnessing

The Operation of Boring.

Also that of tubing the shaft, as we may call it, though it is a very small one. The boring is done by means of a diamond drill. The boring rod resembles sections of gas pipe, about ten feet in length, which screw together and thus form a rod of any desired length. The drill is but a plug of steel screwed fast to the end of one of these sections of pipe. In this plug are set the diamonds, six or eight in number, which do the cutting. The diamonds are of a dark brown color, and more resemble small pieces of iron ore than anything else. Small holes are out or drilled into the steel plug where they are to be set; they are then put in place and the edges of the steel awaged up tightly about them. The stones do not feel at all sharp, and one would hardly believe they would make any impression on hard granite or quartz rock. By the side of each diamond is drilled a small hole which extends through the plug and into the hollow of the rod. This is done in order that the water

which is forced in at the top of the hollow rod may flow out near the stone, and thus keep it clear of the small chips cut from the rock. The drill used does not produce a core, as do some of the diamond drills. It cuts or grinds all the rock it displaces in a fine powder. During the operation of boring, a strong current of water constantly flows down through the pipe and up on the outside, bringing up with it the borings. The drill makes several hundred revolutions per minute, and thus, despite the dullness of the diamonds, wears out the rock upon which it is operated. The holder in which the drill rod is placed is revolved by cog-gearing, and the feed is regulated by means of a screw cut upon this holder, the working of which we will not undertake to explain, though it is simple enough when seen.

The Reaming Out

Of the whole is done at the same time as the boring. The hole bored is about two inches in diameter, and this is reamed out till it is over three inches in diameter. It must be made this large to admit the tubing, which is three inches in diameter. At first sight it seems strange that a tool can be worked through a tube which will make a hole larger than the tube itself, but this is easily done. On one side of the drill rod is a projection, a sort of bulge, set with diamonds, and this works as an eccentric when it is let down below the tubing, scooping out the rocks on all sides. This is placed on the rod about eight feet above the small drill which goes ahead. Sections of the tubing are screwed on and pushed down as the work progresses. The drill makes very

Rapid Progress.

Boring into the rock at the rate of five feet per hour. It is the hoisting out of the rods and the putting in of the tube that consumes the most time; yet, on the whole, the amount of work done is astonishing. The hole on which they were at work yesterday was only begun the day previous, and yet at the time of our visit yesterday, about 3 o'clock in the afternoon, it had already been bored to the depth of forty-eight feet. Mr. Gore, who has charge of the apparatus, says he can easily sink thirty feet per day when all works well. This is good work considering that the hole made is three inches in diameter. The ground bored through can be tested all the way down by merely catching the dirt which is brought up by and flows out with the water. Good prospects have already been obtained in all the holes bored, but just how good the parties most interested do not care to make public. They are evidently making preparations for sinking

A Working Shaft.

As they are boring the holes in such a shape that they can be used for blasting out a shaft of four compartments of the size usually seen at our hoisting works. Once holes are sunk at all the corners, and a few at proper distances between, the shaft can be blasted out very rapidly. The machine used can be loaded upon a wagon and hauled about the country to any point where it is thought worth while to sink a hole in search of any kind of ore, stone, coal or any other valuable mineral deposit. It requires but very little water, and the labor of but three men, all told. This water used where they are now at work is brought through a small gas pipe from the works of the Gas Company. They are now cutting through a stratum of porphyry. Below this, strange as it may seem, is found about fifty feet of quicksand. This is what they say, but it must be a stratum of rock greatly decomposed. Their deepest hole is down 630 feet, yet no water was found in any of their borings. A visit to these works will repay any person who has never seen any work of this kind in progress.

Coal Measures in the United States.

The commissioner of the census gives in this third volume of the ninth census a map showing the geological formation of the surface of the United States. In connection with it he has written some interesting remarks, and a sketch descriptive of the coal measures in the United States, which, in a very short space, tells us where coal is found in different parts of the country, and the extent of each area of coal lands.

The following are the areas of the coal measures in the United States:

New England basin, in Massachusetts and Rhode Island, estimated to cover 750 square miles. The coal is a plumbaginous anthracite, used to advantage in some smelting furnaces. Perhaps eleven beds may exist; best seen in Portsmouth, Rhode Island. The maximum thickness is 23 ft. The whole carboniferous system is supposed to be 6,500 feet thick, of which 2,500 pertains exclusively to the coal measures.

Anthracite basins in Pennsylvania.—This is the most important coal district in the United States. There are four areas, having an area of 410 square miles, not including the Broad-Top semi-anthracite, which amounts to 24 more. The measures are from 2,000 to 3,000 feet thick. The number of distinct beds varies from two to twenty-five, according to the depth of the basin. The maximum amount near Pottsville is given at 207 feet, while the average cannot be far from 70 feet.—(H. D. Rogers.)

The *Appalachian field* embraces an area of 63,475 square miles, extending from Pennsylvania to Alabama.

In Pennsylvania the aggregate thickness of the measure is from 825 to 2,535 feet. The area of the bituminous coal is 12,222 square miles, with an average thickness of 40 feet of coal.—(H. D. Rogers.)

In Maryland the area is 550 square miles, in three separate basins. The strata are 1,500 feet thick. There are thirty-two beds in all—ones of 14 feet, three of 6 feet each; others from 1 to 5 feet thick.—(P. T. Tyson.)

In Virginia (chiefly West Virginia) the coal area embraces 10,000 square miles. On the Kanawha the strata are 1,250 feet thick, with twenty-four beds of coal, of which eleven have an aggregate of 51 feet thickness. The coals seem best developed on this river.—(S. T. Ridgway.)

In Ohio, Dr. J. S. Newberry states the area to be more than 10,000 square miles, with a thickness of 1,500 feet, and ten workable beds of coal, corresponding in number and thickness to those of Pennsylvania and West Virginia.

In Eastern Kentucky the area is stated to be 10,000 square miles.

In Tennessee, Professor J. M. Safford states the area of the measures to be 5,100 square miles. One characteristic section gives a thickness of 578 feet. There are seven beds of coal, with a total thickness of 14 feet. The beds vary locally in their dimensions, some of them being 9 feet thick, but thinning out very rapidly.

In Georgia the area may be represented by 170 square miles.

In Alabama a hasty measurement would indicate an area of 9,000 square miles.

The *Michigan basin* has an area of 6,700 square miles, with 122 feet of measures and 11 feet (maximum) of coal. In this center the coal is thickest, thinning out to nearly the thickness of paper around the edges.—(A. Winchell.)

The *Illinois basin*, including Indiana, and Western Kentucky, covers an area of 51,700 square miles.

In Illinois the measures occupy 41,500 square miles, from 600 to 2,500 feet thick, and contain ten beds of coal, with an aggregate thickness of 35 feet.—(A. H. Worthen.)

In Indiana the measures occupy an area of 6,500 square miles, are 650 feet thick, and contain thirteen beds of coal, with an aggregate thickness of 31 feet.—(E. T. Cox.)

In Western Kentucky the measures are 612 feet thick, including the millstone grit, and carry eleven beds of coal.—(E. T. Cox.)

The *Missouri basin* extends from Iowa to Texas.

In Iowa, Professor White's maps show an area of 25,000 square miles, which is divided into three parts, each about 200 feet thick. The two lower divisions contain the workable coal, which amounts to 8 feet in the second, but to only 20 inches in the upper. As the highest division is everywhere underlaid by the others, the whole area must be regarded as workable.

In Missouri, Professor G. C. Swallow estimates the coal area at 27,000 square miles, and in Kansas at 17,000 square miles. The measures are 2,000 feet thick, with twenty coal beds, from a few inches to 6 feet thick.

In Arkansas there seem to be only two beds of coal, which lie below the coal measure proper, beneath the conglomerate (Lesquerieux.) D. D. Owen speaks of some beds from 4 to 5 ft. thick, and estimates the area occupied by productive beds at 12,000 square miles.

In this Indian Territory little is known of coal. The officers of the Missouri, Kansas & Texas Railway Company find good banks of coal at several places along their line several feet thick. The area upon the map amounts to as much as 13,600 square miles. Since the completion of the map it has been ascertained that the coal measures are covered by the cretaceous formation for the width of about 30 miles along the valley of the Red River in Texas and the Indian territory, and also that the tertiary area extending southerly from Preston is probably of carboniferous age. These discoveries will enlarge, rather than diminish the size of the Missouri basin, since the two fields are probably connected hithertho the cretaceous beds.

In Texas according to A. B. Roessler, in the "Almanac," the coal measures occupy 6,000 square miles. A bed of coal has been reported near Fort Belknap as 4 feet thick. Estimating from Hayden's map the coal area in Nebraska at 3,600 square miles, the total area of this great basin must be 104,600 square miles.

In Arizona, near Camp Apache, Mr. G. K. Gilbert, of the expedition under the immediate direction of Lieutenant George M. Wheeler, reports a bed of coal belonging to the true carboniferous series. It is probable that future explorations may develop other coal-bearing areas in the Territories.

In this sketch no notice is taken of any coals which do not belong to the carboniferous system. Other coals of commercial importance exist, especially in Eastern Virginia and near the Union Pacific Railway. They usually belong to the triassic or cretaceous formations, and there are lignites in the tertiary.

BUSINESS AT THE STOCK BOARD.—The weekly sales at the San Francisco Stock and Exchange Board, for the past six weeks, have been as follows:

Week ending April 9.....	\$1,685,460
Week ending April 16.....	2,097,700
Week ending April 23.....	2,547,000
Week ending April 30.....	3,037,400
Week ending May 7.....	3,934,000
Week ending May 14.....	4,914,000

MECHANICAL PROGRESS

The Mexican Method of Making Hard Lime Floors.

Gen. T. G. Ellis has recently communicated to the American Society of Civil Engineers some interesting facts with regard to the manner in which the Mexicans make hard lime floors, sidewalks, roofs, etc. We condense from the *Journal of the Franklin Institute* for the present month.—It is well known that the Mexicans, in many localities make floors and pavements of lime and sand over which horses may travel for an indefinite length of time without making thereupon any more impression than would be made upon a smooth surface of granite or slate.

In making these floors the limestone used is a very hard, blue material, calcined and slaked as soon as cool. It may be used immediately after slaking or carefully kept in barrels four or six weeks. In making the floors, a layer of broken limestone, three or four inches thick, is first laid evenly over the surface of the ground. The stone being about the usual sizes for macadamizing roads; over this a mortar of about two parts of sand to one of lime is carefully and evenly spread to the thickness of one and a half to two inches; this is allowed to remain for about twenty four hours, or until the surface has become quite dry.

The floor is then thoroughly pounded all over with a tool composed of a block of wood about a foot square and three inches thick, having a handle rising from the middle, so that a man could stand while using it. The whole surface is beaten over with this ram until it is again as soft and moist as when first laid. This operation of ramming brings the water in the mortar to the surface so as to form a layer of semi-fluid substance on top.

The floor is now again allowed to dry, and again beaten over each day for about a week, or until the operation brings only a slight amount of moisture to the surface.

Immediately after the last pounding the surface is polished as follows:

A smooth, nearly flat, water-worn stone, a little larger than the fist, is selected, and with this the whole floor is laboriously gone over, rubbing down and leaving the surface of the lime as smooth as a piece of polished stone.

In less than a week the floors made in this way are sufficiently hard to bear the weight of a horse without indentation.

Roofs made in the same manner are perfectly water-proof and unaffected in any manner by sun or rain. In the Mexican city of Monterey, the sidewalks in the principal streets are made in this manner, and last for years, wearing through only like blocks of stone.

In making floors, an earthy reddish pigment clay, colored with sesqui oxide of iron is powdered over the lime just after the last pounding and before polishing. The pigment is thus ground into the upper surface of the composition, giving a soft brownish tint.

The great durability and strength of these floors or pavements is said to be entirely owing to the repeated pounding operation to which they are subjected; as the same materials applied and dried, in the ordinary way, without pounding, will not harden so, but that they will be readily indented by the round of a chair or a boot heel.

It is believed that this method of preparing hard surfaces has never been practiced outside of Mexico; although it seems singular that it should be used so generally by a neighboring nation, and be wholly unknown to our builders.

In commenting upon the above, E. A. Fierste, C. E., a member of the Society of Civil Engineers, remarks:

"That the description above given of the method of consolidating the mortar, etc., and even the employment of wooden compressors, explain accurately the process still followed in Spanish countries to form the floorings of plazas, public walks, etc.; and in many cases, immediately before the cement becomes set, its surface is polished with a smooth cobble stone until it acquires a high and lasting lustre."

A cement called "revocado" by Spanish engineers is made by mixing in several proportions fat limes with sand and under-burnt brick dust. The usual proportions are measured by equal volumes of the three materials; but when the cement is to be used for stopping roof leaks, cementing cellars, or where blows upon the cement are not anticipated, the proportion of sand is greatly diminished, and even suppressed altogether.

The Spanish learned the compounding of this cement from the Biscayan probably; and I doubt if the Romans had anything to do with its introduction in Spain, because the ruins of ancient water channels with "revocado" exist in the Basque provinces, where neither Romans nor Moore ever penetrated. The Biscayans, in their turn, are the most ancient people with whom we are acquainted, it being probable that they preceded the Phenicians.

I have seen Spanish "revocado" in Mexico, and it is natural to suppose that the Spaniards introduced the art in that country during the conquest.

The following question is put, and left unanswered by the Society's Printing Committee: Is this "pounding process" of the Mexicans

anything more than a simple yet effectual method of freeing the mortar of its surplus water, and thereby insuring a condition in which the lime can pass to a crystalline carbonate, at the same time compacting the whole mass into the best possible state?

A FAMOUS ARMORER.—Andrea de Ferrara, was the most famous armorer of modern times. He first came into note in the "Highlands of Scotland." It is said that he was the only person who could forge armor that would resist the Sheffield arrow-heads, or make swords that would vie with the best weapons of Toledo and Milan. He is supposed to have learned his art in the Italian city, whence he was called, and, under the patronage of the King of Scotland, to have practiced it in secrecy among the Highland hills, as all his genuine blades were marked with a crown; and before his time no man in Great Britain could temper a sword in such a way that the point should touch the hilt and spring back uninjured. He is said to have worked in a dark cellar, the better to enable him to perceive the effect of the heat upon the metal, and to watch the nicety of the tempering; as well as possibly to serve as a screen to his secret method of working. Many of his blades, with new basket hilts, are to be found in the Scottish regiments of the present day.

IMITATION OF MARBLE.—The preparations of slate in imitation of marble appear to be largely coming into use at the East. The imitation is prepared in the following manner. The slabs of slate are first surfaced by a planer, and brought to the required thickness. Patterns are then laid upon the slabs, and the mallet and chisel work out the required forms and mouldings. The marbleizing is the peculiar feature in the operation. The marbleizing material is prepared in a vat, and the slab is let down on the composition, which adheres to the slate. The slab is next baked in an oven for one night, then gets a coat of varnish manufactured for that especial purpose, and after six repetitions of these processes, it is finally removed and polished, the surface presenting a beautiful appearance. So firmly united to the slate is this coating, that it cannot be scaled or clipped off, without taking the slaty particles with it.

CAMPHOR WOOD.—This wood promises to become, at no distant day, a very valuable and important article of commerce. It grows freely in tropical countries, without cultivation, and especially thrives near the sea coast, where it may be easily obtained for shipment. It attains large proportions, being sometimes found fifteen ft. and upwards in diameter, and of proportionate height. It is very valuable for carpenter's work, being light, durable and not liable to injury from insects. Its aromatic, agreeable perfume is also well known. The wood is strong and very durable, and is especially applicable for ship building, and may be applied to all purposes for which teak wood is used. Camphor wood piles have been known to remain in a good state of preservation over 100 years.

SILICON STEEL. to which we have several times referred, seems to be making its way into practical use. Its manufacture has been patented in England. The *Journal of Iron and Steel* in speaking of it says: "The pig iron from which it is made is melted in a suitable furnace, and when nearly melted an addition of from 15 to 40 per cent of its weight of silicic iron ore, mixed with coke, is made, and well stirred into the metal, after which it is run into pots and placed at the sides of the furnace, holding about half a ton each, in which it is well stirred up until it "balls up," or comes to nature, as it is termed. Silicon steel, when of good quality, is stated to contain 0.600 per cent. carbon, along with 0.552 per cent silicon."

TIDAL POWER MACHINE.—A practical trial recently took place in Brooklyn of Edward W. Morton's machine, worked by the rise and fall of the tide, the power thus derived to be utilized for mechanical purposes. The contrivance was tried at the foot of South Tenth street, East River, before a large number of persons interested. The machine works by means of a "float," which, as it rises and falls with the waves or the tide, propels the machinery to which it may be attached. At the trial it was geared to a saw, and worked with the full rapidity of a circular saw run by steam power, although, perhaps, not quite so uniformly.

WEARING OF CAST IRON SURFACES.—The wearing of cast-iron surfaces exposed to sliding friction can be almost wholly prevented by tempering with a mixture of 21 1/2 pints of water, 30 1/2 pounds sulphuric acid, 1,003 grains of nitric acid. The articles should be heated to a cherry red, and protected from the oxidizing effects of currents of air by a sheet iron box. The process is especially adapted to the hardening of bearings of axles, which while much cheaper than those of the usual alloy, will, when regularly lubricated, last as long, even when there is great rapidity of motion.

ASBESTOS PACKING appears to be still gaining in favor. A late exchange says that this packing in ocean-going steamers, put in more than sixteen months since, is still apparently as perfect as ever. The Anglia one of the Anchor Line Transatlantic passenger steamers, has made fourteen trips to America and back, having steamed on the same packing over 98,000 miles.

SCIENTIFIC PROGRESS.

Quantitative Spectroscopic Analysis.

The special merit of the spectroscope has heretofore been regarded to be the determination of the presence of certain elements in a luminous body, when there is such minute traces as to altogether defy detection by other known methods of analysis. The idea of extending the indications of this method of analysis to the estimate of quantitative values has often been suggested, but the difficulties to be overcome are very great.

Quite recently the subject has received considerable attention in learned circles, in consequence of a communication to the French Academy by M. Janssen, the eminent spectroscopist, who has pointed out very clearly, in a memoir to that society, the principles upon which such an application of the spectroscope might be based.

Mr. Janssen indicates two independent methods of procedure in such investigations, which may be employed simultaneously, and so serve as a species of control upon results obtained.

One of these methods is to measure the intensity of the bright lines afforded by a substance in the spectrum; the other is the measurement of the time required for the complete volatilization of a substance in the flame.

It is said that an apparatus constructed to take advantage of the first named method has been successfully employed to determine the quantity of certain elements in the ashes of plants.

Should further experiment verify the expectation here expressed, the practical value of the spectroscope, which has already achieved wonders, will be greatly enhanced.

ELECTRICAL CONDUCTIVITY AFFECTED BY LIGHT.

A most curious experiment, involving an alteration in the electrical conductivity of the element selenium, an element of very high resistance, has recently been published by Mr. Willoughby Smith. Mr. Smith took several small bars of this substance; each bar hermetically sealed in a glass tube, and had a platinum wire at each end for the purpose of connection. It was found that the resistance altered materially, according to the intensity of light to which the element was subjected. When the bars were fixed in a box with a sealed cover, so as to exclude all light, their resistance was at a maximum, and remained very constant; but immediately the cover was removed, the conductivity increased from 15 to 100 per cent., according to the intensity of the light falling upon the box. The mere interception of the light, by passing the hand before an ordinary gas-burner placed several feet from the bar, increased the resistance 15 to 20 per cent. When the light was intercepted by glass of various colors the resistance varied according to the amount of light passed through. To insure that the temperature had nothing to do with the results obtained, one of the bars was placed in a trough of water, so that there should be an inch of liquid for the light to pass through. The results under these conditions were the same. And again, when a strong light, from the ignition of a narrow band of magnesium, was held about six inches above the sealed tube, the resistance immediately fell more than two-thirds, returning to its normal condition, immediate the light was extinguished.

NEW MODE OF DETERMINING THE AMOUNT OF MERCURY IN ITS ORES.—A German exchange contains a description of Escha's new mode of determining the amount of mercury which may exist in its ores. The discovery is pronounced a very valuable one, and the process is as follows:

The pulverized ore, after weighing, is placed in a porcelain crucible, the edge of which has been ground. It is there mixed with about half its weight of pure iron filings, and the whole covered with a layer of the latter. The crucible is then covered with a weighed concave lid of gold having an even edge, and the depression in the cover is filled with distilled water. The crucible is then heated for ten minutes in a flame which surrounds the lower portion of the crucible. At the end of this period which suffices to volatilize all the mercury, the gold lid, which has amalgamated with the mercury, is taken off, the water poured out, and the mirror of mercury on the convex side washed out with alcohol, dried on a water bath, and, after cooling, weighed. The increase in the weight of the gold cover corresponds to the amount of mercury in the ore—the accuracy of the result depending, of course, on the carefulness of the manipulation attending the process.

AMMONIA IN SNOW.—The amount of ammonia in snow of different temperatures has recently been determined at Munich by Vogel. Freshly fallen snow at 6° C. furnished water that contained 0.003 gramme to the litre; snow at —3° C., 0.002; and snow that fell at —9° to —15° was entirely free from ammonia. Snow that had lain twenty-four hours on a field which had been mowed the previous autumn was found, when melted, to contain 0.012 gramme per litre of ammonia. Other snow that had been for twenty-four hours on the zinc roof of a house had absorbed 0.009 gramme.

TURPENTINE AS AN ANTIDOTE TO PHOSPHORUS.—Turpentine oil has often been recommended as an antidote to poisoning by phosphorus. For this purpose it is essential that it contain oxygen, which is the case of ordinary oil of turpentine not recently rectified. The oil is best introduced into the stomach in gelatinous capsules, 100 grains being required to neutralize one grain of phosphorus.

Some have supposed that turpentine has the power of checking the oxygen-stealing action of phosphorus and phosphureted hydrogen in the blood. Dr. Köhler, however, thinks that at first a genuine chemical compound is formed, by oxidation of the phosphorus, and that this then unites with the essential oil to form a second compound which is harmless.

More recent experiments confirm the latter view of the case. If three-fourths of an ounce of phosphorus be gradually added to two pounds ordinary turpentine oil, warmed to 104° Fah., and the mixture be shaken on the sand bath, there crystallizes out, on cooling, a white solid, which is separated from the excess of phosphorus by crystallization from alcohol. This substance he calls *turpentine phosphoric acid*. When turpentine is administered in cases of phosphorus poisoning, this acid is discharged in the urine, and is found in the alkaline distillate by distilling the urine. This distillate has the power of reducing corrosive sublimate to calomel, and precipitates metallic silver from solutions of its salts.

When the turpentine phosphoric acid is heated in a stream of hydrogen at 104°, inflammable phosphureted hydrogen is involved.—*Am. Artisan.*

SCIENTIFIC PROGRESS.—The practical uses and advantages of science is especially observable in what it has done in introducing into the arts, and gradually developing into manifold use, that compound known as bisulphide of carbon. Up to the year 1850, the only industrial application of bisulphide of carbon was the dissolution and vulcanization of india rubber. Since that time it has been applied to the following uses: 1. The complete extraction of the fatty matter from bones used in the fabrication of bone-blives. 2. The extraction of oil from grain and olives. 3. The removal of sulphur from earth in which it is contained and also oil from bituminous rocks. 4. The scouring and elimination of greasy substance from wool by the Systerth and similar processes. 5. The extraction of the soluble principle of spices. 6. The fabrication of yellow prussiate of potash, and of sulphocyanide of ammonium, for making Pharaoh's serpents. 7. The preparation of Greek fire; a solution of phosphorus in the bisulphide is used for filling inflammatory rockets or shells. 8. For silver-plating; a small quantity placed in the bath increases the brilliancy of the deposit. 9. For the destruction of vermin. 10. For filling glass prisms, on account of the brilliancy of the colors of its spectrum. 11. For diving by its vapor all classes of engines, with or without expansion.

A BEAUTIFUL EXPERIMENT ON SOUND.—The following beautiful experiment, described by Prof. Tyndall, shows how music may be transmitted by an ordinary wooden rod. In a room two floors beneath his lecture-room, there was a piano upon which an artist was playing, but the audience could not hear it. A rod of deal, with its lower end resting upon the sounding-board of the piano, extended upward through the two floors, its upper end being exposed before the lecture table. But still no sound was heard. A violin was then placed upon the end of the rod, which was thrown into resonance by the ascending thrills, and instantly the music of the piano was given out in the lecture-room. A guitar and a harp were substituted for the violin, and with the same result. The vibrations of the piano-string were communicated to the sounding-board, they traversed the long rod, were reproduced by the resonant bodies above, the air was carved into waves, and the whole musical composition was delivered to the listening audience.—*Nature.*

THE STRUGGLE FOR LIFE AMONG PLANTS.—Each plant endeavors, almost consciously, to destroy his neighbor, to occupy his ground, to feed upon his nutriment, to devour his substance. There are armies and invasions of grasses, barbarian inroads and extirpations. Every inch of ground is contested by the weeds; the forest is a struggle for precedence; the Wars of the Roses are a perennial feud. The serenest landscape, the stillest woodland, are the mortal arena of vegetable and animal conflict.

AN IMPROVEMENT IN THE MANUFACTURE OF GLUCOSE has been discovered by Mr. Krothe. By adding a small quantity of nitric acid to the sulphuric acid, in converting starch into syrup (glucose), he is able to save half the time required for affecting the conversion by the use of sulphuric acid alone. In preparing solid glucose the saving of time is much greater.

In view of the great demand for solid glucose (grape sugar), this discovery may be considered a very important one.

THE SUPPOSED PLANET BETWEEN MERCURY AND THE SUN.—The existence of an intra-Mercurial planet has been frequently argued upon astronomical grounds, and no objective proof of its presence has yet been presented. In further evidence of the existence of such a planet, Mr. Cowie has telegraphed from Shanghai an account of a recent observation in which he assumes that a black spot seen on the sun's disk, on March 24th, marked, in reality, the transit of the supposed planet.

Assessments, Meetings, Dividends.

[UNREPRODUCED DAILY FOR THE MINING PRESS.]

ASSESSMENTS.—Stocks on the Lists of the Boards.

Company.	Location.	No.	Amt.	Levied.	Delinq't.	Sal.	Secretary.	Place of Business.
Albion G & M Co.	Amador Co., Cal.	4	100	May 13	June 17	July 8	Joel F. Lightner.	438 California st.
Alps Co.	"	4	50	May 8	June 11	July 8	C. E. Balcorn.	420 Montgomery st.
Alta & Plac. M. Co.	Washoe.	1	100	June 24	July 24	Aug. 1	W. E. Dean.	418 California st.
Bellvue M. Co.	Placer Co., Cal.	6	50	April 14	May 19	June 9	T. F. Cronine.	438 California st.
Baltimore Con. M. Co.	Nevada.	2	75	Mar. 31	May 6	May 29	D. T. Basley.	401 California st.
Bowery Con. M. Co.	Ely District.	3	50	May 5	June 16	June 16	C. E. Elliott.	401 California st.
Cam. & Hunt S. & C. Co.	Ely District.	3	50	May 29	June 29	July 1	H. C. Minor.	411 1/2 California st.
Can. Virginia M. Co.	Nev.	14	300	Apr. 9	May 14	June 9	D. T. Basley.	401 California st.
Empire M. Co.	"	3	100	Apr. 10	May 17	June 6	C. F. Balcorn.	420 Montgomery st.
Empire M. & M. Co.	"	3	100	Apr. 10	May 17	June 6	D. T. Basley.	401 California st.
Essex Mining Co.	Nevada.	7	15	April 11	May 14	May 31	H. C. Howard.	623 Montgomery st.
Gould & Curry.	Washoe.	17	100	Apr. 9	May 14	June 4	A. K. Durbrow.	Merch. Exch'g
Hayes G. & S. M. Co.	Robinson Dist.	2	25	May 16	June 19	July 15	Geo. R. Spinney.	320 California st.
Hermes M. Co.	Ely District.	5	150	May 12	June 16	July 16	W. E. Dean.	418 California st.
Hunt & Hunt S. & C. Co.	Ely District.	6	150	May 12	June 18	July 16	T. W. Colburn.	418 California st.
Ide Elmore M. Co.	Idaho.	9	250	Mar. 25	Apr. 28	May 20	Wm. Willis.	418 California st.
Imperial S. M. Co.	Cal.	16	100	Apr. 8	May 12	June 3	W. E. Dean.	418 California st.
Independent Gold Mining Co.	Washoe.	1	25	May 5	June 5	June 27	R. Landerer.	507 Montgomery st.
Justice M. Co.	Washoe.	1	50	Apr. 23	May 28	June 18	R. Wegener.	414 California st.
Kentuck M. Co.	Washoe.	10	100	April 23	May 23	June 19	Frank Swift.	445 Montgomery st.
Kentuck & S. S. M. Co.	Idaho.	8	250	Mar. 31	May 18	June 18	J. W. Caldwell.	508 Montgomery st.
Kentuck & S. S. M. Co.	Idaho.	8	250	Mar. 31	May 10	May 31	E. McFadden.	1 Express Bldg.
Mint G. & S. M. Co.	Storey Co., Nev.	10	100	May 6	June 10	June 30	D. A. Jennings.	401 California st.
Newark K. M. Co.	Ely District.	4	50	Apr. 10	May 20	June 14	D. T. Basley.	401 California st.
North Nevada M. Co.	Nevada.	25	50	Apr. 30	May 30	June 12	Merch. Exch'g	418 California st.
Pearline M. Co.	Ely District.	4	25	June 12	June 11	July 12	C. F. Balcorn.	420 Montgomery st.
Phenix Silver Mining Co.	Enreka Dist.	10	25	Apr. 16	May 21	June 11	Joseph Maguln.	418 California st.
Pioche Phenix M. Co.	Ely District.	3	100	May 10	June 19	July 11	C. E. Elliott.	401 California st.
Portland S. M. Co.	Ely District.	3	100	May 16	June 16	July 22	J. C. Gray.	414 California st.
Portland S. M. Co.	Ely District.	1	25	May 6	June 9	July 1	B. J. Gray.	438 California st.
Savage Mining Co.	Nevada.	9	100	Apr. 5	May 9	May 27	E. B. Holmes.	1 Fireman's Fund Bldg.
Silver Peak M. Co.	Nevada.	2	15	Apr. 3	May 8	May 28	H. O. Kibbe.	418 California st.
Silver Peak & O. Co.	Eureka, Nev.	1	25	Apr. 15	May 15	June 15	Merch. Exch'g	Montgomery st.
Standard M. & M. Co.	Ely District.	1	200	May 13	June 21	July 1	M. N. Lenzander.	515 California st.
Utah S. M. Co.	Cal.	1	100	May 6	June 10	July 2	W. E. Dean.	418 California st.
Virginia Con. M. Co.	Lyvo. Cal.	5	5	May 5	June 16	July 8	T. B. Clegg.	318 California st.
Virginia Con. M. Co.	Lyvo. Cal.	8	25	Apr. 25	May 25	June 15	D. B. Clegg.	318 California st.

Atlantic and Pacific Con. M. Co.	Cal.	4	6	Apr. 26	May 30	June 17	A. Noel.	419 California st.
Alhambra M. Co.	Nevada.	14	1 50	Mar. 25	Apr. 26	May 20	J. O. Strauch.	210 Front st.

Atlantic and Pacific Con. M. Co.	Cal.	4	6	Apr. 26	May 30	June 17	A. Noel.	419 California st.
Alhambra M. Co.	Nevada.	14	150	Mar. 25	May 26	May 26	J. O. Straub.	210 Front st.
Angels Q. M. Co.	Cal.	1	150	Mar. 4	Apr. 3	May 21	Geo. Coagdon.	498 California st.
Anshurn G. M. Co.	Placer Co., Cal.	4	60	Apr. 24	June 3	June 24	R. Wegner.	414 California st.
Antelope Flats, Ex.	Cal.	1	50	Mar. 25	Apr. 25	May 21	W. M. Scherer.	605 24 Montgomery st.
Autio Flat Blue Gravel M. Co.	Cal.	2	50	May 13	June 14	July 14	W. M. Helman	401 California st.
El Do ado Quartz M. Co.	Cal.	1	5	Apr. 1	May 5	May 26	G. W. R. King.	411 California st.
Eagle Q. M. Co.	Santa Barbara Co., Cal.	2	50	Mar. 25	May 22	June 22	W. M. Helman.	302 Montgomery st.
El Dorado M. Co.	Siskiyou Co., Cal.	1	100	May 1	June 9	June 20	T. F. Cronise.	438 California st.
Equitable Tunnel & M. Co.	Cal.	2	10	May 6	June 10	June 30	C. S. Healy.	Merchants Ex.
Esas Buena Con. S. M. Co.	Nevada.	2	25	Mar. 27	May 3	May 24	A. Noel.	419 California st.
Green Run, M. Co.	El Dorado Co., Cal.	1	10	May 13	June 13	June 13	A. J. Holmes.	Cor. Wash. & 2d.
Green Valley M. Co.	Placer Co., Cal.	2	10	May 16	June 21	July 14	A. D. Carpenter.	605 Clay st.
Hardy Coal Mining Co.	Cal.	1	100	Mar. 28	May 1	May 24	Jacob Hardy.	338 Montgomery st.
Hesloe M. & M. Co.	Mariposa Co.	1	60	May 14	June 28	July 27	J. W. Tripp.	408 California st.
Hill & M. Mining Co.	Lower Cal.	1	100	Mar. 25	Apr. 2	May 2	W. M. Aggeste.	729 Montgomery st.
Hobbs G. M. Co.	El Dorado Co.	1	25	Apr. 15	May 17	June 9	A. D. Carpenter.	605 Clay st.
Kincaid Flat M. Co.	Cal.	2	60	May 6	June 9	June 9	R. H. Cornish.	217 Sansome st.
Lady Esen Tunnel and M. Co.	Utah.	5	5	Mar. 17	Apr. 30	May 15	Ohas. S. Healy.	35 New Merch's Ex.
Lone Pine M. Co.	El Dorado Co.	1	50	Mar. 25	Apr. 24	May 24	W. M. Gamc.	320 Sansome st.
Maizeppa S. M. Co.	Elly District	1	50	May 10	June 24	July 12	L. Franconi.	314 California st.
Newton Booth Con.	Elly District	1	50	May 7	June 14	July 12	H. C. Clelland.	414 California st.
Occident G. and S. M. Co.	White Pine.	2	25	May 10	June 12	June 9	S. Phillips.	415 Montgomery st.
Or. Portland Cement Co.	Cal.	3	25	May 10	June 12	June 9	D. Wilder.	Merchants Ex.
Oreaga Table Mt. Co.	Cal.	1	5	April 8	May 10	June 2	D. A. Jennings.	401 California st.
Pachontas G. M. Co.	El Dorado Co., Cal.	12	50	April 26	May 30	June 23	W. Phillips.	414 California st.
Pine Bluffs S. M. Co.	Nevada Co.	1	100	May 1	June 2	June 2	J. M. Battling.	37 New Merch's Ex.
Rising Star M. Co.	Nevada Co., Cal.	4	6	May 5	May 29	June 16	Wm. Stuart.	113 Leidesdorf st.
Sanderson G. M. Co.	Railroad Flat, Cal.	1	4	May 6	June 2	June 9	R. P. Taylor.	107 Front st.
San Joas M. Co.	White Pine.	2	600	Apr. 3	Apr. 23	May 23	C. Yan Winkle.	304 California st.
Schell Creek M. Co.	Cal.	1	100	Apr. 3	May 24	June 10	O. T. Fay.	603 Montgomery st.
Sierra Iron Co.	Cal.	1	100	Apr. 1	May 10	June 3	T. W. Colburn.	419 California st.
Spring Mount M. Co.	Cal.	50	50	May 14	June 21	June 18	L. Koplan.	Merchants Ex.
Starr King S. M. Co.	Nevada.	2	1	May 27	May 1	May 20	A. Mayton.	401 Montgomery st.
St. Marys M. Co.	California.	1	2	May 8	June 5	June 5	Geo. Davidson.	347 Montgomery st.
Summit M. Co.	Amador Co., Cal.	3	25	May 3	June 5	June 26	E. P. Gray.	42 Kearny st.
Swansea Mining Company.	El Dorado.	2	2 1/2	Mar. 28	Apr. 28	May 28		

THURSDAY EVE, May 22, 1873.

In view of the large dividends of the month from the Crown Point and Belcher mines the following table showing the dividends paid by them since January 1872 will be interesting:

Totals.....	\$44,000	\$1,577,000	\$39 60	\$3,960,000
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The Crown Point commenced paying dividends in June 1871 after not doing so since September, 1868. In January, 1872, the Belcher began to pay dividends. Both these mines combined have paid since January, 1872 the sum of \$8,530,000, of which \$4,180,000 has been paid since January last.

The dividends for May amounted to \$1,872,000 and the assessments delinquent as above are \$616,900. The dividends for the past five months, this year, have amounted to the sum of \$5,165,181, and the assessments amount to \$2,829,730, the dividends exceeding the assessments by \$2,335,451, and the above average of \$1,000,000 per month.

The sales at the Stock Board for the past few weeks sum up as follows:

Week ending April 9.....	\$1,585,466
Week ending April 16.....	2,097,700
Week ending April 23.....	2,547,700
Week ending April 30.....	5,037,400
Week ending May 7.....	5,324,000
Week ending May 14.....	4,914,000

On Saturday stocks were pretty lively, and there was an unusually long session of the Board in the morning, lasting about 2¾ hours.

Yesterday's market showed decided weakness, with few orders and a downward tendency in prices, there being few orders to buy and many to sell.

The following items of interest from prominent mines are collated from letters or telegrams from superintendents on file at the offices of the respective companies in this city.

Aladdin.

Dispatch of the 19th instant says that the new developments in 5th and 6th levels continue flattering. Are sending ore to mill; mill now running on Flag ore. Everything progressing finely and about the mine.

Buckeye.
Letter of the 15th says we have nothing new to or important to report from the mine to-day.

through to the level of the incline. The incline is being sunk as fast as circumstances will permit. The rock in the bottom still continues very hard. The various prospect drifts are being carried forward with all possible energy without having as yet met with any material change. The south drift at 1300-foot level has now reached 137 feet south

yield their usual quantity of fine ore. Those on the 1200 and 1300-foot levels are opening out splendidly and showing a general improvement in the character of the ore. Daily yield of the mine is about 560 tons. Our new hoilers have been received and will be put up at once.

to date, they have shipped 6,850¹/₂ tons of ore, which will aggregate about \$529,112.55. General average per ton, \$77.15. On account of the breaking of the spur wheel of the pump, they have not been able to extract the usual amount of ore. The new spur wheel is being placed in position and will be

running off the isthmus. Think they have struck the east wall of the continuous good ore, which will give an average assay of about \$28.96 per ton. Connection was made yesterday with the fifth floor crosscut of the 1300-foot level, and the winze from the 1200-foot level affords a good circulation of air. The last six feet of the third floor crosscut has been in place, which will assay \$35 per ton, and still good ore in the recess

n.	Secretary.	Office in S.F.	Meeting.	Date
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Name of Co.	Location.	Secretary.	Office in S. F.	Meeting.	Date
Cadrams P. Co.	Emeralda Co.	E. F. Bent.	222 California st.	Annual	June 25
Cherokee Pl. & Gravel Co.	Cal.	W. C. Wasted, Trustee.	222 California st.	Annual	June 25
Crown Point C. & S. M. Co.	Washos.	E. C. Elliott.	419 California st.	Annual	June 25
Dardanelle.		Called by Trustee.	411 California st.	Special	May 25
Exordale Gravel M. Co.		A. W. Valerius, Trustee.	301 California st.	May 25	June 25
Green G. & S. M. Co.		S. Phillips.	408 California st.	Annual	June 25
Greene M. Co.	Placer Co.	Clay M. Greene.	430 California st.	Annual	May 25
Heckerdorf & S. N. Co.		Louie Ferme.	150 Jackson st.	Annual	May 25
Idaho Rhoda Lewis M. Co.		A. C. Morse.	10 Webb st.	Annual	June 1
Lonise M. Co.		Wm. H. Watson.	302 Montgomery st.	Annual	May 31
Mammoth S. M. Co.		J. L. King.	411 California st.	Annual	June 1
Minnesota & S. M. Co.	Idaho.	Wm. W. M.	302 Montgomery st.	Annual	June 1
Red Jacket G. & S. M. Co.	Gold Hill.	H. C. Howard.	332 Montgomery st.	Special	June 1
Silver Hill M. Co.		W. E. Dean.	419 California st.	Annual	May 25
Stevens' Pacific Smelting & M. Co.		T. H. Hold.	320 Montgomery st.	Special	May 25
Traskes M. Co.	Esmeralda Co., Nev.	J. Campbell.	222 California st.	Annual	May 25
Yule Gravel M. Co.		Wm. H. Watson.	302 Montgomery st.	Annual	May 25

Secretary.	Office in S. F.	Amount.	Payable
J. C. Kihhe.	419 California St.	8 00	May 10

Name of Co.	Location.	Secretary.	Office in S. F.	Amount.	Payable
Belcher M. Co.	Washoe.	H. C. Kihbe.	419 California St.	8 00	May 10
Black Diamond Coal Co.	California.	P. B. Cornwall.	Cr. Harrison & Spear.	50 per cent.	Mar. 10
Cederberg G. M. Co.	California.	D. M. Bokes.	420 Montgomery St.	50c	Feb. 10
Com. Amador M. Co.	Cal.	F. B. Matham.	402 Montgomery St.	10 00	May 10
Crown Point & S. M. Co.	Washoe.	O. E. Elliot.	419 California St.	10 00	May 10
Dana M. Co.		N. C. Fascet.	220 Clay St.	1 00	Jan. 2
Eastport Coos Bay Coal.	Oregon.	J. L. Pool.	Merchants' Ex.	6 00	Apr. 1
Eureka G. M. Co.	Grass Valley.	K. Wecker.	414 California St.	1 00	Aug. 1
Gallegos G. M. S. M. Co.	Idaho.	E. McFadden.	402 Mont'gry St.	1 50	Jan. 1
Meadow Valley M. Co.	Ely District.	T. W. Colburn.	408 California St.	1 00	Jan. 1
Monitor-Belmont M. Co.	Nevada.	B. B. Minor.	411 1/2 California St.	1 50	Mar. 1
Flodge B. Co.	Ely Dist., Nev.	411 California St.	411 California St.	1 00	Apr. 1
Evadence G. S. M. Co.		J. M. Buntington.	Merchants' Ex.	1 00	Nov. 1
Raymond & Ely M. Co.	Ely Dist., Nev.	A. J. Moulder.	419 California St.	6 00	Feb. 1

Letter of the 17th says: For week ending to-day the following is a summary of operations in the company's mine. Ore extracted, 737 tons; forwarded to mill, 747 tons 1,300 pounds. Average assay value of ore from mine as determined from sample \$38.42 per ton. No important changes.

Chief of the Hill.

Eureka, Grass Valley.
Letter of the 17th says the clean-up for the last six days run of ten stamps and the proceeds from thirty tons of quartz is 1,300 ounces of amalgam. There are no change in the bottom. The ledge in the east drift, sixth level, is

Letter of the 15th says they have stopped fifth level drift south. It has worked very hard the last 30 feet. The whole length of drift is 465 feet. The sixth level drift south is an 18 inch vein with some apote and lunchee and rich ore, but it shows so compact body yet. Winze from 7th to 8th is

Gould & Curry.
Letter of the 20th says that in the mine is little change to note. The various shafts and crosscuts have been carried forward day and night, without intermissions. The shaft on 1600-foot level is being run as fast as possible. It

Letter of the 13th says the drift connecting winze between the 1690 and 1700-foot levels show some very fine ore. In the upper portions of the mine there is some chert to be seen.

Letter of the 13th says the ledge continues to look well as we drift west on it. Are now in north drift on ledge 20 feet. The assays taken the last two days go higher. One assay made to-day, from the face of the drift, went \$1,000 per ton.

Julia.

Letter of the 17th says the mine looks favorable this week. Have sunk the shaft eight feet and advanced the south drift twelve feet. The ledge is three feet wide. Looking very well. It is improving as we advance.

Nevada Tunnel.

The Superintendent of this mine, which is situated at American Flat, Gold Hill, Nevada, writes under date of the 20th that the ledge is improving as it is sunk upon. It is now four feet wide, and the average assays, by our samples, give \$27 per ton. They started a new shaft last week and

are grading for new hoisting works, which will be put up as soon as possible.

Ophir.

Letter of the 17th says there is nothing new to report today. All work is going on as usual. No important changes.

yet. **Page & Panaca.**
Letter of the 15th says the face of drift is now 776 feet from shaft. This morning we struck seam in quartz, containing lead and sulphurate of iron which assays \$40 per ton of mill-
like others, through which we have passed.

is pitching into the hill, through face of the drift, which indicates that if they belong to the main lead it must be further ahead. We have now no water in face, and hat little along the drift.

Phoenix Tunnel.

Letter of the 13th says the tunnel has been driven 11 feet on contract. Rock is still of partially decomposed white lime, very hard in spots. Seams of clay filled with ochre, and pockets stained with ochreous material. The appearance of the rock is regular. It has every appearance of being in the vicinity of something and stockholders must wait patiently and feel hopeful. A few feet must determine what is its character.

Raymond & Ely.

Dispatch of the 16th says there is no change in the assays. Assays from the seventh level winze (Meadow Valley West Extension ground) gave \$300 per ton. Do not know how thick the ledge is. Improving in eighth level. Assay from that level gave \$300 per ton. Everything is going on all right.

Silver Hill.

Letter of the 20th says the main drift from the first station continues to improve as it is being run north. The upper part of the mine continues as last report. Assay today gives \$24.21. Ore shipped from mine on the 20th, 35 tons 1,300 pounds.

Senator.

Letter from the Superintendent, under date of the 15th and on the 12th of the sinking of the shaft. The bottom of the shaft shows some very good quartz, and the best indication of being close to ledge. Some of the quartz shows sulphurets of silver. On Monday and Wednesday of next week I will be better informed of the advisability of connecting the drift at this level.

Starr King.

Letter of the 12th says the furnace is a grand success. It is rolling out hullion at the rate of 8,000 pounds daily. Ore contains iron enough to smelt, in parts of the mine. There are some small pieces of bullion in the furnace, and it is in splendid order.

Sierra Nevada.

Letter of the 17th says they cleaned up battery and mill yesterday, and sent to mill 25 pounds of hullion. Amount of ore worked, was 840 tons. The running yesterday and doing good work. Average hullion shows increase. Are using wood for fuel, it is cheaper than coal. Think they can keep up their grade of ore the balance of the month. North vein fully holds its own. The ore is in a single sample are better than usual. Gravel stops about hold their own. The new stopes over the McDonald stopes, does not prospect so well. No change in the other parts of the mine. We produced to date this month, 43 tons, 34 men at work.

Silver Peak.

Letter of the 15th says there is nothing of particular importance to note to-day. Are still pushing the drifts east and west without marked change in either.

Woodville.

Letter of the 20th says: "I will send you one bar of bullion to-morrow and two more on Sunday next. There is more and better ore in sight in the mine than when I first commenced milling. Opening out the vein has shown an improvement. The mills also show the ore paying well."

MINING SUMMARY.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned:

California.

ALPINE COUNTY.

EXCHAMBER. Alpine Miner, May 17: We visited this mill on Silver Creek on Monday, and found that only a few finishing touches required to complete ready for turning out bullion. It now has only 8 stamps, but is so planned that the addition of more is a simple matter. It is arranged for wet reduction; Mr. Chalmers estimating that nearly 68 per cent. of the metal can be saved by this method, and that his system of concentration will give him the balance in nearly pure sulphurets, which can be treated by a reverberatory furnace and the whole saved.

M. & N.W. Co.—An assay of rock from the Glance shaft of M. & N.W. Co., made by Mr. Hunter a few days since, gave a 30 ft. level, in 125 ft. where several metal pans. Some rock from the Tarnish mine assayed at the same time gave a much higher value, the figures of which we have mislaid.

TARNISH MILL has been running most of the week but at this writing nothing definite can be arrived at as to the results; a clean up having been made. The experiment will be continued into next week. We hear of good prospects in the way of ore in the north drift from the lower level of the mine.

CALAVERAS COUNTY.

AUSTRIAN. Calaveras Chronicle, May 17. We understand that 3 locations have been made upon the ledge, and that a shaft is being sunk on each. The shafts are respectively at the 300 ft. level, in 125 ft. where several metal pans. Some rock from the Tarnish mine assayed at the same time gave a much higher value, the figures of which we have mislaid.

TARNISH MILL has been running most of the week but at this writing nothing definite can be arrived at as to the results; a clean up having been made. The experiment will be continued into next week. We hear of good prospects in the way of ore in the north drift from the lower level of the mine.

Good HOPE HOISTING WORKS.—We learn that the entire machinery for the new hoisting works to be erected upon the Good Hope mine at Mosquito is on the ground. The foundations are also laid and most of the framing completed.

EL DORADO COUNTY.

CLARKSVILLE Mountain Democrat, May 17: There are now 8 quartz ledges within 2 miles of here that are being successfully worked, viz: The Tong Company, Berry & Oram, and Taylor & McCarty. The Tong is about half a mile east of town; the Oram & Berry is about 3 miles north; the Taylor & McCarty mine is about 1 1/2 miles east of the Tong. This mine was discovered by S. Sponage, who took out in 3 weeks over \$33,000, and then sold out to Taylor & McCarty. Oram & Berry did well last season and expect to do better this year. They have their new shaft down about 70 ft. and have realized good pay out of the shaft the whole time they have been sinking. The Tong mine is now owned by a San Francisco Co. They have on the dump about 125 tons of quartz that will mill from \$12 to \$25 per ton. The shaft is now down about 135 ft., the ledge steadily widening and improving as it descends.

FRESNO COUNTY.

THE FORTUNA COAL Mine, owned by Wm. T. Williams, is situated N. W. from the New Idria Quicksilver Mines about 4 miles. The mine has been worked sufficient to prove its character. The ledge runs east and west and a tunnel has been run in some 200 ft. on the ledge which is opening out nicely. The New Idria Company has burned a large quantity of coal, which gave general satisfaction. About 200 ft. south of the ledge petroleum has been found in considerable quantities and of an excellent quality.

HUMBOLDT COUNTY.

HENNING. Silver State, May 17: This mine has been tolerably well developed by tunnels and cross-drifts a distance of about 200 ft. from the surface. The ledge is enclosed in limestone and is remarkably well defined and uniform in size. The average thickness of the vein being nearly 2 ft. has shipped considerable ore and has supplied the Pioneer mill for several months past. The ore is principally low grade, however, though rich sulphurets ore, in limited quantity, have been found at the greatest depth attained.

ADAMS.—This mine was discovered last Summer, and prospected by a tunnel on the ledge 150 ft. long. There are several tons of ore on the dump, and the ledge appears the entire length of the tunnel. The formation is similar to that of the Henning, though the course of the ledge is northeast, with a dip of about 25 degrees to the south.

GOV. BRADLEY.—This ledge is situated between the quartzite and limestone formations, and is well defined. It is prospected by a shaft 100 ft. deep, which follows the vein at about an incline of 70 degrees. The course of the Bradley is north and south, and the ore is, next the Arizona, the richest in the district.

HARRIS.—The mine is at present leased to Messrs. Harris & Phillips, experienced miners. Four men are employed, and at present the mine is yielding excellent ore the richest of which is shipped and yields from \$300 to \$450 per ton. The second-class is reduced here by the wet process, and yields about 60 per cent. of its assayed value. There was, at the time of our visit, a splendid lot of ore on the dump, which was being sacked for shipment, besides 30 or 40 tons of milling ore.

ARIZONA.—A new tramway, 175 ft. in length is just completed at the mine, to facilitate the removal of ores from the new or upper to the lower works. At the upper end of this tramway the ledge averages about 12 ft. in thickness, the ore-streak near the surface being about 2 ft. wide, much smaller than in other portions of the mine, the rock being harder work, and arriving at a point 300 ft. directly under the upper end of the new tramway, we found miners at work breaking down the ledge, which is from 10 to 14 ft. thick and carries a considerable amount of shipping ore, though the greater part of the large vein is millage ore. Pursuing our course to the extreme eastern end of the mine, 1,500 ft. from the mill, we found the ledge steadily increasing in incline, ft. below the level of the tunnel, the deepest point in the mine, a level is being opened on the ledge. The vein is 3 ft. 4 in. thick, by actual measurement, and sparkling with black sulphurets. It is designed to continue the drift in this direction and prospect the mine as far to the east as may be practicable.

INYO COUNTY.

DEEP SPRING.—Inyo Independent, May 17: As many of our local readers have obtained the impression that Deep Spring Valley and adjacent mines are entirely abandoned, we will take this occasion to correct the error. It is true that the mill stands idle, but there are several miners operating in the surrounding hills. Notwithstanding the fact that a prominent mill man has condemned their "white quartz" as worthless, the miners of deep spring are full in the faith that they have better mines than anybody. One of these mines, the "Berry," at 80 ft., shows a 5-ft. ledge, which we are assured assays from \$1,000 per ton as a body. The vein runs between walls is 8 ft. wide. The "Inyo" ledge, at 50 ft., has 2 ft. of ore assaying from \$100 to \$500 per ton.

KERN COUNTY.

CLARA BELLE DE BILK.—Havilah Miner, May 17: This mine, so named in consequence of its "petering" once, was visited by us last Saturday; 3 shafts are sunk on it. The deepest one has about a foot of water in it, which has caused a temporary suspension of work. The other two shafts are turning out a rich grade of ore, valued from \$40 to \$100 per ton. The ledge is small, averaging about 13 inches in width. Carson & Webb's works, had four tons of rock on the dump, taken out the day before, which we examined, and saw the gold richly sprinkled through it.

Next week, we are informed, the Bigler mill will commence a run on Argus rock, some 50 tons of which is now at the mill.

LAKE COUNTY.

COAL.—Lake Co. Bee, May 17: A correspondent writes, as follows: "I send you herewith a sample of coal discovered by Lake County, about 6 miles south of Lower Lake and 8 miles north of Harbin Springs. The vein was discovered by Nathan Smith, is about 2 ft. in width and has been traced on the surface for a distance of half a mile. It is about 2 1/2 miles from Seigler Springs, near the road between Glenbrook and Lower Lake. The coal is of the bituminous kind."

NEVADA COUNTY.

MINING ITEMS.—Grass Valley Union, May 14th: The Coe mine has struck it very rich. In the shaft there is a ledge about 2 1/2 ft. thick and the quartz is full of the best class of sulphurets and shows also splendidly in fact. The ledge is regular and well defined. The Pileocene Co., at Randolph, between Grass Valley and Rough and Ready, is panning out well. Last Monday \$150 worth of gold was taken out and on yesterday a partial clean up was made and \$80 realized. The bed of gravel is extensive and of course is rich to give such results. The expense of the mine (gravel) is about \$8 a cubic yard for labor. We congratulate Billy Coombs on the result of his persistent labor.

The Eureka made a shipment yesterday; to the amount of \$15,700, taken out of the amalgamators of the mill after running 12 days with 8 stamps.

NAPA COUNTY.

YELLOW JACKER.—Callista Tribune, May 15: This Co. now have a tunnel in 55 ft., and a shaft 24 ft. in depth. Some of the ore taken out is of marvelous richness, and the average quality is much above the first prospects. We have just heard of a rich and extensive coal discovery.

The discoverer is Mr. Nathan Smith, of Cobb Valley, and the mine is situated about 2 1/2 miles from Callista, 2 miles from Seigler Springs, and 5 miles from Harbin Springs. It is in a canon, with high mountains on each side, the coal being found in layers, or strata, a few ft. apart and running into the mountains on both sides of the canon. The first vein opened was but 1 inch thick at the surface, but on going in 4 ft. increased to 2 ft. in width. A gentleman from San Francisco, who has been many years in the coal business, states that it is equal in quality to any foreign coal, and will bring as high a price in the market as the best. It is the only coal yet found in California which can be used at the forge. The extent of the deposit is not yet known.

THE GREAT WESTERN.—This rich quicksilver mine (formerly the Gem) which is located about 14 miles from Callista, over St. Helena Mountain, has been worked with 30 hands for more than a year, and there is now sufficient ore on the ground to occupy 6 months or more in the working. The Co. are about erecting a furnace and the other necessary appliances for getting out the metal, the material for which, amounting to several hundred tons, is now passing through Callista.

NEVADA COUNTY.

BARS OF GOLD.—Grass Valley Union, May 13: The Idaho mine skinned the amalgamators of the mill, not touching the batteries, and got about \$23,500 worth of gold after a 6 days run. The Eureka made a run of 5 days with 10 stamps and got about \$9,000 worth of gold. The Pileocene Co., working in gravel, is taking out something like \$100 per day, with a labor account of not over \$15 a day.

A BIOCLEANUP.—Nevada Transcript, May 18: After a few days run the Nevada Transcript, on rock from their quartz mine on Little Deer Creek, they cleaned up on Friday last, \$10,000. A thousand dollars a day from an 8 stamp mill is not bad to take, especially when it costs so little to take out and crush rock as it does under the system of working their ledges adopted by the Murchies.

CANYON CREEK.—The new mill of the Canyon Creek mine of Lock & Curry is on the ground, and a part of the machinery has been set. It has two heavy batteries and 10 stamps. The mine can be opened by a tunnel from Canyon Creek to the depth of 1500 ft. without machinery.

PLUMAS COUNTY.

WATER RUNNING.—Plumas National, May 10: The Hungarian Hill Co. have finished their ditch to one of the branches of Mill Creek, and have about 100 inches of water running through it at the present time. This

with the aid of their reservoirs, will give them a "big lift" in the water line.

RICH QUARTZ.—Mr. Bell who is working on a quartz ledge near Elizabethtown, has shown us some splendid specimens of quartz, and we should not be surprised if he develops a valuable ledge.

STILL PANNING.—The old Dutch Hill claims continue to "pan." The Co. recently cleaned up 200 ounces for 30 days a run, working 8 men.

PLUMAS COUNTY.

NEW CLARKE.—Plumas National, May 17: Ferguson & Co. have commenced work on a new claim near Little Long Valley, which we are told, promises to be very valuable when fairly opened. Everything indicates a huge old channel, and the pen never fails to bring "the color."

INCREASING.—The water in the Hungarian Hill ditches is gradually increasing, and they now run their giants about 7 hours per day, and are making splendid pay.

PACER COUNTY.

CHIEF PLACER.—May 18: The shaft on which they are now working is down 214 ft., at the bottom of which the ledge is full 2 ft. thick, and shows free gold and sulphurets in greater abundance than any rock yet taken from the mine. For the first 150 ft. the ledge varies from 8 to 12 inches in thickness; from that point they commenced running levels and stopping the rock, the rock being literally interwoven with gold. At the depth of 175 ft. they struck a stringer about 6 inches thick, which is very rich; from that point down the ledge has continued to widen and grow richer. The Co. have now out about 70 tons and are crushing 17 tons a day at their mill.

GONNARD.—On Thursday we were shown some of the richest rock yet taken from the mine in this section, the rock being literally interwoven with gold. The specimens were taken out at a depth of 40 ft., and were on the pay chute. Out of about 150 pounds of the rock, crushed in a hand mortar, they have taken about \$1,500, and they have now out considerable rock that is equally as rich, while the ledge shows the same quality of ore on all sides.

TRINITY COUNTY.

COOPER ORE.—Trinity Journal, May 17: George Rose has discovered some very rich copper ore on the head of Brown's Creek. A small specimen shown us seems to be about two-thirds pure copper.

TUOLUMNE COUNTY.

HILL & MARSHALL.—Inyo Independent, May 17: Quartz at Cherokee continues to pan out well. From 25 tons of rock recently crushed, they realized 75 ounces—equal to \$1,200. They struck a chute of rock last week near 4 ft. wide, which prospects very fine; and have started a tunnel on the outside, which will give them 200 ft. below the surface.

GRAVEL.—A rich deposit has been discovered in the mountains near Helder's sawmill, Sugar Pine district, by Messrs. H. Brendt & Co. It is said to be the regular Table mountain washed gravel and cobble rock, and prospects all the way from one to two bits to the pan. Pieces of coarse gold weighing \$30 and upwards have been found in the diggings.

RAWLINS.—This Co. are getting up two 12-inch pumps, which with their horse power engine will be capable of draining the mine.

Rock from the Duckwell canon, near the Grizzly mine, is on exhibition at Jack Barry's. The vein is 18 inches, and the rock is liberally sprinkled with gold.

The Cordova mine, at Cherokee, looks well. Last week Mr. Prudhomme struck a chute of rock which was extremely rich.

The Table Mountain Blue Gravel Co. are taking out from 18 to 20 ounces of gold per day.

The Alpha is paying from \$2.50 to \$2.75 per car load. The car holds three-fourths of a ton.

Nevada.

BELMONT.

BELMONT.—Reese River Reville, May 17: This Co. is stopping out the finest ore that ever came out of their mines. This is coming out of the big chimney or 180-ft. level of the Canfield. They are still sinking the main incline, and the progress is as fast as three shifts of men can put it down.

ER. DORADO.—The mine claims to be the chief in producing large bodies of fine ore. The body of sulphurets ore north of the main incline seems a mystery to all observers. At the junction of the north chute with the 400-ft. level the breast of ore is over 10 ft. thick. Stopping has commenced at this point, and a 20-stamp mill of the Co. is running steadily on this sulphurets ore mixed with one-third of the Stetefeldt ore from the south body of the same level; the mixing of the different ores helping the reduction of each.

BULLION. The Belmont Co. shipped this morning \$13,350. This is the accumulation of the last 2 weeks. During the same period the El Dorado Co. have shipped \$18,927, making a total for this month of \$34,287.

CENTRAL DISTRICT.

NEWARK MILL.—Eureka Sentinel, May 17: This mine bids fair to become one of the richest mines in the Co. The incline is now down 270 ft. in the ledge, which shows an average width of 3 ft. We have been shown 5 assays taken from different parts of the mine which averaged somewhat over \$128 to the ton.

EUREKA DISTRICT.

NEWARK MILL.—Eureka Sentinel, May 15: We learn that the Newark mill will go into operation on or about the 1st proximo. There is an immense amount of fair grade ore in this section, and it is the opinion of competent judges that the mill when once started will be kept in constant operation. It is proposed to erect a new Stetefeldt furnace during the summer.

RICH ORE.—A prospector displayed some marvelously rich ore here a day or two ago, which he said was a new discovery, but he refused to designate the locality. One assay showed a value of \$2,000 per ton in silver.

BIG LOAD.—A single team, belonging to Pritchard, yesterday, loaded 60,000 pounds of hullion for Fallsdale.

ELY DISTRICT.

ALPA.—Pioche Record, May 11: A very rich body of ore, 2 ft. in width, has been struck on the 164 ft. level, and from 2 to 3 tons of high grade ore are being daily hoisted, with but a small force of men engaged.

We are glad to be able to chronicle the shipment by this Co. on the 9th inst., of 4 bars of fine bullion, valued at \$345, the proceeds of 39 tons of ore. This ore was worked at the Meadow Valley Mill, and great credit is certainly due to Mr. Maynard for working the ore up to so high a percentage.

MEADOW VALLEY.—Pioche Record, May 14: We yesterday spoke of the important strike on the 800-ft level of the Raymond & Ely mine, and we are now with equal positiveness, state that a strike equal to it in richness and extent has been made in No. 3 Meadow Valley. The ore body is many ft. in width, and the ore is all of high grade and much of it almost incredibly rich, and some of the assays reaching a thousand dollars and over to the ton.

CHIEF EAST.—The main shaft is now down 550 ft., showing a 2-ft. vein of ore which assays from \$200 to \$300 per ton. East from the 200-ft level a drift has been run about 40 ft., with an average vein of 18 inches in width—solid ore, and very high grade. The main shaft is still being sunk on the ledge, which keeps on improving a little in size and quality. Between 50 and 50 tons of high grade ore have been raised within the past two weeks.

RAYMOND AND ELY.—May 15. A fever of excitement was created in the city yesterday by the exhibition of large and numerous pieces of ore taken from the late great strike in the 800-ft. level. We have a specimen bearing no. 1, weighing probably 5 pounds, and it is the most beautiful of the kind we have seen, excepting the brilliant vari-colored ore from the Cave mine of Bristol district, we ever gazed upon. It is literally covered on one side with crystallized bromide, crystallized copper and bromide of silver, the whole give the exterior exactly the appearance of heavy green silk plush with indigo-

blue stripes running through it. The crystallizations characterize the ore throughout, wherever broken. Every part of the specimen is pronounced silver bearing, and experts say it will assay from one to five thousand dollars per ton. It seems almost incredible, but it is slated with great positiveness that the deposit from which these beautiful and wonderful rich specimens were taken is of immense extent, and seems to be equally rich throughout.

BOWEN.—Work was yesterday resumed on the mine with full forces, and will be prosecuted with all energy. The indications never looked more promising. Some of the richest ores in the district have been taken from this mine.

LONG VALLEY.—Parties visited us yesterday evening direct from Long Valley district, about 50 miles south of Pioche, on the Meadow Valley Wash. They give a very encouraging account of affairs down there. The main ledge are the Red Jacket, Green Monster and Good Hope, on all of which development is progressing. There is no doubt they are all on the same vein, a great, well defined fissure, being from 2 to 8 ft. between walls. Considerable ore is being brought to the surface, which is claimed to be high grade. There is an abundance of wood within four and water within five miles.

WASHOE.

ALAMO.—Gold Hill News, May 17: The ore gives good assays, which continue to improve as greater depth is attained.

AMERICAN FLAT.—This mine adjoins the Baltimore Co., and the Co. have contracted with the Baltimore for the privilege of working their mine through the shaft that Co. won the local level is fully opened.

ARIZONA AND UTAH.—Drift east for the ledge, progressing at the rate of 4 ft. per day, the rock hard, but blasting and working favorably. About 45 ft. yet to run in order to reach the ledge.

BALTIMORE CON.—Drifting south at the first or 225-ft. level, following the ore body. The ore-deposit of the upper level is 13 ft. wide where it was first cut through and the drift passing upward cut into an evident continuation of the same ore body. The lower face of the drift is in fine ore, and the whole distance from where the body was first cut into to the face of the drift, is about 27 ft. The unexpected finding of the ledge so soon at the lower level shows the ledge to lie at a much flatter angle than was calculated upon. Good ore being found at this point, also indicates that the ore body is continuous between the two levels—a distance of 250 ft., following the dip of the ledge.

BELOCHER.—Daily yield over 550 tons, equally proportioned from the 1,000, 1,100, 1,200, and 1,300 levels, the ore-breasts of which all look splendidly, those of the two lowest especially. The main incline is now down to the level of the bottom of the last level, the 1,300-ft. level, the drift is resumed in the main drifts at the 1,300-ft. level, the drift passing to the west of the ore body, and toward the incline.

BROCKEY.—Daily yield, 25 tons, milling a little over \$11 to the ton. No particular change in the ore producing sections.

CHOLAR.—Nothing new to report. Work going on as usual.

CHOLAR-PORTER.—Daily yield 150 tons from the old ore producing sections; average assays about \$34 per ton.

CON. VIRGINIA.—Slaking the main shaft and prospecting at the 1,167-ft. level going ahead as usual. No new developments.

CROWN POINT.—Daily yield 500 tons from the 1,100, 1,200 and 1,300-ft. levels. The ore stopes and breasts all continue looking and yielding finely, with no sign of giving out in any direction. The cross-cut east from the third floor above the 1,300-ft. level, 40 ft. from the Belcher line, is in good ore, but the face of the cross-cut from the 5th floor has run through into porphyry, which is thought to be the east wall. Drifting progress at this point, also indicates that the ore body for the 1,600-ft. level are ready for the opening of that level. The main incline is down about 10 ft. below the 1,500-ft. station.

CROWN POINT RAVINE.—The main drift at the 250-ft. level cut through the east wall of the ledge day before yesterday, 80 ft. from the shaft. Quartz of a very favorable character was found, but the same ore a heavy body of water was topped, which drove the workmen out.

DANEY.—New shaft down 93 ft. in good sinking ground. A contract is let for the next 100 ft., and another will soon be let for the removal of the hoisting works from the old shaft to this new one.

EMERALD.—This company has commenced sending ore up from the 1500-ft. level of their mine through the Imperial-Empire shaft—enough to keep the Douglas mill running.

GLOBE.—In the winze and raise to connect the old with the new works, very good progress is made considering the extreme heat and difficulty of ventilation.

GOUN & CURRY.—Sinking the incline and prospecting at the 10th and 11th levels progressing as usual, with nothing new to report.

GREEN.—This adjoins the Silver Hill on the south. It was first worked in 1860. A tunnel was run in a distance of 400 ft., with 3 branches, cutting several rich feeders, indicating a body of ore below. This induced the sinking of a shaft 200 ft. below the bottom of the tunnel, which struck a fine blue ledge of silver ore 8 or 10 ft. wide, giving average assays of from \$50 to \$60 per ton. The air being bad and the facilities for working poor and expensive, the company suspended operations. They now propose running another tunnel into the steep hill, which will strike the ledge considerably below the present workings.

GRAND NORTON.—Daily yield about 70 tons. The cross cutting, at the 1700-ft. level, shows improvement in the vein matter. The ore-producing sections hold out as well yet.

IMPERIAL.—The 1700-ft level shows improvement in prospects, but there is no change to report in the other levels.

JACK LITTLE.—Drifting ahead in the upper mine as usual, with most excellent prospects, the ore assaying as high as \$50 per ton. The company has succeeded in purchasing the old Manhattan, Bowen and Martin claims adjoining.

JUSTICE.—The main incline, south mine, is down 45 ft. below the second station, with the bottom working into quartz ore. The main south drift from the old Justice works is in 585 ft., with the face in favorable looking quartz and porphyry. The south mine continues yielding some good paying ore.

MINT.—The east main drift at the 75-ft level has just cut through another fine looking vein 3 ft. in width, pieces of which shown this morning will evidently assay rich.

NEVADA.—Sinking as before in the ore body, and taking out ore for milling as the prospecting is proceeded with.

OPERA.—Some improvement is noticeable in the material crosscut into from the raise from the first level of the north mine, otherwise there is no change to report. Sinking the shaft from the 455-ft level progressing well.

PHIL. SHERIDAN.—This mine situated on Cedar Hill between the Utah and Sierra Nevada, is one of the most promising locations on the north section of the old Comstock. A tunnel has been run 400 ft. in length, which, after passing through one vein of gold and silver bearing quartz 3 or 4 ft. in width, terminates in a large body of the same. An incline following into it goes a distance, and a shaft sunk 90 ft. failed to develop its extent. From the bottom of this shaft a drift was run 50 west and an incline commenced in the ledge, but encountering considerable water, it had to be abandoned. Enough work has been done to ascertain that a large vein of very promising quartz exists there, which assays from \$15 to \$30 and upwards to the ton in gold and silver.

SILVER NEVADA.—The mine shows some improvement in its northern ore sections, and the mill is kept steadily running as usual.

SILVER HILL.—Keeping the Bacon mill steadily running, with plenty of ore in sight. The north portion of

[Continued on Page 324.]

Postal Cards.

The Third Assistant Postmaster-General, has given notice that the necessary appropriation having been made for the purpose, the Department would on the 1st of May commence the issue to Postmasters of the postal cards authorized by the Act of June 8, 1872.

Postal cards will be sold for one cent each. An ordinary printed business card may be sent through the mails when prepaid by a 1 cent postage stamp attached; but such card must contain absolutely no written matter except the address, otherwise it will be treated as not fully prepaid, and refused admission into the mails. The postal cards are 3x5 inches in size, with one side blank for writing purposes.

All cards different from those herein described bearing embossed or printed postage stamps, and purporting to be United States postal cards, are counterfeit; and the manufacturer of such cards or the attempt to use the same, will subject the offender to a fine of \$500 and imprisonment for five years. (Sec. 178 Postal Code).

Postmasters will not, under any circumstances, be permitted to reduce or exchange postal cards that may be misdirected, spoiled in printing, or otherwise rendered unfit for use, in the hands of private holders.

Artesian Wells—Government Work.

Artesian wells are of comparatively recent origin. They flow with a constant stream, and the fountain of water is a subterranean river or lake, upon which a pressure rests sufficient to force water to the surface. It seems certain that the force is in a lake, for these wells are obtained over a greater width of country than any river. Usually the water is nearly soft; some times it is of a mineral character, like that at Sarstoga.

In Northern Illinois are many artesian wells, and some have a bore so large that water power is afforded, as at Chicago. The depth of these wells varies. In Iriquois County they are from 75 to 100 feet deep, and when tubed above the ground the water rises 20 or 30 feet, furnishing an unvarying supply whether the weather is wet or dry, hot or cold. In other places the depth is great, sometimes 1,000 and 1,500 feet. One well, at St. Louis, built for a sugar refinery, is, we think, over 1,200 feet deep, and the supply is constant and the quality excellent.

This is a subject of national importance. There are six Territories in the interior which cover an extent of 360,000,000 acres of land, and the quality of the soil is excellent, but as no rain falls, so to speak, this land is worthless. It is true that remarkably fine crops are grown by irrigation, but probably not more than 10,000,000 acres can be covered with water. A considerable portion is mountainous, but it is fair to estimate that there remains not less than 200,000,000 acres of excellent land which would support a dense population could it be irrigated.

That artesian wells can be obtained in this region there is every reason to suppose, but the expense of the undertaking is too great for private means, and some wise men hold that this is proper work for the Government, and that it might appropriately be assumed by the Department of Agriculture, especially so for the reason that the abolition of the Franchising Privilege destroys the book-making and seed business.

We are happy to announce that Government has appropriated \$10,000 toward sinking an artesian well at Fort Russell, Wyoming, as a military measure, and work is now progressing. As the location is on an elevated plateau, 6,000 feet above the sea level, water may not be obtained as cheaply as at other points. All such experiments on the plains should certainly be made where there are fewest difficulties, and where the prospects are most favorable.

Should the money be expended at Fort Russell before water is reached, Congress should promptly vote more money, that a full demonstration may be had. Boring commenced at Denver, Colorado, some years ago, by private parties, but, after going down some 600 feet, the funds were exhausted and work stopped; but water rose to within 20 feet of the surface. The location is on a high piece of ground overlooking the city. Recently more money has been subscribed, and work has been resumed. —N. Y. Tribune.

RAILROAD IN SANTA CRUZ.—The *Sentinel* says: "We are enabled to announce that there is a fair prospect that the railroad (narrow gauge) will be built, not only entirely through the county, along the coast, but in a brief time to San Francisco. The only thing that can prevent this is treachery on the part of interested parties or of a failure to secure the subsidy and amount already subscribed or promised. The subsidy amounts to—at 41 miles of road—\$252,000, and over \$120,000 have already been subscribed or promised by reliable firms for the road. There remains to be taken, in stock, only \$40,000, of which some have been promised, and many small subscriptions have or will be doubled to make up the deficit. Major R. P. Hammond, an old and experienced railroad man, will offer to build the road for the subsidy and \$50,000 worth of additional stock subscribed. This plan is a good one, provided the stock could be secured. The result would be a wide gauge road, and for the present only to Santa Cruz. We could then go on and build a narrow gauge up the San Lorenzo Creek, and along the coast to our county line, at our leisure, and as convenience or necessity dictated.

Four Valuable Oil Plants.

The three grand kingdoms of nature are all of them largely oil-producing. The earth has its fountains of kerosene, the animal world is full of oil, whilst trees and plants or the vegetable kingdom, yields its full quota, and all for the illumination, lubrication or sustenance of the world. We herewith present miniature engravings of a few of the plants yielding oils.

in the culture of turnips, and raised solely for their value as an oil-yielding plant. The seeds are perfected as with the turnip family, the second year of their growth. The oil is extensively used for machinery and for burning in light-house lamps. The refuse-oil is a well known cattle food.

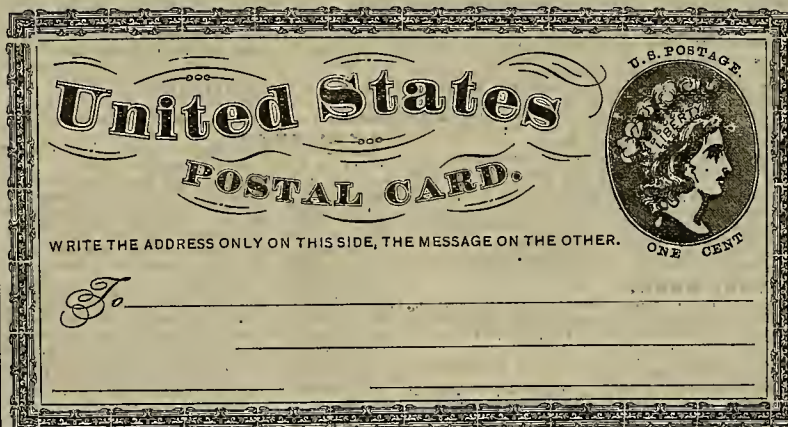
Fig. 3 is the common pea-nut so well known as to need no description here, where the plant and its culture is so well understood. It was



OIL PLANTS.

Fig. 1 is the well known olive that even far back into the times of scriptural history was a celebrated fruit, used as a condiment, or its expressed oil as an agreeable and wholesome food in itself. It is among the oldest of cultivated fruits of which we have any account; so

originally from Africa, but is now found and cultivated in all warm countries. The fruit, though valuable as an article of food and everywhere eaten, is more valuable for the oil it contains, being good for every purpose for which olive or almond oil is used, and is very fre-



old indeed that its native country is not positively known. The tree is seldom more than twenty feet in height in European countries, is of a spreading habit, easily cultivated and very long lived.

Fig. 2 is the *Brassica Napus*, from the seeds of which—and other species of *Brassica*, all natives of Europe—is expressed an oil known as Rape seed or Colza oil. The plants are extensively cultivated in the manner usually adopted

quently substituted for the former, and very largely used in its stead. In many parts of India it is sold as pure olive oil, and for all alimentary purposes is quite as good.

It is said to keep a long time without becoming rancid, and the nut grown in a California climate, yields more oil than when grown under a less favorable one. The trade both in the nuts and the oil, is very large and rapidly increasing, and is extensively distributed over

the globe. In many places the nuts when roasted and ground are used as chocolate, and are said to make an excellent substitute for that beverage.

Fig. 4. This is the well known Castor oil plant, *Ricinus Communis*, a native of India, but now widely distributed and cultivated in various parts of the world, but nowhere more successfully than in this country. The uses to which this oil is applied are constantly increasing, and its consumption very great. In tropical countries the *Ricinus* grows to a tree-like size, while in temperate climates it is an annual. It is already somewhat extensively cultivated in California, and is destined to hold considerable rank among our exports at no very distant day.

Mexican Mines.

In a late letter a correspondent of the *Bulletin* mentions that a company had been formed in Mazatlan, to work the rich silver mines of the mountain ridges. He says: If we consider the splendid returns of the mining districts of Topia, Tominil, Guadalupe de Los Reyes, Birimoa and Metatitos, and the greater facilities we have now of extracting and reducing the ore, it must strike everybody that a country which yielded at the time of the Spaniards no less than 2,000,000 of silver from its mines, should be reduced now to the most abject poverty. Under the colonial system commerce was a monopoly, agriculture barely enough for home consumption and industrial pursuits entirely unknown, while the working of the mines was at least twice as expensive as now. And, nevertheless, Mexico sent annually twelve millions of dollars to Havana (wanted there to cover the financial budget) and the galliots laden with precious metals went from Vera Cruz to Cadiz and Acapulco to Manila.

The Republic tried to patronize home manufacture, and only succeeded in providing the common people with a coarse fabric made from cotton raised in Durango, Chihuahua, Coahuila, Vera Cruz and Mexico, producing too costly a raw material to compete with foreign markets. Our forests abound in dyewoods, cedar, mahogany, and other precious woods, but they can only be exported when cut close to the beach, and the orchilla gathered in Lower California has become a drug in the market because freights are now too high to export the same with advantage. Indigo and cochineal, which used to be staple articles of this soil, are scarcely asked for, and only of limited consumption since the chemical arts have discovered other and cheaper materials to furnish the same colors.

Thus Mexico, with all its immense natural wealth, is actually now without resources, and will remain so, if the men of capital continue to remit their funds to Europe, instead of promoting mining, which, under present circumstances, promises better returns than ever before. There is now a machine-shop in this city. We are able to get all the needed materials from your port, and with but little delay the exportation of ores is given free; advances can be got on shipments to Europe, and thus everything speaks in favor of the said branch of industry as the only one to re-elevate this Republic and furnish the means to build railroads, which latter must double its productive-ness.

A correspondent of the *Alta* writing from the City of Mexico

says: To create a more general welfare, steps have been taken in the right direction by fostering mining, the only industry to which the Americans have a natural inclination, offering all the excitement of gambling. The Mexican is a gambler by nature from the cradle to the grave, and from the *albur* of monte to the noble game of chess. You will find at San Augustine the monte-stakes from the copper *staco* to the pile of thousands of ounces, and at the Chess Exchange each game played for a consideration, from a cup of coffee to ten or more gold ounces, with numerous blankets if the players belong to the champion ring.

In every part of the country new mines have been taken up, or companies formed to work those which had to be abandoned at the expulsion of the Spaniards in 1823. The late prohibition of all chance games in public, has done a good deal to favor mining, and even a stock exchange has now been established here for this kind of gambling, though much quieter than at San Francisco, and certainly on a much more solid footing, because the price of a share, or a barra, (the 24th part of mine) does not depend on the caprice of the manager, but of its real productiveness.

Stock Quotations.

As a curiosity, I shall give you the latest quotations of our principal stocks: Real del Monte Pachuca, \$1,250 per share; Providencia, \$4,000 per barra; El Puente (Guanajuato), \$8,000 do; Arrevalo (chico) \$10,000 do; Maravillas, San Enguino, \$40,000 do; Bonanza, \$10,000 do; Nuevo Rosario, \$4,000 do; Lobo (Guanajuato) \$3,000 do; Guatemotzin, 75,000 do, and numerous others, at lower rates, besides those which are entirely in private hands.

Many mines had to suspend their works on account of the want of quicksilver, the Mexican cinibar mines yielding but little, and the importations from the old and new Almaden having decreased considerably.

USEFUL INFORMATION.

The Use of Spectacles.

Eyes are not uniform in shape or size. Wonderful in their mechanism and for the purposes for which they are intended, yet they are so often imperfect as to demand both care and assistance.

As there are long, short, lean and fat persons, so there are fit, round, small and large eyes, and each eye as natural to its possessor as his size or weight is to an individual. With a knowledge of these facts, Ophthalmologists have arbitrarily created a standard, or model eye, based upon its power of refraction.

Eyes in a passive state have a common refractive power relative to the individual; and they also have; more or less, a faculty of increasing the common refraction and restoring the eye again to its passive condition.

The measure of perfection in the eyes is their capacity to focus upon the retina, parallel rays. (All rays coming from objects fifteen feet or more distant from the eye, and which enter the pupil, are practically parallel.) All other things being equal, objects at fifteen feet or more distant from the eye, if seen at an angle of five minutes, are distinctly seen without blur, sharp in outline, clearly defined on their borders, by the emmetropic eye in its passive condition.

If objects are nearer than fifteen feet to the eye, their reflected rays are so divergent that the perfect eye cannot focus the rays upon the retina, and the faculty of increasing the refractive power of the eye is brought into requisition. This faculty is called the accommodation of the eye. The nearer an object is to the eye, the more will the entering rays diverge, and of course the greater must be the tax upon the accommodation.

In the model, or perfect eye, this power is taxed to its utmost, and fails to serve us if the object is brought nearer than six or eight inches to the eye. If we persist and bring the object nearer than the accommodation permits, circles of dispersion form on the retina and vision is blurred.

There are several media in the eye through which light passes to the retina, and each medium has its own power of refraction, but the measure of the common refraction of the model eye is the mean of the sum of all the refractions.

The crystalline lens is one, and the most important, refractive medium. By a change in the shape of the lens the faculty of accommodation is manifested. This is accomplished by a small muscle which surrounds its border and thickens it to increase its power to focus divergent rays.

The greater the divergence of rays which enter the eye, the more will they diffuse upon the retina and produce a blur, unless some means are provided to focus them. The lens does this, and the greater the divergence, the thicker must be the lens.

It is still an open question whether the little muscle (ciliary,) or the elasticity of the lens, or some other force, flattens the lens to fit for parallel rays.

It is necessary for good vision, without artificial aid, to have all the conditions herein stated work harmoniously together and singly without fault—in truth, there are four conditions—the integrity of which is essential to insure perfect vision. For any and all the anomalies of these conditions, spectacles, if properly adapted to the need, become important and valuable servants.

First.—Objects must give sufficient light to produce an impression on the retina. Second.—The media through which light is transmitted, either in or out of the eye must be purely transparent. Third.—Both the refraction and accommodation of the eye must be without fault. Fourth.—The retina, to receive impressions, the optic nerve to transmit them, the brain to comprehend them, must be one and all be healthy. —W. W. Chandler, M. D.

A NEW USE FOR CORN.—A friend, to his great chagrin, purchased a pair of boots that were decidedly too small to wear, without great suffering. He had soiled the soles so he could not exchange and could not get them to the shoemaker. He thought of trying a new power on them. He filled the feet and part of the legs with dry corn, filled up with water, let them remain till the corn swelled fully; then rubbed the leather with curriers' "daubing," and they were ever afterward perfectly easy. Ordinary grafting wax, somewhat softened with lard, answers the same purpose. Here was the application of a very simple but efficient agent to stretching boots, and can be done at little cost and at home.

YANKEE IMPLEMENTS FOR JOHN BULL.—We have formerly alluded to the superiority of American agricultural tools to those which we saw in use and on sale in England. It is gratifying to learn that John Bull is beginning to open his eyes to the fact that Brother Jonathan is in advance of him in the manufacture of these and other implements. We see it stated that Philadelphia is sending hay-forks, dung-forks, and pitch-forks to Sheffield—which seems at first "very like" sending coals to Newcastle—while the Ames shovels from Massachusetts supply England and the rest of the world. Now that the tide has once turned, we may expect that the eastward current will soon become a strong one.

Land-Locked Salmon.

We find in a recent number of the *Concord Monitor* the following account of the successful breeding of land-locked salmon:

"Dr. Fletcher planted some eggs of the land-locked salmon in a small spring, under the bluffs on the other side of the river, a few weeks since. Within the past week they have commenced to hatch. On Tuesday he removed 85 to another compartment of the spring, and to-day he removed 31 more, which he had hatched within twenty-four hours. They came into the world provisioned with a month's rations, in the shape of the yolk of the egg which is attached to them. They were not injured by their journey from the British Provinces."

The land-locked salmon, which are found, we believe, in only two or three rivers of the continent, have no equal as a game fish, except the great salmon. They are found in perfection in the Grand Lake Stream, which is a connecting link in the chain of lakes in which the St. Croix River rises. Their average weight is a little less than three pounds, and they give rare sport to the disciples of old Isaac Walton, who cares to go so far as the eastern boundary of Maine. If they can be domesticated in our rivers, as good authorities believe, it will give a new pleasure to many an honest angler.

SENDING LIVE FISH BY MAIL.—Five living sea fish were recently sent by mail from Naples to London, the journey consuming a little over four days. The fish were each about two inches in length, and were packed in damp sea-weed, from which all but one came out in good condition, and, soon after being placed in their natural element, became as lively as ever.

A TOUGH THING TO SWALLOW.—Prof. Voght records an instance of what may be called self-cannibalism. He cut in two a male cricket, and immediately the fore part, probably experiencing a sensation of emptiness in the ventral region, turned upon the hinder part and devoured it!

FORCE REQUIRED TO BURST A BARREL.—A well-made barrel with $\frac{3}{4}$ inch staves, and 1 to $1\frac{1}{2}$ inches heads, of 28 to 32 gallons capacity, will bear 12 to 15 pounds of steam pressure, and from 45 to 48 gallons capacity, from 10 to 12 pounds. Strength is given mainly by thickness of head, which generally bulges out. Hoops, if good, rarely burst.

GOOD HEALTH.

Remedies for a Cold.

A distinguished physician across the Atlantic used to tell his class that there was no more certain remedy for a "cold in the head" than absolute abstinence, for from twenty-four to thirty-six hours, from every form of liquid, and if the suggestion be strictly followed it is good. We have tried it and know. But it requires some degree of moral courage. It is, however, well adapted to professional men who are liable to be called at even the most inconvenient times from a warm bed.

Another eminent physician, Dr. Dobell, says that colds can be stopped without lying in bed, staying at home, or in any way interfering with business—provided the treatment be begun directly the first signs of catarrh show themselves in the nose, eyes, throat, or chest. When the cold has become established it will not answer. The treatment is as follows: 1. Give five grains of sesqui-carbonate of ammonia and five minims of liquor morphia in an ounce of almond emulsion every three hours. 2. At night give an ounce and a half of liquor ammonia acetatis in a tumbler of cold water, after the patient has got into bed and been covered up with several extra blankets; cold water to be drunk freely during the night should the patient be thirsty. 3. In the morning the extra blankets should be removed so as to allow the skin to cool down before getting up. 4. Let him get up as usual and take his usual diet, but continue the ammonia and morphia mixture every four hours. 5. At bedtime the second night give a colocynth pill. No more than twelve doses of the mixture from first to last need be taken, as a rule; but should the catarrh seem disposed to come back after leaving off the medicine for a day, another six doses may be taken and another pill. During the treatment the patient should live a little better than usual, and on leaving it off should take an extra glass of wine for a day or two.

SMALL DOSES.—French medical journals publish the result of experiments to determine how minute a dose of poison will produce decided medicinal effects. The blood of an ox which had been dead ten days was used in the test. Having inoculated a rabbit with this blood poison, the doctor took the blood of that rabbit, and so on to the 25th generation that had died. The result proved that the one-trillionth part of a drop of decayed blood injected subdermally, sufficed to poison a rabbit. From this proving, dissecting surgeons are cautioned that, though the dissecting knife may be clean to the eye, it may yet hold an invisible atom of death poison, sufficient to infect the circulation if the operator should by accident prick his finger.

A French savant says that such results ought to open our eyes to the possible effects of minute doses in homoeopathy.

Ingrowing Toe-Nails.

A correspondent of the *British Medical Journal* takes the ground that no cutting operation is at all necessary for the complete and rapid cure of ingrowing toe-nails. If a small, thin, flat piece of silver plate be bent at one edge into a slight deep groove, and, after the toe has been poulticed twenty-four hours, slip beneath the edge of the nail, so as to protect the flesh from its pressure, and the rest of the thin plate bent round the side and front of the toe, being kept in position with a small portion of resin plaster passed round the toe, a speedy and almost painless cure will take place; and the patient, after the first day, has the additional advantage of being able to walk. This method has been followed in numerous cases with uniform success.

Dr. Blower, of Liverpool, states, in the same journal, that he has, for the past twenty years, employed compressed sponge successfully in the treatment of ingrowing nails. He renders the sponge compact by wetting and then tying it tightly, until it is thoroughly dry. A bit of the sponge, in size less than a grain of rice, is placed under the nail, and secured by strips of adhesive plaster. In this way, the point of the nail is kept up from the toe until the surrounding soft parts are restored to their normal condition by appropriate means.

CURING DISCHARGE FROM THE EARS.—As the cause of such trouble is always constitutional, local applications are of no benefit, and besides may be dangerous for the delicate organs of hearing. Many a patient has become deaf by a treatment which was recommended with the best intentions. The causes may be manifold, a hereditary taint, want of exercise in the open fresh air, sleeping in an ill-ventilated bedroom, improper food, injudicious diet, use of stimulants, indulgence in exhausting passions, vicious habits, etc. It must not be lost sight of that conditions differ, and that what will not harm one man except in later life, will at once affect others. The cure is evident; take out-of-door exercise, sleep with your windows open, only take care not to catch cold in a draft, watch your digestion, and eat only what agrees with you, but indulge in variety of food use no tobacco or liquor of any kind, but if necessary some mild cathartic, and add to this the daily use of some blood purifying decoction of sarsaparilla, assafras, or its equivalent, and—mercy, if you have no wife. Remember that married men are in general healthier and live longer than bachelors. Life insurance companies understand this.—*Manufacturer.*

PHENOMENA OF THE BRAIN.—One of the most inconceivable things in the nature of the brain is that although the organ of sensation, it should itself be insensible. To cut the brain gives no pain; yet in the brain resides the power of feeling pain in any part of the body. If the nerve which leads to it from the injured part be divided, we become instantly unconscious of suffering. It is only by communication with the brain that any kind of sensation is produced; yet the organ is itself insensible. But there is a circumstance more wonderful still. A certain portion of the brain itself may be removed without destroying life. The animal lives and performs all those functions which are necessary to simple vitality, but it has no longer a mind. It cannot think or feel. It requires that the food should be pushed into its stomach; once there it is digested, and the animal will even thrive and grow fat. We infer, therefore, that a part of the brain is simply intended for the exercise of the intellectual faculties, whether of the lower degree, called instinct, or of that exalted kind bestowed on man, called reason.

HOW TO KEEP TEETH IN GOOD CONDITION.—After each meal use soft, wooden tooth-picks, working the tips into fine brushes—then rinse the mouth with water. All that is required to preserve and beautify the teeth, is simple cleanliness.

Ordinary tooth-brushes do not reach the interstices and cavities thoroughly; and, besides, irritate and loosen the gums. Tooth-powder (of every kind without exception) is more or less injurious to the enamel.

The plan recommended is in vogue among the Arabs and Hindoos, both races being celebrated for their splendid teeth (in spite of their odious fashion of tinting them). A friend, who has followed this course for two years speaks very highly of it.

VITAL STATISTICS.—Items of vital statistics recently published in Europe go to confirm the received opinion that the duration of human life is longer than in past centuries. In the city of Geneva, Switzerland, registers have been kept of the yearly average of human life since 1590. In that year it was twenty-two years and six months. At present it is over forty years. The tables compiled by life assurance companies in England, and adopted in this country, show a similar result. In the fourteenth century the average annual mortality in the city of Paris was one in sixteen. It is now about one in thirty-two. In all England in 1690 the rate of mortality was one in thirty-three. Now it is about one in forty-two.

FRECKLES.—The *Druggist Circular* says:—"For the benefit of young persons afflicted with freckles, we would inform them that powdered nitre, moistened with water, applied to the face night and morning, will soon remove all traces of them."

MISCELLANEOUS.

How to Make a Coat.

A lady correspondent of the *Rural New Yorker* gives suggestions that may be useful to our readers remote from tailors or tailoresses, or who from motives of economy desire to do what this lady did. She says:

Having recently cut and made an overcoat, I thought how many women would like to know how to make this garment, as the tailoress does not go around sewing in families as she formerly did. How many boys in stormy weather might learn to make their own clothes on a sewing machine, if they had printed directions in their weekly paper for doing this. We cannot prize those papers too highly that teach us how to do useful work, that all may know how to obtain an honest living, and be useful instead of idle.

Having cut the coat, commence and sew up all the seams except those that join the fronts to the back, and press them. Fit the openings in the canvas to those in the outside; then close the openings with an overstitch over a strip of linen an inch in width; then prepare a double strip of linen, an inch in width, and fasten it to the canvas under the thread-marks for the buttons, with a semi-cross stitch; then carefully overstitch the canvas to the lappel on the body of the coat; then dampen and press and baste the whole canvas to the outside, so as not to cramp it. Then mark and cut the pocket-hole, and insert the pockets, with another coat before you as a guide, then sew the seam in the back of the lining, baste the wadding on the wrong side, and some thin cloth over the wadding to come next to the outside of the coat; quilt this lining according to your fancy, and baste the outside to it. In basting, lay down the lining and place the outside over it so as not to get the lining too close fitting for the outside. Baste the wadding to the front lining with thin cloth between them and the outside, and quilt. Then sew up the seams in the outside that join the fronts to the back and press them; then sew these seams and the lining together, having the front of the lining come under the facings smoothly; baste and sew down the facing, then join the shoulder seams; press and face the inside seams one upon another. Face the sleeves at the hand and sew them in; have the outside or only seam half-way between the seams of the back, and the fullness begin two inches in front of the shoulder seam, and continue to within three inches of the middle of the sleeve; then press this seam on the round end of the press-board; then press the canvas if necessary, and baste with small stitches to the seam of the coat and hem the sleeve-lining to it; then hem the linings on the hand-facings; then baste the stiffening to the lower side of the collar; stitch the lower part in straight lines; then over-stitch on the canvas side the part that turns over; then press and break the collar to its proper shape; then over-baste the cover to the break; baste all around, turn in and hem the collar to it; sew the underside of the collar to the outside of the coat; press, fasten the lining to it, and hem down the cover; stitch around the coat and cut the button-holes, and work them over a cord of linen thread, four double; press and sew on the buttons and a loop at the back on the inside, and hang it up.

TO MAKE A FISH OMELETTE.—There is two ways of making these; one is merely to flake some ready-cooked fish—cold salt cod is very suitable—season it with cayenne, nutmeg, and white pepper; mix it well with six beaten eggs and one dessert spoonful of cream or milk; fry it on one side only, fold it, and serve. The other method of making an omelette is as follows: Chop up what cold fish you have, add a little parsley and shallot shred emell, and a piece of fresh butter and some lemon juice. Place this in an oven to get hot; then beat six eggs, season them, and pour them into a buttered frying pan; put it over the fire, and as the eggs begin to turn opaque, lay the warm fish in the middle of them; roll in the ends of the omelette so as to enclose the contents, and capsize it upon a dish. Garnish with crisped parsley.—*Ohio Journal.*

TO POLISH TINS.—First rub your tins with a damp cloth; then take dry flour and rub it on with your hands; afterwards take an old newspaper and rub the flour off, and the tins will shine as well as if half an hour had been spent rubbing them with brick dust or powder, which spoils the hands.

A BRICK CLEANING MACHINE.—The immense amount of labor required to clean by hand the brick after the great fires at Chicago and Boston, have set inventors to work to devise some means by which such labor may be more cheaply accomplished by machinery. It is now said that a device has at last been invented that will do that work, and that one of the machines has been built and set to work in Boston. The bricks are cleaned at the rate of 35 to 40 a minute, one man being required to feed the machine. The work is also said to be done better and with less injury to the bricks than when it is done by hand work.

NICKEL is to come into general use as a facing for printing type. It is much cheaper and much harder than copper, and makes a better surface every way. The application is one of the discoveries of 1872.

MINING SCIENTIFIC PRESS

W. B. EWER..... SENIOR EDITOR

DEWEY & CO., Publishers.

A. T. DEWEY, GEO. M. STROGO,
W. B. EWER, JNO. L. BOONE.

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Saturday Morning, May 24, 1873.
San Francisco.

Legal Tender Rates.—S. F., Thurs., May 22.—buying 85%; selling 85%.

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Coz, the banker and broker, now known as the "Boston Swindler" was connected with the big diamond swindle, as appears from letters and plane found among his papers. He also owned \$106,000 worth of stock in a Copper Mining Company.

NEW HOISTING WORKS will shortly be put up on several mines in Pioche. The Raymond & Ely and Meadow Valley Companies in particular, will soon make important improvements in this respect.

THE GERMANIA SMELTING WORKS, near Salt Lake City, produced over 500 tons of pure lead in April end are expected to turn out 1,000 tons this month.

MINING SALE.—The Silver Hill Mine, Utah, has been sold to some New-Yorkers for \$29,700 and smelting furnace capable of reducing 60 tons per day will be erected at once.

DISCOVERIES of rich silver veins from Four-mile creek, north and west of Sugar Loaf mountain, in the vicinity of the Old Pay lode, Boulder district, Colorado, are reported.

PLACER MINING has commenced in earnest in Montana, and those who have not yet begun to work are making active preparations to do so.

THE Smelting works of the Rocky Mountain Smelting Company in Utah, will be in operation in a few days.

A MICHIGAN COMPANY are going to put up a large quartz mill at Farley's Park.

IRON ore has been found in Marion County, Oregon.

Failure of the Arctic Expedition.

Poor Captain Hall! After all his adventures, troubles and hardships he had to pass to another world without gaining that great object of his life, which was to reach the North Pole. The Polar Expedition was a failure and Captain Hall lost his life. It was believed that this expedition would explore further into the mysteries of the North than any of its numerous predecessors. Dr. Hays, the well known Arctic explorer, expresses an opinion that the vessel was unfit for the service, and the injury done to her was caused by defects in her build. He thinks Captain Hall has done a glorious thing and proved that Smith Sound was navigable and was the true passage to the Open Polar sea, that great goal of all Arctic explorers. He went further north with his ship than any human being ever did before him, although others have gone as far in sledges. Dr. Hays thinks it very strange that Captain Hall died in that region of apoplexy and thinks there is a bad look about the whole affair. The men who deserted, probably, did so because of Hall's death. Nineteen of the survivors of the Expedition have returned. This party, who had been landed from the Polarie were driven from her by a gale which burst her mornings on the 15th of October, 1872 in latitude 72° 35'. When last seen the Polarie was under steam and canvas, making for the harbor on the eastside of Northumberland Island. They had no more boats left. The opinion of the survivors is that the Polarie will not be able to get steam until the coming July.

Captain Hall died on the 8th of November, 1871, of apoplexy, in latitude 81° 38' longitude 71° 44', just after he had returned from the northern ledge expedition by which he attained a latitude of 82° 16'. He was in his usual health, but when he called the crew into the cabin to encourage them to renewed exertion he was taken ill. The Polarie entered winter quarters in September, 1871, and left August 12th, 1872. The sledge party crossed Kene's Open Polar Sea which they pronounced to be a strait about 15 miles wide, with an appearance of open water to the north. The party who left the Polarie suffered very much from exposure but were fortunately met by the Tigress and carried safely to St. John. An investigation will be held in relation to the disaster, and if necessary, a vessel will be ordered to Baffins Bay to look out for the Polarie. The failure of the Expedition is widely deplored as its success would have been attended with beneficial results. A package has been found which Captain Hall left behind him to be opened in case of accident, which contains valuable notes and memorandum with regard to the Arctic Regions. The notes are in the form of a journal and will probably be published.

If we are to judge by the despatches from New York in relation to the subject, there was some foul play going on aboard the Polarie. Joe, the Esquimaux who was with Capt. Hall on the sled trip, gives evidence to the effect that he thinks Captain Hall was poisoned. He says Captain Hall was well when he came on board, and was taken sick soon after drinking some coffee, which tasted strangely. Hans Christian's story is to the same effect. Capt. Tyson and Mr. Meyers are said to be in possession of information which they are unwilling to communicate, but which will doubtless become public shortly. The Esquimaux, Joe, states that Hall himself believed that he had been poisoned. The prevailing impression among the unfortunate nineteen persons who were left in the ice, was that Buddington, the sailing master, had willfully abandoned them to their fate. Captain Tyson thinks the ill-feeling and bad designs of Buddington and a few others of his accomplices had continued from the first. It seems that Buddington ruled the ship after Captain Hall's death, and there was then neither law or system on board. It is probable that the whole truth of the matter will be made public at the proposed investigation.

THE Chrome ore lead in Cow Creek, Oregon, has been leased for a term of years to a party of capitalists who intend reducing the ore at the mine. Improved machinery is to be purchased.

THE LAROE FIRE in the neighborhood of Puget Sound are creating the smoky atmosphere so much complained of that vicinity and along the coast.

The Comstock Mines.

Latest Home Views by Our Virginia Correspondent.

NUMBER II.

Washoe,—the world-wide appellation of early days, so significant to all pioneers—those bloated aristocrats who carried their millions about in their pockets in the shape of stock certificates; confiding adventurers, who, like California '49-ers, in the excitement attending the acquirement of suddenly-found wealth, trusted, thoughtlessly, that the flush times would last forever, but who in the grand collapse of '63 and '64, having neglected to realize, sew their hopes, their fortunes (and in many cases their "sacred honor") dwindle away like morning mist, leaving them but one alternative, to "stare fate in the face" and commence life anew,—a name comprehensive in its application, including at that time all the mines of Nevada, irrespective of location (as Boston is said to include all Massachusetts),—the name Washoe popularly signifying great expectations and blighted hopes, with the advance of time, the change in population and ideas, and the concentration of capital mainly to the developing of and speculation in legitimate and reliable mines, is gradually dying out and giving place to the more sectional name, Comstock.

The Name Comstock.

However, covers an extended area. The limits of this vast lode will probably not be defined by the present generation, for, notwithstanding the astonishing amount of prospecting thus far, its continuation north of the Ophir and south of the Overman is still a matter of speculation, and the uncertainty in this respect is universally welcomed by ambitious locators; outside of these limits nearly all mines for miles in this vicinity complacently flatter themselves as being located on the genuine Comstock. It will be many years before the numerous theories advanced in regard to the continuation of this lead can be possibly established or contradicted. North of the Ophir there are three claimed extensions of the ledge, and south of the Overman the proposition is equally undecided, but the general supposition is that in this vicinity the ledge branches off to the S. E. and S. W., both of which theories have good foundations.

Having described the prominent locations on the supposed east branch as far as Devil's Gate, in previous letter, justified to the

Western Line of Claims

Will necessitate returning to the grand junction of the two southern forks of the lead which thus far appear to concentrate in the gigantic deposit of Crown Point and Belcher.

The first in line in active operation is Caledonia.

The old original North American, by taking in the old Caledonia Tunnel, claiming a number of blind ledges, changed its name to Caledonia S. M. Co., in order to regain its former position on the stock Board, from which it had been erased through the chicanery of its manipulators. The Sapphire Mill is running on low grade ore from this mine, which is taken from the 400 ft. of ground now in dispute for possession by the Overman Co. Their 400 ft level has proved a failure, so far.

Prospects on their lower level are reported favorable.

The Knickerbocker

Is a back location of 1,200 ft., and have a pet for their ground. They have, however, deserted their old ground, and gone 1,000 ft. or more east, where their shaft is now located.

Should they be successful in finding ore from this point it will immediately be claimed either by the Caledonia or Baltimore Consolidated.

South and west of the Knickerbocker Works, on the line of the American Flat road, lies a section, which, judging from the events of the past few weeks, bide fair to become a nucleus for extensive speculation and work in the future. The ground is covered with locations and counter-locations lying in every conceivable shape and direction, which for the past few years have not received much attention, and, with a few exceptions, have been, for the time, deserted. The late strike in Baltimore Consolidated has suddenly awakened in the minds of the owners of these forlorn hopes, an idea that they may yet amount to something.

The Baltimore Consolidated

Consists of the old Baltimore and half of the Baltimore American, covering 2,400 feet of ground and adjoining the south line of Caledonia.

The shaft is down 450 feet, from which two stations are opened at 225 feet and 445 feet from surface. In their upper level, as much to their own surprise as to anybody else, they have lately struck a vein—5 feet thick—assaying extravagantly—and heavily in gold—at a point 360 feet west of shaft. Continuing west they are in a mixture of quartz and porphyry, assaying well. According to street reports, after cutting through a heavy clay, on their lower level, at 50 feet west of shaft they again cut into ore averaging \$68 per ton. Interested stockholders being urgent in their claim for admission to view and prospect this suddenly uncovered prize, and threatening to gain admittance thereto by order of Court; the Superintendent quietly flooded the drift and left for San Francisco. Returning a day of two since,

operations were again resumed, the lower station drained and repaired, and they are now about renewing work of progress, but until a few feet more of ground are cut, Baltimore Consolidated must remain, to the public, an enigma.

The line of the American Flat mine being but a short distance south of the Baltimore Consolidated shaft, a drift is being run on contract from the 225 foot level of the latter, to prospect this claim. Since the Baltimore Cons. strike, nearly every old location in American Flat district has been revived, in hope of finding the Baltimore ledge. Dump piles are showing themselves in every direction, old shafts are being re-opened, new shafts started on the line of where the ledge ought to be, and an appearance of life awakened on this almost deserted section. Should a well-defined, paying ledge of ore be found on this ground, conflict of titles will present the richest field for lawyers yet known, for there will be no end of litigation. The only active work of importance that has been prosecuted steadily during the last few months south of the Baltimore has been on the "Arizona and Utah" and Globe mines.

The Arizona and Utah

Is a west location for a back vein. Their shaft is down 300 feet, from which point they are drifting east for ledge. At 150 feet down they cut through the ledge in their shaft showing good ore. They expect to reach the ledge in their lower drift in about two weeks, and have every reason to look for a good development.

The Globe,

Immediately south of the Arizona and Utah, is being worked by the same management. They are preparing to take out ore from their lower tunnel, stopping out on the incline which is being run 300 feet to connect with their upper workings. With the extensive body of ore they have in sight ready for extracting, a fair development in the Arizona and Utah, which is confidently expected, will restore to American Flat its enviable reputation of early days.

The Rock Island

Is the most southerly location on American Flat, and on a line southwest from the American Flat mine. It is a claim of not much importance at present, as the body of ore peesed through in their tunnel in early days proved to be nothing but a body of base ore 200 to 300 feet in width.

The Mines of Silver City

Are attracting considerable attention from capitalists in consequence of a mine being opened up with success called the Dayton.

This mine is owned and worked by private parties who have never consented to place the stock in the market, having confidence that the mine, on its merits, will eventually afford them remuneration for investment. Their new shaft is down 225 feet, from which point they are running for their ledge which has already been fully prospected by an old incline and shaft showing a well-defined vein of gold-bearing quartz 40 to 50 feet wide, which will pay handsomely.

Adjoining the Dayton on the south is a mine that has been owned and worked quietly during the past year by Messrs. Cantin & Everett, of San Francisco, called the

Kossuth,

Covering 2,700 feet of ground, and which has lately been put on the market. They have a double compartment prospecting shaft worked by a whim, which has been sunk 280 feet, to water level.

From the shaft they have cut the ledge at three different points; 50 ft., 200 ft. and 280 ft. levels showing extensive bodies of good milling ore. The company are about sinking a new shaft on a more favorable site for the permanent working and draining of the mine, machinery for which has already been ordered. Ore for milling is now being hoisted from their present shaft, and will be continued until their new shaft has attained sufficient working depth.

The Daney,

In Spring Valley, below the Kossuth, are now doing what ought to have been done years ago.

Having abandoned their old shaft, sunk on a spur of the ledge, which has never produced anything more paying than a bountiful supply of water, they have now removed to the main ledge, where they are sinking a new shaft with a good prospect of finding something in time.

The fluctuations in stock for the past week have taken operators here somewhat by surprise, knowing of no good reason for the unlooked for depreciations; yet such things will occur spasmodically, and the state of the stock market can easily be read on the street by that never failing barometer—the face of those most interested. As no unfavorable change has taken place in any of the mines the general confidence in the immediate future remains unshaken.

CANA.

Virginia, Nev., May 20, 1873.

COOS BAY RAILROAD.—The railroad connecting with Coos Bay, Oregon, the Coquille will be commenced by the 1st of June, and will be completed this summer as far as the Blue Mountain coal mines.

ALL the quartz mills near Virginia are busy day and night on ore from the Comstock mines. If the work increases there will be a demand for more mills, and good large ones too.

Academy of Sciences.

At the regular meeting of the California Academy of Sciences, held on Monday evening last, D. McClore, E. Malero and Gen. J. M. Schofield were elected members. Among the donations to the cabinet were the following: From Mr. Harford, a finely stuffed specimen of the large California hawk; also, specimens of the small foxes that abound on Santa Rosa Island.

From C. A. Williamson, of Honolulu, a specimen of the box fish, a curious creature, which is found under the edges of the coral reefs of Enderbury's Island, latitude 3 south, longitude 176. The fish is encased in a shell, with fins and tails protruding, in the form of a tortoise.

From Dr. Schlatter, of the Pacific Mail Steamship Co., specimens of the nautilus taken off Cape St. Lucas; also, specimens of a fish, not yet identified, taken off Cape St. Lucas.

From A. W. Chase, of the U. S. Coast Survey, specimens of infusorial earth from Catalina Cove, Santa Barbara channel; also, specimens of gypsum, from Santiago Cañon, Los Angeles county.

Dr. Blake presented specimens of a honey making ant, and read a paper in reference to the digestive function of the insect.

Dr. Kellogg exhibited and described a number of new plants.

Professor Davidson demonstrated a series of problems in mensuration.

Mr. Fullerton exhibited some crustacea found in alkaline water near Green river. He put some of the water in a bottle and corked the bottle up, the water being previously strained. On arriving here he found the water had settled and that it was quite full of living cyclops, just like he had frequently found in ponds near London, under very different circumstances. They are living and evidently multiplying in this strong alkaline water, in which it is supposed there are few living things. Professor Davidson said that in Hayden's expedition, animal life had been found in water of 180° F., at an elevation of 6,000 feet. Dr. Blake had found animal life in alkaline water of 130° at Calistoga, and in alkaline and sulphur water of 108°.

THE POWDER RIVER EXPEDITION.—Colonel Forrester's expedition to the Powder river, on the Yellowstone, has proved a success. The Yellowstone has been found to be more favorable for navigation than the upper Missouri. The object of the expedition was to find out whether supplies could be transported in safety from Fort Buford to the mouth of Powder river, where it is proposed to establish a formidable military post, under the Act of Congress appropriating \$200,000 for it; also two additional military posts to aid in protecting the workmen in the survey and construction of the Northern Pacific road. The supplies for the construction of that railroad can now be transported by this river line to the posts at the mouth of the Powder river, saving some 300 miles of difficult transportation by land.

THE OXYHYDROGEN flame, as used in the Stevens' Furnace, is now being applied for the purpose of generating steam at Park and Bowie's mill, Washoe. It may be stated that the steam used in running the experimental furnace in this city, was generated by the use of this jet, coal tar being used for fuel. If practically successful, in an extended trial, this will be a great boon to the Comstock region, where wood and coal is scarce and expensive.

AN ASSAY OFFICE is wanted in Utah and the *Tribune* urges the establishment of one in Salt Lake city. St. Louis people are trying to have a government assay office established in their town, but the *Tribune* thinks it ought to be in Salt Lake city, if it was the time required to ship silver bars to New York to be assayed would be saved and the bullion could be put in the market in a few days.

Borax has been found in Oregon, 37 miles south of Crescent city. The borate of lime is said to be found in huge boulders, weighing from two to three hundred pounds each, imbedded in the clay and gravel formation from the surface of the ground to the talcose slate bed-rock.

Improved Roasting Furnaces.

Good and cheap roasting and smelting furnaces are more needed on this coast to develop our mining resources, than any thing else we can think of; except, perhaps, more attention to legitimate mining and strictly honest management. The chlorination of silver in powdered ores, has, by the use of the Stedefeldt furnace been brought nearly to perfection. The only objection to be urged against the use of this furnace is the high cost of construction and the large royalty charged per ton. These reasons have of course deterred many companies from putting them up, who would have done so if the charges had been moderate. There are thousands and thousands of tons of low grade ores lying about the dumps of mines, on this coast, that cannot now be utilized, but which, if a saving of \$2 per ton could be effected, would pay to work. Where such great quantities of ore can be made use of, which is now considered useless, a profit of \$2 per ton would amount to a large sum of money.

We understand that the great objection to the Stedefeldt furnace—the expense of construc-

A New Stone Cutter.

Our New York correspondent sends us a glowing account of a new stone dressing machine on exhibition at Newark, N. J. The cutting implement is a gang of black diamond points rotating at a velocity of five thousand to the minute. By a most ingenious system of automatic movements, any design may be traced in relief and intaglio; and, in fact, any description of plain cutting, surfacing or bevelling is within the scope of its powers. The machines are made of different sizes and styles, according to the special purposes for which they are to be adapted. The invention thus combines the functions of the simple stone-saw, surfaeer and lathe, all in one; and, in addition, a polishing rotator, using emery or tannite instead of the carbons, is employed in connection with the cutter. The automatic movements may be so adjusted as to describe any geometric or irregular pattern. The ornamental work that would take a good workman a week to accomplish is performed in a quarter of an hour, and in a far more perfect manner. Specimens of work given to our correspondent were remarkable for the sharpness and exact-

Brookes' Still-Life Paintings.

We present to the readers of the Press this isene an illustration representing one of those admirable still-life pictures by a noted California artist, Sammel M. Brookes, and which have gained for him more than a local celebrity. The original from which the cut was made is in the possession of Mrs. T. O. Larkin, and is 32x40 in size. The painting represents codfish suspended from a hook in the wall, with their tails hanging over in front of the stone; a crawfish, some vegetables, wine and a Lake Tahoe trout. Of course an engraving can not be expected to do full justice to objects which depend upon their color for their excellence, and paintings especially must be seen to be properly appreciated. Nevertheless the cut will give our readers who have not the opportunity of seeing the original, a good idea, not only of the character of Mr. Brookes' specialty, but of this painting in particular, which is much admired.

A salient point in the fish pictures of this artist, leaving aside entirely the absolutely life-like, or rather death-like, perfection of color and accuracy of detail, is the peculiar happy manner in which the supple, pliant figure of a fish just dead, yet still possessing its natural contour, is depicted. The Lake Tahoe trout in the foreground is an illustration of this point. It looks as if it had, after a few useless struggles, given up its life quietly, and remains in the position which it died. In pictures with the characteristics of the one shown, Brookes has no superior, anywhere, and indeed the field is one in which few opponents dare to challenge. To catch the changing colors of a trout, shining fresh from its native element, needs a quick eye and an accurate memory, as well as skill with the brush and knowledge of the art. That Brookes' pictures are faithful portrayals of his subjects is evident at a glance at any one of them.

His forte is particularly "still-life," on which he is excelled by no one. His pictures are easily recognizable in any collection by those who have ever seen one of them before.

DISAPPOINTED AGAIN.—A not her "Gold Bluff Expedition" has tried it and failed. The latest was that on board the steamer *Monterey*, which was provided with all the necessary machinery for pumping up the aniferous sands from the bottom of the ocean. It is stated that the pumps worked well and large quantities of sand and gravel were brought up, but unfortunately the precious metal was extremely scarce. They only found the color and that was all. This expedition prospected along the coast as far north as Rogue river with the same

success. It was equipped by the Gold Bluff Sub-marine Mining Company, a New York incorporation, who spent several thousand dollars in the enterprise. Who comes next?

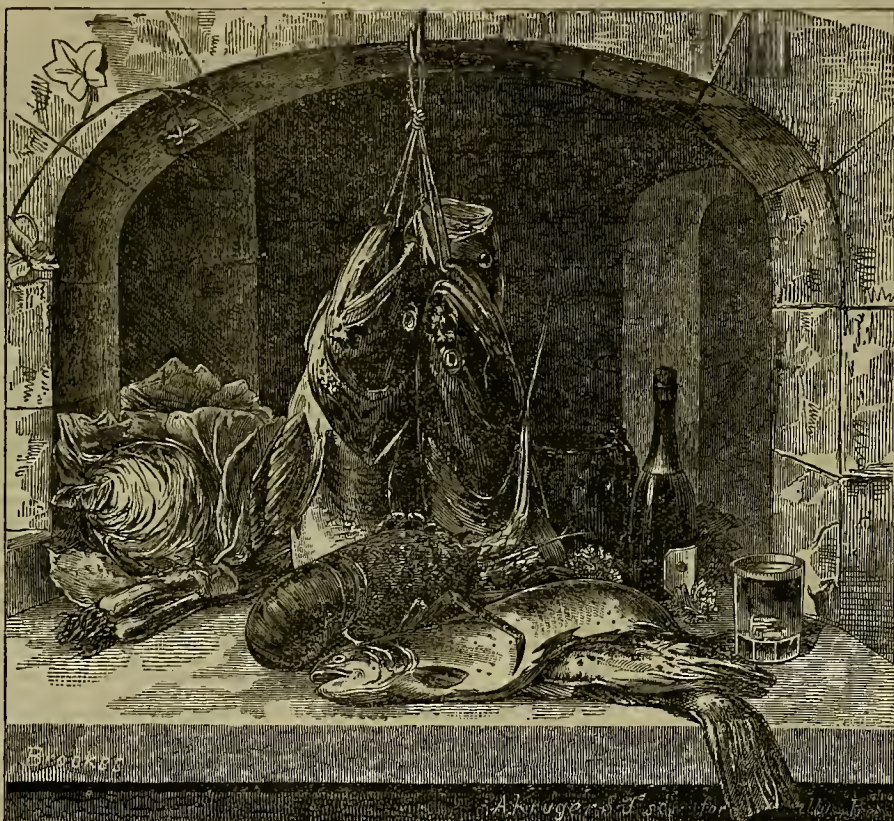
BISHOP'S DREDGING MACHINE, of which we spoke some time since, has been improved by the addition of a central screw, having on its point a "bit" intended to clean the way for the screw through tough clay, etc. Mr. Bishop has the contract for dredging the Oakland Bar, but has not as yet built any machine to do it.

THE AUBURN MILL is for sale or lease. The Nevada State Journal says the reason given is that the agent of the mortgagee in London has examined the property and is convinced it cannot be run profitably from London, so he has determined to sell the mill, or if no purchaser can be found to lease it.

A NEW TAILINGS MILL.—The Gold Hill News says: "Greeley, French & Co. are building a new mill on the site of the old Pioneer Foundry in Lower Gold Hill for the purpose of working a large amount of tailings which have been collected at a reservoir close by."

OIL COMPANIES in San Fernando are now making extensive arrangements for the collection and shipment of oil from their springs. They are going to bore to thoroughly test the source of supply.

A BULLION team with 750 bars of base bullion for this city arrived in Los Angeles from Corro Gordo on the 20th.



STILL-LIFE-BY S. M. BROOKES.

tion—has been modified to some extent by a new invention, having for its object a somewhat different plan of construction. This alteration, it is alleged, will effect a saving of about 30 per cent, on the cost of a furnace built on the old plan, and that without lessening the quantity capable of being roasted nor the quality of the work. There are at present objections to making the plan public, which will, however, shortly be removed. We hope to be able soon to lay the details of the proposed change before our readers.

SALE OF PATENT.—Mr. J. E. Emerson of Beaver Falls, Pa., owner of the patent for sawing stone with black diamonds (recently illustrated in the MINING AND SCIENTIFIC PRESS) has sold an interest to a company in Missouri, which has used the device for over eight months with satisfaction, for \$125,000. We are informed by Mr. Emerson's brother, of Oakland, that the inventor still reserves the right to manufacture all the saws; and they will before long be introduced on this Coast, together with new and improved teeth for sawing wood and lumber.

The engineers of the San Joaquin and Tulare Railroad Company have located the line to cross the Merced river about one mile above Snellings, and are now engaged in locating the route from the south fork of that river.

A LARGE new water tank is being built by the Imperial Mining Company east of their hoisting works, as a protection from fire.

ness of the angles. Neither chipping nor "deadening," even in executing the most intricate patterns in the most delicate material, were to be seen. The black diamonds were not affected by variation in the texture of the stone and, after having been in constant use for a year and a half, are found to be in perfect condition, not showing wear in the least although such refractory materials as Scotch granite, millstone grit, etc. were treated.

There are plain diamond saws and lathes in abundance, but no machine, as yet, that is capable of such widely extended application as this. The American patent was issued to Mr. Herbert Cottrell, of Newark, in July of last year. The machine is to be manufactured by the Colt's Arms Company—a sufficient endorsement, in itself, of the merit of the invention.

THE MANHATTAN Company of Austin will shortly erect a 20 stamp mill on the Lida Valley. The mines belonging to the company who will erect the mill, are in Gold Mountain from 15 to 20 miles distant. The mill is expected to be in operation by next September. Hiskey & Walkers eight stamp mill is at present the only one in the District. It continues dry and has constructed with it two reverberatory furnaces.

NEW HOISTING WORKS are to be put up on the Koesneth mine, near Silver City, Nevada. The success of the Woodville, Silver Hill and other mines near by has stirred up the owners of this one to renewed confidence and energy.

Highland District.—The Highland Company's Mines.

The editor of the *Pioche Record* has paid another visit to Highland Mining District, which is only five or six miles distant, and joins Ely District on the west. He says the fact that the Mendha Company will soon have their fine new mill in operation makes Highland, at the present time, the center of much interest. Having before referred to the Mendha Company's property and operations at length, we this time went to inspect the mines of the Highland Mill and Mining Company, whose office is at 306 Montgomery street, S. F., one of the wealthiest corporations on the coast, and under official management of gentlemen well known for energy, integrity and financial responsibility, J. N. Williams being the President. The company being organized to develop mines, and not to speculate in stock, bought up twenty-six of the most promising ledges in the district before entering upon extensive development, having determined to make the enterprise successful if there were paying ores in the district. And now, after having made two trips to Highland, each time, note-book in hand, personally inspecting the mines, we feel safe in saying—by which we mean that we believe our judgment will be vindicated by future developments—that it will prove one of the first lullion producing districts of the Silver State.

Out of the 26 ledges owned by the corporation we found time to visit 14, as follows:

Hamburg.

This mine is situated on the west side of Arizona Mountain, about a mile northeast of the Mendha mill. It is developed by a tunnel 200 feet in, and a shaft 40 feet deep. The tunnel is the finest piece of mining engineering we ever examined in the county, being five feet wide at the bottom, 6½ feet high, and it goes into the mountain as straight as an arrow. 175 feet from the mouth a drift is run to the north 22 feet, at which point a vein of rich mineral 18 inches wide is tapped, showing that the tunnel is running parallel with the ledge, but a little to the south of it. But the tunnel being intended to develop a number of mines, the proximity of the ledge is not regarded in its construction. It will be extended right on through the heart of Arizona Mountain. The main shaft goes down on the ledge (which dips but slightly to the north) 311 feet northeast of the mouth of the tunnel, breaking ground 125 feet above the tunnel level. It is now down 40 feet, the ore from top to bottom all being high grade, and varying in width from 16 to 24 inches. We have before us the assayer's certificates of samples got at different depths from the bottom as follows: \$65.98; \$279.04; \$375.20; \$211.17; \$220.67. The vein has been widening the last five feet of excavation, and is 22 inches strong at the bottom of the shaft, where the \$375 assay was obtained. The Hamburg is capped by white limestone, having been found by blossom tracing and cross-drifting; but the tunnel seems now to be entering a sort of quartzite. The course of the ledge is northeasterly and southwesterly.

The Mississippi.

The discovery shaft of the Mississippi is just west and near the crest of Arizona Mountain. The vein exposed is 3½ feet wide and the ore is extraordinarily rich, the assays generally running over \$1,000 to the ton, and never falling below \$50. But the developments, so far, are not encouraging. The vein, the first few feet it is followed by the shaft, (which might with propriety be called a tunnel,) runs in horizontally, lying almost flat, and then it begins to gradually assume a downward dip to the north, the same as the Hamburg. The Hamburg tunnel was started as much for the development of the Mississippi as the Hamburg, and will be pushed ahead until it intersects the Mississippi—if the vein is below to be intersected—at a point nearly 500 feet below the surface. Should the Mississippi "be caught" by the tunnel as favorably as it shows at the surface, it certainly would be worth a cool million or more. We can only hope that Mr. Malone's expectations will be realized.

The Blackfoot.

This is a vein of enormous extent, being from 4 to 10 feet in width. Its croppings are very heavy, and may be traced for 1,000 feet, solid ore masses weighing several hundred pounds jutting out at points. It is situated on the southeast end of Silver Mountain, about two miles a little west of north from the Highland mill. The main shaft is now down 25 feet, the vein being 4½ feet wide, strong at the bottom. We never examined a better defined ledge than the Blackfoot. It can be traced by its croppings for several hundred feet as clearly as if the vein had been continuously hared by surface cutting. The walls are very smooth and regular, going down almost perpendicularly. The assays taken vary from \$7.87 to \$88.90 to the ton. The prospect is fair for the Blackfoot developing into a great, permanent mine.

The Echo.

This, so far as developed, shows itself to be a very rich, but narrow vein, the pay ore not being over 12 inches wide, though the vein matter, or the distance between the walls, average two feet. It is situated on the south side of Silver Mountain, and about a mile from the

Mendha mill. The ore carries a good deal of iron, with considerable lead, but it is of the "free milling class." The company expect much of the Echo.

The Georgia.

The Georgia is a ledge of unusually good indications. It is on the north side of Silver Mountain, and dips a little, very little, to the north. The assayer's returns have never fallen below \$110, and usually go high up in the hundreds. Average width between the walls, 4 feet. A tunnel is being run in to cut the ledge a great distance below the surface; it is now in 80 feet, and will be pushed ahead with all vigor.

The Howarth

Is a ledge of modest showing now, but may improve as development progresses. The vein is nowhere over 10 inches wide, but what there is of it is solid mineral, and very rich. The ore is of the smelting class, much of it being pure galena. Three tons, smelted in Eureka as a test, yielded \$148 to the ton.

The Phil. Sheridan

Is 400 feet above the Howarth, and runs parallel with it. Ore of the same class, though not quite so rich, and the vein is wider than the Howarth. Development not sufficient to form opinions.

The Bengal Tiger

Is northwest of the Phil. Sheridan, and carries the same class of ore; but we consider it much more promising vein.

The Lewiston City

Carries more iron and less lead than any other vein we examined on the northern side of Arizona Mountain. It can be traced 1,000 feet by the croppings, has an average width of 4 feet in the main shaft, and the walls are smooth and regular. The assays run from \$7 to \$40 to the ton.

The Lincoln

Runs parallel with the Lewiston City, is equally well defined, assays about the same, and goes down nearly straight; but the vein, so far, is impracticably narrow, nowhere showing over 13 inches in the shaft; but the heavy and long line of croppings seem to give promise of important developments in the Lincoln.

Black Bess

Is not far from the Lincoln, and shows the same general character of ore; but it is much more promising. The vein in discovery shaft exposes an average width of 4½ feet. It is situated on the north side of and well up on Arizona Mountain.

The War Eagle

Is on the extreme end of Arizona Mountain. The vein is fully 4 feet in width wherever exposed, and ore is of the "free milling class." The average of a number of assays is \$16 to the ton.

The Pocahontas

Is on the northeast point of Arizona Mountain. The vein is 2½ feet wide, and ore very similar to that of the War Eagle. Dips to the northwest. The walls are well defined, and the vein can be traced 1,200 feet by the croppings.

The Yellow Jacket.

This is the company's extreme western location, being a mile west of the Mendha hoisting works.

The above are the ledges personally visited, and the description of each was written on the ground. Of those not visited Mr. Malone mentioned the California, French, Western View, Ida Elmore and Mountaineer as very highly valued by the company.

The Highland Mill and Mining Company is organized on a strong financial basis, and they have no intention to put their stock on the market until the value of the mines is proved by actual development; none of the stock has changed hands at less than \$2 a share, and all sales and purchases have been confined to members of the corporation. If the Mendha mill proves a success, the company will immediately erect a mill of the same model; but the failure of the Mendha enterprise—of which we have no apprehension—would not discourage the Highland Company. The holders of the stock, knowing the silver is in the ore, and, being strong financially, will, if necessary, follow failures with new trials, until success is achieved. But we believe Highland District, within sixty days, will prove itself to be one of the richest silver mining camps in Nevada.

The Highland Mill and Mining Company have secured a most eligible mill-site, having wood and water in abundance.

Los Angeles Mines.

A party of horax hunters, on their return from the Slate Range, says the Los Angeles Express, called by the Placer Gold Mines or Gravel Range, between Santa Clara and Elizabeth Lake. Their report of the extent and richness of the gold deposit in that range is more encouraging than anything we have yet heard. They made several locations, and still there is room for hundreds of enterprising miners to locate on the richest gravel deposits in the State. They prospected extensively, and from the top of the highest hills to the bottom of the canyons they found gold in every pan of earth, averaging from 5 to 60 cents to the pan.

These deposits have long been known, but until recently no one knew that water could be found in the vicinity with which to work them.

Colonel Peel, W. W. Jenkins and others have prospected the mountains back of the gold

range and found that the waters of Elizabeth lake, Peru creek and San Francisco creek can all be brought on to this gold range, with comparatively little expense.

The waters of these streams have been taken up by these parties, and the ditch from the waters of Elizabeth lake is being made, and in a few days a company will go up to begin the construction of other ditches. Here will he work for five hundred men, who must draw their supplies from this valley. A wealthy company have already taken hold with Jenkins and Peel, and other old miners are looked for every day, who are going to view the field. Now, if our horax men will also secure the aid of experienced capitalists to put their enterprise through, our city and county will receive a new impetus.

The Sancelito Railroad.

The work which is quietly going on at Sancelito and beyond, in preparing the track for the ties, the rails, the cars and traffic, is of more importance to the city of San Francisco and to the trade of this coast, than many people probably, have as yet appreciated. The purpose is to complete the line to Walhalla, some forty miles beyond Russian River Valley, to be continued hereafter, doubtless, many miles farther. But the extent indicated as the immediate purpose of the Company is sufficient to create a great change in the route of certain trade, and a vast increase in some others. The road will pass San Rafael, and through a country beyond, one of the finest in the State for the production of certain crops necessary to meet the wants of San Francisco, potatoes and other vegetables, but more particularly through the finest for dairy purposes on the coast. The number of cattle, of milch cows, and the amount of butter and cheese produced would surprise most of our citizens were they informed of the facts. There is a vast extent of grazing country of the best quality within the range of the proposed road, and its construction and completion will furnish an outlet for its produce which it has long needed, and which will prove of incalculable benefit to the settlers in that region.

But beyond this section, and perhaps in some respects of still more importance, will be the facility this railroad will extend for the transportation of lumber. It will tap one of the finest and most extensive lumber regions in the State. The products of this section in lumber have been equal to the demand heretofore, and will continue for many years to come. But the great drawback has been the difficulty of shipment. Only by comparatively small vessels can this lumber be brought to market. The coast is rugged and dangerous, with no harbors, only roadsteads in which small craft may lie, not in safety, but taking great risks of shipwreck. For at any time a heavy sea may commence running in, without any premonition, and the danger of shipwreck at once becomes imminent. Many vessels have thus been wrecked on that rocky coast, without a breath of wind to excuse it. A trade thus dangerous and full of risk, of course adds very materially to the cost of lumber here. But this road will materially change all this. Ships chartered for Chili or Peru, instead of being loaded from small craft from the dangerous heights and months of rivers along the coast, will haul alongside the wharves at Sancelito and take their loads in safety where no summer winds nor southeasters can trouble them.

By extending the railroad to deep water which is found in the vicinity of the present Sancelito wharf, ships may lie and receive their cargo of lumber in safety, no risk of wreck or tornado. It is perhaps too soon to estimate the effects the opening of this road will have upon the little hamlet on this side of the Bay. But that it will become quite a shipping point for lumber is very certain. It is but a short distance across the Bay. A ferry boat of the proper and requisite qualities can make the run across in a short time. Men doing business in the city may have their residences here. The climate, taking the year round, is the most agreeable of any in the State. It is protected pretty generally and effectually from the sea breezes which sweep San Francisco six months every year, and it is never hot and oppressive as in the interior. The views from the town, and from neighboring hills, cannot be surpassed for beauty, and even sublimity; while as for health no location on the coast can surpass it. The value and importance of this little spot has been overlooked by the people generally, but its time will come as surely as that of any other location on this coast.—*Sancelito Herald*.

THE OROVILLE MINES.—The interest in the new placer diggings below town continues unabated. The Greeley Company have nine claims on their claims, and are putting in pumps to drain them. The Globe Company are also progressing with their claims, and all will soon be able to make a profitable showing. The Chinese are still buying everything in sight that has a title that will enable them to hold their purchase. Several claims have been sold at a fair figure during the week. The most extensive sale noted is that of Dr. Jenkins, who has disposed of his fine ranch and forty acres, vineyard, with a fine brick residence and all necessary buildings for the manufacture and storage of wines, to Chinese miners for

\$4,200. This was one of the finest vineyards in the county, requiring irrigation, and producing an extensive crop of grapes. Whether Celestial miners mine upon the vineyard, depends, we suppose, entirely upon the fact whether they can find "one dollar hap" per day beneath it. They readily buy all the ground to which they can find title, and have plenty of money for that. An American mining population could prosper here, but this class do not appear to care for diggings that cannot be worked with sluice and hydraulic, and dispose of their claims for a few hundred dollars in coin. The Chinese population is rapidly increasing, and are overrunning the valley and giving it the appearance of an ant's nest.—*Butte Record*.

Copper Among the Ancients.

The copper operations of the ancients in the Lake Superior regions still remain a mystery, though there seems every reason to believe that they were conducted by the Aztecs who left their haunts in Mexico and the Ohio Valley and made summer pilgrimages to the copper region. There has not been found either bones or implements or any means of identification whatever, except the tools which are occasionally picked up in the ancient pits. And some of these pits and workings are so completely covered with drift and formation that it is impossible to form any estimate in regard to the time when they were operated. The presence of bismuth, lead, mercury and arsenic in this copper enabled these ancient miners to mould it into cutting tools which possessed a finer and tougher edge than pure metal, and answered to some extent the place of iron and steel—though the tools found, after being cleaned of their oxidation do not appear materially harder than the copper itself. Along the courses of some of the veins, old shafts or surface workings have been found which when freed of debris show plainly the methods pursued by their former workers in extracting the ore. So far as can be judged the rock was softened and cracked by means of fire built against it, and kept going for days, then the loosened masses were pried out by ho poles. Remains are found of huge stone hammers, and copper chisels and other cutting tools, and in several cases large masses of metal have been found that have been dug around on all sides and partly underneath, and then left as if the miners had given up all hopes of detaching, and raising it to the surface.

The only reason for inferring that this was the work of the Aztecs is the fact that specimens of this copper, with native silver adhering, have been found in the monads of the Ohio Valley, having evidently been used as ornaments by the mound builders and buried with them. Similar specimens have been handed down for many generations in Mexico as having been possessed by the Aztecs who were said to be cognizant of valuable mineral lands far to the north.

It has been doubted by many that the copper tools of the ancients really possessed the density and cutting power usually ascribed to them. Sir Gardiner Wilkinson, however, remarks that some of the bronze daggers found by him in Egyptian tombs were so beautifully tempered that after having lain buried for 3,000 years, they possessed, when dug up, an elasticity almost equal to that of steel. It is thus definitely proven that the Egyptians really did possess an art, which has been lost, of making bronze of a particular fine temper, capable of taking and keeping a sharp edge.—*Marquette Mining Journal*.

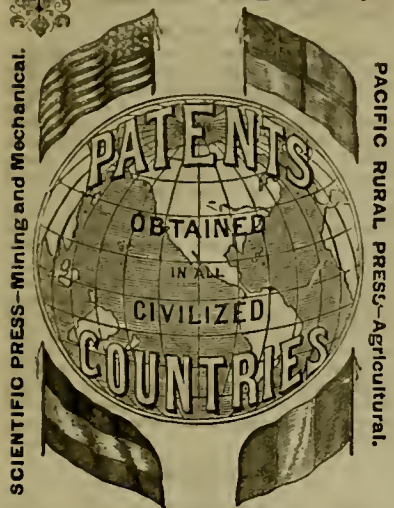
TRAIL TO STICKEEN RIVER.—Captain William Moore, of Fraser river steamboat fame, left by the "Otter," for the Skeena, thence for the Stickeen river, from the head of navigation of which it is his intention to open a good pack trail for horses and mules, into the heart of the country at the head-waters of this great river. He was successful in procuring from the local Government a charter to cut this trail, which commences at Buck's Bar, to connect with Dease's Lake, thereby enabling miners and others who have been long desirous to penetrate a country known to be rich in minerals, gold, silver and copper. The charter is given for five years, during which time the road is to be kept in good repair at all seasons, the consideration being the right to collect a small toll on goods passing over the route. Captain Moore, we all know, is energetic, and he possesses good facilities for carrying out the work. At the month of the Skeena he has a vessel adapted to the navigation of the Stickeen, which he will take thither, together with his pack animals, which have been wintering at the mouth during the past season. We understand also that a portion of the money voted for exploratory purposes during the last session of the Legislature has been set apart toward the prosecution of the discovery of new mining grounds in this hitherto almost unknown section of the Province. *Colonist*.

FOUNDRY BUSINESS IN SICILY.—The foundry business seems to be flourishing in the home of the famous God of fire. The Oretafoundry, in Sicily, is said to employ 700 hands, who work up 2,000 tons of metal a year. The iron is obtained from England, Belgium and Lombardy, and the coal from England. Various kinds of steam machinery, agricultural implements, etc., are made at this foundry, the market for which is mostly found in Greece and Turkey.

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The success of this most delicious and unrivaled Condiment having caused certain dealers to apply the name of "Worcestershire Sauce" to their own inferior compounds, the public is hereby informed that the only way to secure the genuine is to ask for LEA & PERRINS' SAUCE, and see that their names are upon the wrapper, labels, stopper and bottle.

Some of the foreign markets having been supplied with a spurious Worcestershire sauce, upon the wrapper and labels of which the names of Lea & Perrins have been forged, L and P give notice that they have furnished their correspondents with power of attorney to take instant proceedings against manufacturers and vendors of such, or any other imitations by which their right may be infringed.

Ask for LEA & PERRINS' Sauce, and see name on wrapper, label, bottle and stopper. Wholesale and for export by the Proprietors, Worcester, Cross & Blackwell, London, &c., &c., and by Grocers and Oilmen universally.

EUCALYPTUS.

The attention of the Medical profession is respectfully called to the following preparation of this new remedial agent. Eucalyptus and its preparations have been found useful in obstinate cases of intermittent and Malarial Fevers, often supplanting the use of Quinine. The proxemics of Asthma and Catarrh are greatly controlled, and in various Kidney diseases and Catarrh of the Bladder it seems to act like a specific.

FLUID EXTRACT EUCALYPTUS.

This extract represents in a concentrated form the medicinal effects of the leaves of Eucalyptus Globulus.

THE ELIXIR OF EUCALYPTUS.

This compound presents the properties of the leaves in a palatable form and elegant appearance. Dose—One tablespoonful, to be repeated as often as the case demands.

Clearing of Eucalyptus Globulus, useful in Asthma, Difficulty of Breathing, Incipient Pleurisy, etc. Prepared and sold by JAMES G. STEELE & CO., Chemists and Apothecaries,
No. 521 Montgomery St., between Clay and Commercial, San Francisco.

CHARLES F. KIRCHNER,

Sampler and Crusher of Ores,

NO. 11 DRUMM STREET,

San Francisco.

Metallurgy and Ores.

RODGERS, MEYER & CO.,

COMMISSION MERCHANTS,

ADVANCES MADE

On all kinds of Ores, and particular attention

PAID TO

CONSIGNMENTS OF ORES—
4v16-3m

O. W. STRONG.

W. L. STRONG.

C. W. STRONG & CO.,

Metallurgical Works.

No. 10 Stevenson Street, near First, SAN FRANCISCO.

We purchase Ores, Bullion, etc. Ores worked and Tests made with care. Also, Assays of Gold, Silver, Copper, Lead, Tin and other Metals.

LEOPOLD KUH,

(Formerly of the U. S. Branch Mint, S. F.)

Assayer and Metallurgical CHEMIST.

No. 411 Commercial Street.

(Opposite the U. S. Branch Mint)

SAN FRANCISCO, CAL. 7v21-3m

JOHN TAYLOR & CO.,

IMPORTERS OF AND DEALERS IN

ASSAYERS' MATERIALS

Chemical Apparatus and Chemicals,

Druggists' Glassware and Sundries,

PHOTOGRAPHIC GOODS, ETC.,

512 and 514 Washington street, SAN FRANCISCO

We would call the special attention of Assayers, Chemists, Mining Companies, Milling Companies, Prospectors, etc., to our large and well adapted stock of

ASSAYERS' MATERIALS

—AND—

Chemical Apparatus,

Having been engaged in furnishing these supplies since the first discovery of mines on the Pacific Coast.

Our Gold and Silver Tables, showing the value per ounce Troy at different degrees of fineness, and valuable tables for computation of assays in Grad Ounces, will be sent free upon application.

7v25-1f

JOHN TAYLOR & CO

Important to Miners and Mill Men.

Silver-Plated Copper Amalgamating Plates, for Saving Gold.

Of all sizes and in any quantity, furnished to order. Full instructions sent for operating. Particular attention given to plating goods for Builders, Plumbers, etc. Hotel and Restaurant work replated.

SAN FRANCISCO GOLD AND SILVER PLATING WORKS,
655 Mission street, San Francisco.

7v25-3m E. G. DENNISTON, Proprietor.

Varney's Patent Amalgamator.

Best Machines Stand Unrivaled.

For rapidly pulverizing and amalgamating ores, they have no equal. No effort has been, or will be spared to have them constructed in the most perfect manner and of the great number now in operation, not one has ever required repairs. The constant and increasing demand for them is sufficient evidence of their merits. They are constructed so as to apply steam directly into the pulp, or with steam bottoms, as desired.

This Amalgamator Operates as Follows.

The pan being filled, the motion of the muller forces the pulp, to the center, where it is drawn down through the aperture and between the grinding surfaces. Thence it is thrown to the periphery into the quicksilver. The curved plates again draw it to the center, where it passes down, and to the circumference as before. Thus it is constantly passing a regular flow between the grinding surfaces and into the quicksilver, until the ore is reduced to an impalpable powder, and the metal amalgamated.

Sellers made on the same principle excel all others. They bring the pulp so constantly and perfectly in contact with quicksilver, that the particles are rapidly and completely absorbed.

Mill-men are invited to examine these pans and settlers for themselves, at the office, 229 Fremont Street, San Francisco.

Nevada Metallurgical Works.

RIOTTE & LUCKHARDT,

Consulting Mining Engineers and Metallurgists, No. 21 First St., S. F.

WORKING TEST MADE BY ANY PROCESS—TESTING OF PROCESSES.

Plans furnished for the most suitable Process for Ores.

Assaying in all its Branches.

Analysis of Ores, Minerals, Waters and all other substances.

Special attention paid to the mining and metallurgy of Quicksilver.

PLATINUM

Vessels, Apparatus, Sheet, Wire, Etc., Etc.

For all Laboratory and Manufacturing Purposes.

H. M. RAYMOND,
25 Bond street, New York.

Platinum Scrap and Ore purchased.

(Continued from Page 325.)

the mine shows better than usual, and gives high assays. A witness is about being started to connect this first and second levels.

STROCK.—Nothing doing at the new shaft. Mill kept steadily running on ore from old shaft.

UNION CO.—Cross-cutting in the ledge shows it to be 40 ft. in width of quartz, which gives low assays. The main north drift is now being driven ahead. **WOODVILLE.**—Daily yield 35 tons, keeping both mills at work. The ore is yielding well, as the bullion shipments have been about \$1,000 per day, but the full returns will not be definitely ascertained until the last of the month, when the mill makes a clean up. The north part of the mine is looking especially well, and there is plenty of ore already in sight to keep the mills running for several months.

YELLOW JACKET.—Drifting east at the 1500-ft. level in good looking quartz and porphyry, also north and south at the 1400-ft. level. No new developments.

WHITE PINE.

ROSE STRIKE.—White Pine News, May 17: We were shown an assay by O. J. Pope, assayer, which read: From 139.70 oz. of sample, 1,538.88 silver. The ore came from the Mammoth Mining Co.'s property.

THE SOUTH ADROVA.—The Peerless Chamber, with its immense deposit of rich ore, seems to be increasing both in quality and quantity as the work progresses. They are now engaged in extracting ore from the Peerless Chamber, to run the Stanford mill of 30 stamps, and also busily pushing through a drift from the Riddale shaft to connect with the ore in the chamber referred to. The daily amount of ore shipped to the mill will exceed 30 tons, and from one shaft. The workings in the Peerless Chamber have now reached a depth of 140 ft., with a width not yet ascertained. Before leaving the Hill we visited the assaying house, where we found a gang of men busily engaged assaying the ore preparatory to its shipment. Much of the mineral here will assay high into the hundreds, but the manager takes all alike, bundles it into wagons, and assures us it works from \$60 to \$70 per ton at the mill.

WARD DISTRICT.—A mining district, situated 18 miles southeast from Robinson, was prospected by Mr. Ward from whom it derives its name. We are informed that considerable work is being done on the location in the vicinity, and among the most promising mines is the Mountain Pride, which has a shaft down 40 ft., all the distance in a fine body of mineral. Assays from this mine show \$200 in silver, with from \$18 to \$23 in gold, and 15 per cent. copper.

Colorado.

CLEAR CREEK.—Georgetown Record, May 11: This county, for the three months ending April 31, 1873, gave a total coin value of \$317,200.17.

J. O. Stewart's shipment of silver bullion in those 3 months amounted to \$45,529.67. The two largest purchasers and shippers of ore were G. W. Hall & Co. (\$58,059.83) and Wm. Dement (\$52,864.42). Then comes the Boston and Colorado Smelting works of Black Hawk, \$42,824.43 worth of ore, principally from Seaton Hill, purchased directly of the miners.

During the three months ending April 31, G. W. Hall & Co. purchased ore from the Colorado Central lode to the value of \$18,257.60 coin value, which showed an average value of silver of 95.6 ounces per ton, or \$1,225.50—higher, we believe, than the average value of any other silver mine in the world, considering the grades calculated upon. The lode was discovered by W. P. Linn last fall, and lies in a deep sag of a seven-foot mountain, the crevice being covered by 70 or 80 feet of drift and boulders. The mine has yielded at times at the rate of \$1,000 per day. The ore is an argenteous galena, containing gray copper, brittle, natural and ruby silver and silver glance. At times the latter is so prominent that the ore will not pass through the crusher, but fattens out like soft malleable metal. The Baltimore tunnel Co. have struck the Baltimore lode, supposed to be the same as the Terrible 150 ft. from the tunnel's mouth. The ore is very rich.

Mining is very active on Seaton Hill, in Gilson and Hukil gulches, and in Virginia canon. The Victor, Seaton, Veto, Queen and Hukil mines are producing considerable ore. The Franklin is under lease. These mines will turn out an average of 100 ounces per ton.

GILPIN.

The product of the mines of Gilpin Co. for the three months ending April 31, 1873, is:

	COIN VALUE.
Bullion.....	\$210,000
Matte and Gilpin County ores, shipped by B. & O. Smelting Co.....	173,215
Ores treated elsewhere.....	4,000

Total for quarter.....\$387,215

The Boston and Colorado Smelting works have shipped matte having a coin value of \$221,812. This was the product of ore from Gilpin, Clear Creek and Boulder counties.

Montana.

ANOTHER GOLD BRICK.—Helena Herald, May 8: Messrs. Keating & Blacker have just made another run and clean-up at their quartz mill at Keatingville, Jefferson county, and the result is 250 ounces of gold retort, which was brought to this city yesterday by them in person, and deposited in the First National Bank. The value of this bullion in currency is about \$12,000.

RICH QUARTZ.—Yesterday Mr. Kemp made an assay of rock from the L tie Emma lead owned by Mr. J. H. Russell, on Upper Ten Mile, which went \$2,560 per ton in silver.

PHILIPSBURG.—New North West, May 10: Frazer and others are at work cleaning out shafts and putting the Speckled Trout mine in order to be received by the Philadelphia Co., who have purchased it. The Co. running the Blay & Bell mill cleaned up 850 ounces of bullion on Wednesday, the result of 2 1/2 days run.

EMERTSBURG.—At this mine every claim is being worked, with excellent prospect of good yield, but as yet few have been cleaned up. Wallwork, Davis & Co. are putting a flume in the lower portion of Henderson Gulch, and have flattering prospects. O'Brien & Henderson, Cartwright, Masserson & Co., and Ferguson & Co.'s ground looks well. Henderson will produce the usual amount of gold this year.

PIONEER.—The companies are at work in the vicinity. Old Bratton Bar is paying big. Allen & Ashland cleaned up \$1,400 Wednesday from 5 days' run. Jos. Allen picked up a 4 oz. nugget on his ground sluice a few days since.

YAMHILL.—The Rock Creek Ditch is now flowing about 1500 inches of water. J. D. Bins & Co. have a large amount of good ground in Independence Dist. Warren & Co., and McManisters & Co. are running telegraph lines 70 to 100 ft. high to carry water to the ground on Thunderbar. Hoover & Co., at head of Squaw Gulch, are opening up new ground that is believed to be rich.

Utah.

SPECIMEN SILVER BAR.—Salt Lake Tribune, May 12: We were yesterday shown a small silver bar weighing 31.30 ounces which was produced from a piece of ore weighing between 8 and 9 pounds, from the Price mine at Dry Canon, which nearly adjoins the celebrated Mono mine. The bar in question had on its face the following certificate of value over the names of Messrs. Sanders & Sprague, of this city:

Price Mine—Silver Bar, 31.30 oz. Value per ton silver, \$8,552.72; gold, \$2,230.90; \$10,783.62—Sanders & Sprague.

MINING ITEMS.—Mining Journal, May 13: \$33,000 worth of bullion has passed of late through W. F. & Co.'s express office for the East.

We have been shown by Col. Lee and Mr. Thos. Bennett a beautiful silver brick from the Queen of the West mine. It weighed 122 1/2-100 ozs.; fineness 974; valued at \$154.45. Several magnificent specimens of ore from the same mine were also shown us. This mine is situated in Camp Floyd district.

Washington Territory.

NEW MINES.—Walla Walla Union, May 10: On last Wednesday, Messrs. Joe Peavy and Chas. Campfield arrived in town with 155 pounds of what is supposed to be argenteous galena. It is very heavy—some large pieces appearing as heavy as so much pure lead. It is quite soft, and can be cut with a knife. When broken, it breaks in square and angular shapes, and is a little darker in color than bar or pig lead. It is mixed with whitish quartz. The specimens that were brought down have more metal than quartz in them. The mine was discovered by Mr. Peavy, about 6 years since, while he was carrying the mail across Pen d'Oreille Lake in a boat. He has frequently had assays of the ore made, and the returns have always shown about 80 per cent. lead and \$30 per ton silver. Last fall some of it was sent to San Francisco, and the above return was had. A few weeks since Messrs. Peavy and Campfield returned from here and went to the mine, which is situated on the south side of the Pen d'Oreille Lake, and after digging through 5 or 6 feet of snow, struck the ledge in two different places about 1,000 ft. apart. They sunk down about 4 ft., and found it very rich all the way, but could go no deeper without blasting; as they had only a pick and crowbar, they were compelled to leave off. The ledge from 8 to 10 ft. thick, between granite walls, and seems to "pitch" at a great angle.

PATENTS & INVENTIONS.

Telegraphic List of U. S. Patents Issued to Pacific Coast Inventors.

[FROM OFFICIAL REPORTS FOR THE MINING AND SCIENTIFIC PRESS, DEWEY & CO., PUBLISHERS AND U. S. AND FOREIGN PATENT AGENTS.]

By Special Dispatch, Dated Washington, D. C., May 20th, 1873.

FOR WEEK ENDING MAY 6th, 1873.

FIRE ESCAPE.—Charles C. Milton, assignor one-half interest to Edward A. Lesnerd, S. F., Cal.

WAVE POWER.—Charles Buckner, assignor to Henry Bruce, John Reiners, J. H. A. Ludwig and Isaac M. Ward, S. F., Cal.

CONDENSER AND REFINER FOR SPIRITUOUS LIQUORS.—William Neil, S. F., Cal.

TREATING GOLD AND SILVER ORES.—Joseph Kallmes, S. F., Cal.

COMBINED SHEARS AND BUTTON HOLE CUTTER.—Alfred Swingle, S. F., Cal.

MANUFACTURE OF SOAP.—Richsd P. Thomas, S. F., Cal.

CANADIAN PATENT.

NEW MATERIAL FOR STUFFING MATTRESSES.—William J. Woodley, assignor to self and Julius Jacobs, S. F., Cal.

"The patents are not ready for delivery by the Patent Office until some 14 days after the date of issue. Note.—Copies of U. S. and Foreign Patents furnished by DEWEY & CO., in the shortest time possible (by telegraph or otherwise) at the lowest rates. All patent business for Pacific coast inventors transacted with greater security and in much less time than by any other agency."

Notice of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s Scientific Press American and Foreign Patent Agency, the following are worthy of mention:

AMALGAMATING VESSEL.—Fred. Morris, of San Francisco, Cal. Mr. Morris is a practical miner. It takes a practical miner to improve mining machinery, and make it practicable. Mr. Morris patents a settler or amalgamating vessel, the bottom of which is made of wood, placed with the grain vertical. The miller is also made of wood, disposed in the same manner, so that the action in the pan or settler is accomplished without bringing the pulp into contact with metal. Miners will understand the value of this invention. The patent also covers the employing of a siphon for draining off the water and tailings from the settler. One leg of the siphon passes into the vessel at or near the center, where the pulp is less agitated by the miller than at or near the rim, and consequently where it has the best chance to settle. The other leg extends outside of the vessel, so that the siphon will draw off the pulp and water from the surface, leaving the heavier portions.

LUBRICATING SHAFT BEARINGS.—Jerome Haas, Stockton, Cal. A patent for lubricating the hearings of shafts by water or oil applied under the foot or bearing point of the shaft upon the hydrostatic principle. The pump which forces the liquid under the shaft or between the hearing surfaces is operated by the revolution of the shaft. This patent relates more particularly to a plan for lubricating horizontal shafts, but Mr. Haas holds a patent dated in 1869 for lubricating the hearings of upright shafts upon a similar principle.

SWIVEL HOISTING APPARATUS.—Thomas M. Martin, S. F., Cal. Mr. Martin believes in "killing two birds with one stone" (when he can), or in other words he believes in employing only one engine to do the hoisting from several shafts, when the shafts are in close proximity to each other. In order to do this he has invented and patented a swivel pulley, over which the hoisting rope from the engine passes. The swivel pulley can be faced about to any desired direction in order to accommodate the different shafts in which the hoisting is to be done. The plan is economical.

Notes of Travel in Mariposa County.

[By Our Traveling Correspondent.]

ENS. PRESS.—This county at present is extremely quiet as far as mining matters are concerned. The sounds of drills, picks and blasting are heard in the direction of "Hites Cove" located 18 miles above the town of Mariposa, in the direction of Yosemite valley. I did not visit that district, but learned that some 30 men were engaged in working Hites & Co.'s mine, said to be paying splendidly, and known to be very rich. Your readers will probably like to hear something about the "Mariposa Estate" that the inhabitants of this State were excited about several years back, but known only by name.

Las Mariposas Estate,

Owned by the Mariposa Mining and Land Company, and consisting of 44,386, 83-100 acres, was finally confirmed to John C. Fremont in July 1855, at which time it was surveyed by H. A. Higley, Deputy surveyor, by order of the U. S. Government. Full possession was not obtained by Col. Fremont until the spring of 1859; from that time until June 1860, when Trenor W. Park took possession of the same, and successfully worked it until June 1863, when it was bought by the Mariposa Mining Co., and F. L. Olmsted put in as Superintendent and general manager. His management ceased in May 1865, when it passed into the hands of Dodge Bros. (as creditors). Under their management a very large indebtedness was paid off. The indebtedness in 1865 against the estate was something over \$200,000; in December 1866, (at which time a receiver was appointed), the indebtedness was reduced nearly one-half. J. J. McEwen, now postmaster and principle merchant of Modesto, Stanislaus county, was the receiver and manager of the company until the spring of 1868, during which time the suit pending between the Dodge Bros. and the Brumagins was settled.

From 1868, until the fall of 1871 it was managed by T. Goodsell and J. G. Rice who held, and worked it for the company, which company, at this time held it under a "deed of trust." In the Fall of 1871 it was duly advertised, both by the sheriff of the county for taxes, and the holders of the trust deed, and sold to the

Mariposa Land and Mining Co.,

Which now leaves the title perfectly clear and undisputed,—something that did not exist until now, since Fremont first took hold of it in 1855. The capital stock of the present company is \$15,000,000—ten millions of which was set apart as a working capital, the other \$5,000,000 deferred capital.

From the fall of 1871, to May 1st, 1872, it was managed by R. H. Lucas, during which time the present company took possession, as before stated, with an unclouded title.

From May 1872 until the present writing, Mr. E. O. Darling has been superintendent and general manager, and the prospect of his long continuance is good. During the greater part of last year this company worked into the depth of their "Pine Tree Ledge," under the scientific advice of one Prof. O. W. Easton.

After spending some \$40,000 the company ceased this kind of prospecting, and now Mr. Darling has entire charge. This gentleman has filled various positions, from a humble clerk up to superintendent, having been in the employ of the different administrations steadily since the year 1864. He is thoroughly posted upon every ledge on the estate, and with the confidence of the company, which he has, I think, success will crown his efforts.

The River Tunnel

Ground has just been broken, and in a few days (or weeks at most) a tunnel will be commenced at or near a point close by the Benton Mill, near the Merced river. This tunnel is to be 7x7 feet in the clear, and will run nearly east to tap the "Pine Tree" or Linda Mine. It will tap the ledge at a distance from its mouth of about 1,200 feet. When completed the tunnel will be 600 feet in length, and will strike the said ledge 900 feet below its present workings, or about 1,500 feet from the surface. Five months is the supposed time it will take to strike the ledge (1,200 ft.). The object of this tunnel is two-fold—drainage and for easy transportation of the ore. For the more speedy completion of the tunnel a

Burleigh Drill and Compressor

Is now being put in position. Giant Powder is to be used as the blasting agent. A. F. Horn, Esq., is the mechanical engineer. A drill of the same character as above mentioned will also be put up immediately to sink a deep shaft on the Princeton Mine, located at Mt. Bullion, on the estate. This company is at present employing about 60 men. Their intention is now to concentrate all their forces upon sinking the above mentioned shaft, to more fully develop the Princeton Mine, and upon the River Tunnel to facilitate and cheapen the working of the "Linda Mine." At the Benton Mill, the proposed mouth of the River Tunnel, the company have ample water power to run 100 stamps, and can have 64 stamps in running order at 24 hours' notice. The ore of this company runs as high as \$42 per ton, but averages about \$12; the cost of mining and milling has been \$5.57 per ton.

Mount Gains Mill,

Jos. Spagnoli, Supt.; Edward Mockert & J. Spagnoli, proprietors. This quartz mill is run by steam power, has 10 stamps. Its capacity is about 16 tons daily (24 hours); now doing custom work only. It is located midway between Hornitos and Bear valley, five miles from either.

Washington Mine.

This mine is located at or near Quartzburg, about two miles north of Hornitos. The mine belongs to an incorporation, with a capital stock of \$2,500,000, in 5,000 shares. Nathaniel Page, President; T. B. Wingard, Secretary; and G. E. Webber, Jr., Superintendent. This company claim 3,000 feet of a ledge, running northwest by southeast, which pitches south. The ledge varies from five to twenty-four feet in width, and averages about fifteen feet thick. There is no free gold in this company's ore, but is highly charged with sulphurates, and pays an average of \$10 per ton in the batteries, and the sulphurates which they reduce at their own chlorination works, averages \$60 per ton; this mine is being developed by two shafts, one of which is down 520 feet; the other is 380 feet deep. Hoisting works run by steam command both shafts. This company have a 20-stamp mill on the premises, and run it night and day, crushing 25 tons every 24 hours; working in mill and mine 45 men regularly. L. P. Mc.

New Incorporations.

Forest Coal Mining Co., May 10. Object: to carry on the business of coal mining and the purchase and sale of coal and coal lands in this State. Capital stock, \$500,000 in shares of \$100 each. Trustees—John C. Wm. Strader, C. D. Burroughs, M. Bankhead and Geo. H. Smith.

Santa Rosa Coal Mining Co., May 20. Object: Coal mining and buying and selling coal and coal lands in the State of California. The company will begin operations near Mark West Creek, Sonoma County, Cal. Capital stock, \$2,000,000, in shares of \$100 each. Trustees—H. H. Haight, Edward Galpin, S. D. Kreider and O. P. Rand.

Meetings and Elections.

ADAMS HILL CONS. M. Co.—May 20: Trustees.—G. T. Lawton, O. F. Giffin, J. B. Haggis, Joseph Clark and J. H. Williams.

INOMAR M. Co.—May 20: Trustees.—H. O. Kibbe, J. W. Ford, L. Steinhart and W. Easton.

WELLINGTON M. & SHELTON CO.—May 20: Trustees.—G. W. Weaver, C. W. Kellogg, H. H. Allen, O. W. Shild and W. N. Young.

RIENING STAR M. Co.—May 20: Last year's Trustees re-elected.

Leather Market Report.

[Reported for the Press by Dolliver & Bro.]

SAN FRANCISCO, Wednesday, May 21, 1873.
The demand for Domestic Skins and Sole Leather continues light at old prices. The same may be said in reference to French Skins, except that they have an upward tendency.

City Tanned Leather, # D.....	26 00/23
French Calf Leather, # D.....	24 00/23
Country Leather, # D.....	23 00/23
Stockton Leather, # D.....	22 00/23
Jodot, 11 to 12 Kil, per doz.....	55 00/23
Jodot, 11 to 12 Kil, per doz.....	55 00/23
Jodot, second choice, 11 to 12 Kil, per doz.....	55 00/23
Jodot, 12 and 13 Kil, per doz.....	55 00/23
Corneillon, 12 to 13 Kil, per doz.....	55 00/23
Corneillon Females, 12 to 13 Kil, per doz.....	55 00/23
Beaumontville, 15 Kil, per doz.....	55 00/23
Simon, 18 Kil, per doz.....	55 00/23
Simon, 20 Kil, per doz.....	55 00/23
Simon, 24 Kil, per doz.....	55 00/23
Robert O'Fall and 4 Kil, per doz.....	55 00/23
French Kips, # D.....	1 00/23
Alfama Kip, # D.....	50 00/23
French Sheep, all colors, # D.....	8 00/23
Eastern Calf for Backs, # D.....	1 00/23
Sheep Roams for Toppings, all colors, # D.....	9 00/23
Sheep Roams for Linings, # D.....	5 00/23
Robert O'Fall and 4 Kil, per doz.....	55 00/23
Best Jodot Calf Boot Legs, # pair.....	5 25/23
Good French Calf Boot Legs, # pair.....	4 50/23
French Calf Boot Legs, # pair.....	4 00/23
Harness Leather, # D.....	24 00/23
Fair Bridle Leather, # D.....	43 00/23
Skirting Leather, # D.....	24 00/23
Wax Leather, # D.....	30 00/23
Butt Leather, # D.....	21 00/23
Wax Side Leather, # foot.....	17 00/23
Eastern Wax Leather.....	25 00/23

San Francisco Metal Market.

WEDNESDAY, May 21, 1873.	
IRON.	
Scotch Pig Iron, # ton.....	\$60 00
White Pig, # ton.....	60 00
Refined Bar, bad assortment, # D.....	60 00
Refined Bar, good assortment, # D.....	60 00
Boiler, No. 1 to 4.....	55 00
Plate, No. 5 to 9.....	55 00
Sheet, No. 10 to 18.....	55 00
Sheet, No. 14 to 20.....	55 00
Sheet, No. 24 to 27.....	55 00
Horse Shoes, per keg.....	9 00
Nail Rod.....	11 00
Norway Iron.....	11 00
Other Irons for Blacksmiths, Miners, etc.....	6 25 9 25
COPPER.	
Braziers.....	35 00
Copper Tins.....	50 00
O. N. P. S. Pat.....	55 00
Sheet Copper, # D.....	55 00
Sheathing, Yellow.....	25 00
Sheathing, Old Yellow.....	25 00
Composition Nails.....	25 00
Composition Bolts.....	25 00
TIN PLATES.	
Plates, Charcoal, 1X # box.....	14 50
Plates, 1 O Charcoal.....	15 00
Roofing Plates.....	15 00
Banca Tin, Slabs, # D.....	40 00
Steel—English Cast, # D.....	20 00
Flat Bar.....	22 00
Punch Points.....	16 00
Russia (for mould boards).....	17 00
Zinc Sheet.....	5 00
Nails—Assorted sizes.....	5 00

Try Dr. Evory's Diamond Catarrh Remedy.
Only 50 Cents.

Says John to Nance, you look so bright,
Your eyes they sparkle, like a star.
Oh! yes, says Nance, Dr. Evory's remedy
Has cured that horrid, bad catarrh.
OUT OF THE FOG AT LAST.—Dr. Evory has discovered the only cure for Catarrh and Colds. One bottle gives immediate relief, and a few bottles effect a cure. All we ask is a trial. If your druggist don't have it, send to Dr. A. F. Evory & Co., 9 Post street, S. F. It only costs 50 cts. 14726-3m

Mining and Other Companies.

Due to the time necessary to mail this present large edition of the Mining and Scientific Press, we are obliged to press on. The delay is in the very latest hour we can receive advertisements.

Alpine Gold Mill and Mining Company.

Location of works, Packerville Mining District, Amador County, California. Principal place of business, San Francisco, Cal.

Notice is hereby given that at a meeting of the Board of Directors of said Company, held on the 18th day of May, 1873, an assessment (No. 4) of one dollar per share was levied upon the capital stock of the Corporation, payable immediately, in United States gold coin, to the Secretary, at the office of the Company, No. 438 California Street, San Francisco, Cal.

Any stock upon which this assessment shall remain unpaid on the 15th day of June, 1873, will be delinquent, and advertised for sale at public auction, and unless payment is made before, will be sold on the 21st day of June, 1873, to pay the delinquent assessment, together with costs of advertising and expenses of sale. By order of the Directors.

JOEL F. LIGHTNER, Secretary.

Office, No. 438 California Street, San Francisco, California. m15

The Central Land Company--Office and principal place of business, 338 Montgomery street, Room 5, San Francisco, California.

Notice--There are delinquent upon the following described stock, on account of assessment levied on the 9th day of April, 1873, the several amounts set opposite the names of the respective shareholders, as follows:

Name.	No. Certificate.	No. Shares.	Amount.
Jacob Hardy.....	36	100	\$50 00
Edward McLean.....	10	50 balance	50 00
Edward McLean.....	11	50 balance	50 00
Edward McLean.....	12	50 balance	50 00
F B Haswell.....	34	100	50 00
F B Haswell.....	35	100	50 00

And in accordance with law, and an order of the Board of Directors, made on the 9th day of April, 1873, so many shares of each parcel of said stock as may be necessary, will be sold at public auction, at the above named room 5, 338 Montgomery street, San Francisco, Cal., on Saturday, May 31, 1873, at 11 o'clock P. M. of such day, to pay said delinquent assessment thereon, together with costs of advertising and expenses of sale.

W. M. HELMAN, Secretary.

Office, Room 5, Nn. 338 Montgomery street, San Francisco, Cal. m17

Dutch Flat Blue Gravel Mining Company.

Place of business, San Francisco.

Notice is hereby given that at a meeting of the Directors, held on the 13th day of May, 1873, an assessment--No. 2--of 50 cents per share was levied upon the capital stock of the Corporation, payable immediately in U. S. Gold Coin, at the office of the Company, Room 11, 401 California Street, San Francisco, Cal.

Any stock upon which this assessment shall remain unpaid on the 15th day of June, 1873, will be delinquent and advertised for sale at public auction, and unless payment is made before, will be sold on Monday, the 14th day of July, 1873, to pay the delinquent assessment, together with costs of advertising and expenses of sale.

W. M. HELMAN, Secretary.

Office, Room 11, 401 California Street, San Francisco. m16

Eagle Quicksilver Mining Company--Principal place of business, San Francisco, Cal. Location of works, Santa Barbara County, California.

Notice--There are delinquent upon the following described stock, on account of assessment levied on the 18th day of January, 1873, the several amounts set opposite the names of the respective shareholders, as follows:

Name.	No. Certificate.	No. Shares.	Amount.
Miner, G. B.....	Unissued	8	\$150 00
Roberts, M. S.....	Unissued	8	150 00
Pauline, Sarah D N.....	Unissued	1/2	25 00
Allyn, John.....	Unissued	1/2	12 50
Allyn, John.....	Unissued	1/2	12 50

And in accordance with law, and the articles of agreement of said Company, and an order of the Board of Directors thereof made on the 18th day of January, 1873, the whole or each undivided part of each delinquent share in said mine as may be necessary to pay said assessment upon each, will be sold to the highest bidder, at public auction, for cash, in United States gold coin, at the office of the Company, Room 5 and 6, No. 302 Montgomery street, San Francisco, Cal., on Monday, the 26th day of May, 1873, at the hour of 2 o'clock P. M. of said day, to pay each delinquent assessment thereon, together with costs of advertising and expenses of sale.

WM. H. WATSON, Secretary.

Office, Room 5 and 6, No. 302 Montgomery street, San Francisco, Cal.

San Francisco, May 22, 1873.

Equitable Tunnel and Mining Company.

Location of works, Little Ootomwood District, Utah Territory.

Notice is hereby given that at a meeting of the Board of Directors, held on the 5th day of May, 1873, an assessment (No. 2) of ten cents per share was levied upon the capital stock of the Corporation, payable immediately in United States gold and silver coin, to the Secretary, at the office of the Company, No. 35 New Merchants' Exchange, San Francisco, Cal.

Any stock upon which this assessment shall remain unpaid on the 15th day of June, 1873, will be delinquent and advertised for sale at public auction, and unless payment is made before, will be sold on the thirtieth day of June, 1873, to pay the delinquent assessment, together with costs of advertising and expenses of sale. By order of the Directors.

CHARLES S. HEALY, Secretary.

Office, No. 35 New Merchants' Exchange, San Francisco, Cal. m16

Fear Stone Company of California--Location of principal place of business and works, City and County of San Francisco, California.

Notice--There are delinquent upon the following described stock, on account of assessment (No. 5) levied on the 1st day of April, 1873, the several amounts set opposite the names of the respective shareholders as follows:

Name.	No. Certificate.	No. Shares.	Amt.
Booth, Lucius A.....	11	405	\$810 00
Booth, Lucius A.....	12	45	90 00
Emery, J. B.....	34	450	900 00
Emery, J. B.....	35	50	100 00
Perline, N. P.....	65	50	100 00
Perline, N. P.....	66	50	100 00
Perline, N. P.....	67	50	100 00
Perline, N. P.....	68	50	100 00
Perline, N. P.....	69	50	100 00
Perline, N. P.....	70	50	100 00
Perline, N. P.....	71	50	100 00
Spaulding, N. W.....	15	405	810 00
Spaulding, N. W.....	16	45	90 00
Spaulding, N. W.....	19	405	810 00
Spaulding, N. W.....	20	45	90 00
Tripp, E.....	41	8	16 00
Wegner, R. Trustee.....	65	5	10 00
Wegner, R. Trustee.....	72	12	24 00
Wegner, R. Trustee.....	81	80	160 00

And in accordance with law, and an order of the Board of Directors, made on the 1st day of April, 1873, so many shares of each parcel of said stock as may be necessary, will be sold at public auction at the office of the Company, No. 414 California Street, San Francisco, California, on Monday, the 26th day of May, 1873, at the hour of 1 o'clock P. M., of such day, to pay delinquent assessments thereon, together with costs of advertising and expenses of sale.

R. WEGENER, Secretary.

Office, No. 414 California Street, San Francisco, Cal. m10

Hasloe Mill and Mining Company--Location of works, Gentry's Gulch, Mariposa County, Cal. Principal place of business, San Francisco, Cal.

Notice is hereby given that at a meeting of the Board of Directors, held on the 14th day of May, 1873, an assessment (No. 1) of fifty (50) cents per share was levied upon the capital stock of the Corporation, payable immediately, in U. S. Gold and Silver coin, to the Secretary, at the office of the Company, Room 11, No. 403 California Street, San Francisco, Cal. Any stock upon which this assessment shall remain unpaid on the 15th day of June, 1873, will be delinquent and advertised for sale at public auction, and unless payment is made before, will be sold on the 21st day of July, 1873, to pay the delinquent assessment, together with costs of advertising and expenses of sale.

Office, Room 11, No. 403 California Street, San Francisco, Cal. m11

Heckerdorn G. and S. M. Co.--Stock-HOLDERS' MEETING.

The Annual Meeting of the stockholders of the Heckerdorn G. and S. M. Co., for the election of Trustees and the transaction of such business as may be presented, will be held on Friday, May 24th, 1873, at 2 o'clock P. M., at the office of the Company, No. 510 Jackson Street, San Francisco, California.

LOUIS TERME, Secretary.

May 17th, 1873.

Hardy Coal Mining Company--Location of principal place of business, San Francisco, Cal.

Notice--There are delinquent upon the following described stock, on account of assessment levied on the 26th day of March, 1873, the several amounts set opposite the names of the respective shareholders as follows:

Name.	No. Certificate.	No. Shares.	Amount.
Warren Goodale.....	37 (old)	94	\$569 30
Edward McLean.....	1	36	36 00
Edward McLean.....	2	52	52 00
Edward McLean.....	6	41	41 00
Edward McLean.....	16	100	100 00
Edward McLean.....	25	50	50 00
Edward McLean.....	23	60	60 00
Edward McLean.....	24	150	150 00
Edward McLean.....	33	2	2 00
Edward McLean.....	35	4	4 00
Edward McLean.....	37	46	46 00
O S Kittridge.....	35 (old)	4	50 00
E O Lowrey.....	15	12 1/2	12 00
Jacob Hardy.....	10	100	100 00
Jacob Hardy.....	21	10	10 00
Jacob Hardy.....	21	85	85 00
Jacob Hardy.....	31	8 1/2	8 50
Jacob Hardy.....	38	15	15 00
Jacob Hardy.....	40	2	2 00
Jacob Hardy.....	41	8	8 00
Jacob Hardy.....	42	1	1 00
Jacob Hardy.....	43	1	1 00
M H Eastman.....	28	45	45 00
M H Eastman.....	29	65	55 00
M H Eastman.....	30	50	50 00
Bartlett & Wilcox.....	33 (old)	50	312 50

And in accordance with law, and an order of the Board of Directors, made on the 26th day of March, 1873, so many shares of each parcel of said stock as may be necessary, will be sold at public auction at the Company's office, Room 5, No. 338 Montgomery street, San Francisco, Cal., on the 24th day of May, 1873, at the hour of 12 o'clock M., of said day, to pay said delinquent assessment thereon, together with costs of advertising and expenses of sale.

JACOB HARDY, Secretary pro tem.

Office, Room 5, No. 338 Montgomery street, San Francisco, Cal. m3

Ida and Rhoda Lewis Consolidated Mining Company--ANNUAL MEETING.

The annual meeting of stockholders of the Ida and Rhoda Lewis Consolidated Mining Company, for the election of Directors and transaction of such business as may be presented, will be held on Tuesday, June 18th, at 1 o'clock P. M., at the office of the Company, No. 10 Webb Street, San Francisco, California.

J. DE STA MARINA, President.

A. O. MORSE, Secretary.

San Francisco, May 19, 1873. m19-1d

Kincaid Flat Mining Company--Principal place of business, San Francisco, Cal. Location of works, Bolinas Mining District, El Dorado County, California.

Notice is hereby given that at a meeting of the Board of Directors, held on the 6th day of May, 1873, an assessment (No. 1) of ten cents per share was levied upon the capital stock of the Corporation, payable immediately, in United States gold and silver coin, to the Secretary, at his office, No. 217 Sansome Street (up stairs), San Francisco, Cal. Any stock upon which this assessment shall remain unpaid on the 15th day of June, 1873, will be delinquent and advertised for sale at public auction, and unless payment is made before, will be sold on Wednesday, the 2d day of July, 1873, to pay the delinquent assessment, together with costs of advertising and expenses of sale.

R. H. CORNELL, Secretary.

Office, 217 Sansome Street (up stairs) San Francisco, Cal. m7

Mansfield Gold Mining Company--Principal place of business, San Francisco, California. Location of works, Kelsey Mining District, El Dorado County, California.

Notice is hereby given that at a meeting of the Board of Directors, held on the 8th day of May, 1873, an assessment of five cents per share was levied upon the capital stock of the Corporation, payable immediately, in United States gold and silver coin, to the Secretary, at the office of the Company, No. 331 Kearny Street, San Francisco, Cal.

Any stock upon which this assessment shall remain unpaid on the 15th day of June, 1873, will be delinquent and advertised for sale at public auction, and unless payment is made before, will be sold on Tuesday, the 1st day of July, 1873, to pay the delinquent assessment, together with costs of advertising and expenses of sale.

WM. SMALL, Secretary.

Office, No. 331 Kearny Street, San Francisco, Cal. m15

Office Newton Booth Consolidated Mining Company--NOTICE TO STOCKHOLDERS.

Some irregularities having occurred in the levying, advertising and collecting the assessment levied on the 10th day of February, 1873, on account of the 25 cents per share on the capital stock of the Newton Booth Consolidated Mining Company, notice is hereby given, that at a meeting of the Board of Directors of said Company, held on the 10th day of February, 1873, said assessment levied on the said 10th day of February, 1873, has been rescinded, and another assessment of 50 cents per share has been levied in lieu thereof. Any one having paid the assessment levied February 10th, 1873, is all credited for the amount paid on account of the assessment levied this day.

LOUIS FRANKONI, Secretary.

San Francisco, May 17th, 1873.

Newton Booth Consolidated Mining Company--Location of principal place of business, San Francisco, California. Location of works, Ely District, Lincoln County, Nevada.

Notice is hereby given that at a meeting of the Directors, held on the 7th day of May, 1873, an assessment of fifty cents per share was levied upon the capital stock of the Corporation, payable immediately, in United States gold and silver coin, to the Secretary, at the office of the Company, No. 314 California Street, San Francisco, Cal. Any stock upon which this assessment shall remain unpaid on the 14th day of June, 1873, will be delinquent and advertised for sale at public auction, and unless payment is made before, will be sold on the 12th day of July, 1873, to pay the delinquent assessment, together with costs of advertising and expenses of sale.

Office, No. 314 California Street, San Francisco, California. m10

Office of the Providence G. and S. Mining Company--Location of Works, Nevada County, California. Principal place of business, San Francisco, California.

The annual meeting of stockholders of the Providence G. and S. Mining Company, for the election of Directors and transaction of such business as may be presented, will be held on Friday, the 26th day of June, 1873, at 3 o'clock P. M., at the office of the Company, Room 37, New Merchants' Exchange, San Francisco, California.

F. T. FOLSOM, President.

J. M. BUFFINGTON, Secretary. m12-1d

Rising Star Mining Company--Location of principal place of business, San Francisco, California.

Notice is hereby given that at a meeting of the Board of Directors, held on the 25th day of April, 1873, an assessment (No. 4) of six cents per share was levied upon the capital stock of the Corporation, payable immediately, in United States gold and silver coin, to the Secretary, Room 31, New Merchants' Exchange, California Street, San Francisco, Cal. Any stock upon which this assessment shall remain unpaid on the 20th day of May, 1873, will be delinquent and advertised for sale at public auction, and unless payment is made before, will be sold on the 1st day of June, 1873, to pay the delinquent assessment, together with costs of advertising and expenses of sale. By order of the Directors.

M. BUFFINGTON, Secretary.

Office, 31 New Merchants' Exchange, California Street, San Francisco, California. m3

Schell Creek Mining Company--Location of principal place of business, No. 304 California Street, San Francisco, State of California. Location of Works, Schell Creek Mining District, White Pine County, State of Nevada.

Notice is hereby given, that at a meeting of the Board of Directors, held on the 10th day of April, 1873, an assessment of ten cents per share was levied upon the capital stock of the Corporation, payable immediately, in United States gold coin, to the Secretary, at the office of the Company, No. 304 California Street, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the 14th day of May, 1873, will be delinquent, and advertised for sale at public auction, and unless payment is made before, will be sold on Monday, the 24th day of June, 1873, to pay the delinquent assessment, together with costs of advertising and expenses of sale.

P. W. VAN WINKLE, Secretary.

Office, No. 304 California Street, San Francisco, Cal. m15

POSTPONEMENT.--The day for demanding shares delinquent on the above assessment is hereby postponed until Saturday, the 24th day of May, 1873, and the sale thereof until Monday, the 16th day of June, 1873. By order of the Board of Directors.

P. W. VAN WINKLE, Secretary.

The Sanderson Gold Mining Company--Location of works, Railroad Flat, Calaveras County, California.

Notice is hereby given, that at a meeting of the Board of Directors of said Company, held on the 5th day of May, 1873, an assessment (No. 4) of 12 1/2 cent per share was levied upon the capital stock of the Corporation, payable immediately, in United States gold and silver coin, to the Secretary of said Company. Any stock upon which said assessment shall remain unpaid on the 24th day of June, 1873, will be delinquent and advertised for sale at public auction, and unless payment is made before, will be sold on Thursday, the 19th day of June, 1873, to pay the delinquent assessment, together with costs of advertising and expenses of sale. By order of the Board of Directors.

WILLIAM STUART, Secretary.

Office, 113 Leidesdorff Street, San Francisco. m10

Sierra Iron Company--Location of Works, Sierra and Plumas Counties. Principal place of business, San Francisco, California.

Notice--There are delinquent upon the following described stocks, on account of assessment levied on the 1st day of April, 1873, the several amounts set opposite the names of the respective shareholders, as follows:

Name.	No. Certificate.	No. Shares.	Amount.
A S Easton.....	40	15	\$15 00
A S Easton.....	41	25	25 00
A S Easton.....	59	25	25 00
Mary E Salter.....	43	5	5 00
Mary E Salter.....	45	5	5 00
Mary E Salter.....	51	100	100 00
Mary E Salter.....	79	30	30 00
Theodore A Havermeyer.....	78	150	150 00
P N Lillard.....	100	1800	1800 00
H F Cutter, Trustee.....	91	100	100 00
H F Cutter, Trustee.....	104	50	50 00
H F Cutter, Trustee.....	103	50	50 00
H F Cutter, Trustee.....	116	100	100 00
H F Cutter, Trustee.....	116	100	100 00
H F Cutter, Trustee.....	119	50	50 00
H F Cutter, Trustee.....	120	50	50 00
H F Cutter, Trustee.....	122	45	45 00
James D Hague.....	93	44	44 00
James D Hague.....	94	500	500 00
Clarence King.....	95	45	45 00
Clarence King.....	96	500	500 00
John Banning, Trustee.....	52	2000	2000 00
Caleb T Fay, Trustee.....	73	500	500 00
Caleb T Fay, Trustee.....	74	500	500 00
Caleb T Fay, Trustee.....	75	500	500 00
Caleb T Fay, Trustee.....	77	500	500 00

And in accordance with law, and an order of the Board of Directors, made on the 1st day of April, 1873, so many shares of each parcel of said stock as may be necessary, will be sold at public auction, at rooms 5 and 6, No. 606 Montgomery street, on Tuesday, the 3d day of June, 1873, at the hour of 12 o'clock M. of said day, to pay said delinquent assessment thereon, together with costs of advertising and expenses of sale.

OALET T. FAY, Secretary.

Office, 606 Montgomery Street, San Francisco, Cal. m10

Swansea Mining Company--Location of works, Kelsey Mining District, El Dorado County, State of California. Principal place of business, San Francisco, California.

Notice--There are delinquent upon the following described stock, on account of assessment (No. 1) levied on the 28th day of March, 1873, the several amounts set opposite the names of the respective shareholders as follows:

Name.	No. Certificate.	No. Shares.	Amount.
Ira G Holt.....	5	6,000	\$150 00
S S Brooks.....	7	6,000	150 00
H O Kibbe.....	9	3,000	75 00
Cline & Franks.....	10	2,000	50 00
Washington Ayer.....	11	2,000	50 00
Geo L Bradley, Trustee.....	13	1,000	25 00
Fitch & Leight.....	23	8,000	75 00

And in accordance with law, and an order of the Board of Directors, made on the 25th day of March, 1873, so many shares of each parcel of said stock as may be necessary, will be sold at public auction, at the office of the Company, No. 425 Kearny Street, up stairs, San Francisco, California, on Wednesday, the 28th day of May, 1873, at the hour of 1 o'clock M. of said day, to pay said delinquent assessment thereon, together with costs of advertising and expenses of sale.

EDWARD P. GRAY, Secretary.

Office, 425 Kearny Street, up stairs, San Francisco, California. m8

Table Mountain Alpha Mining Company--Location of principal place of business, No. 438 California Street, San Francisco, California. Location of works: Table Mountain District, Tuolumne County, California.

Notice--There are delinquent upon the following described stock, on account of assessment (No. 1) levied on the 3d day of February, 1873, the several amounts set opposite the names of the respective shareholders as follows:

Name.	No. Certificate.	No. Shares.	Amount.
J Y Dixon.....	1	2000	\$500 00
J Y Dixon.....	37	902	225 50
E L R Wiatt.....	23	500	125 00
E L R Wiatt.....	24	300	75 00
E L R Wiatt.....	25	100	25 00
E L R Wiatt.....	26	100	25 00
W N Harris.....	3	2000	500 00
W N Harris.....	38	902	225 50
T H Holt.....	22	150	37 50
T H Holt.....	23	901	225 25
S Solomons.....	9	5	1 25
S Solomons.....	15	1495	373 75
S Solomons.....	42	900	225 00
Algernon Smith.....	11	100	125 00
Algernon Smith.....	44	225	56 25

Name.	No. Certificate.	No. Shares.	Amount.
B Marks.....	33	100	25 00
B Marks.....	10	1500	875 00
B Marks.....	30	450	112 50
B Marks.....	41	901	225 25
J W Roberts.....	13	500	125 00
J W Roberts.....	14	500	125 00
E A Richardson, Trustee.....	35	450	112 50
E A Richardson, Trustee.....	43	225	56 25
E A Richardson, Trustee.....	45	140	35 00
E A Richardson, Trustee.....	46	100	25 00
E A Richardson, Trustee.....	47	100	25 00
E A Richardson, Trustee.....	48	100	25 00
G W Bowie.....	17	200	50 00
J Jacobs.....	18	5	1 25
Win Fishel.....	19	100	25 00
Lucinda Foreman.....	20	100	25 00

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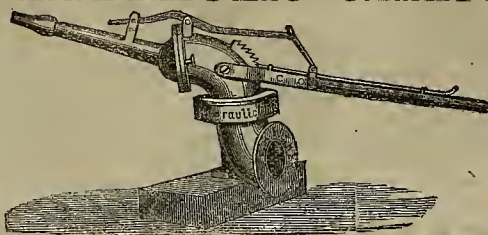
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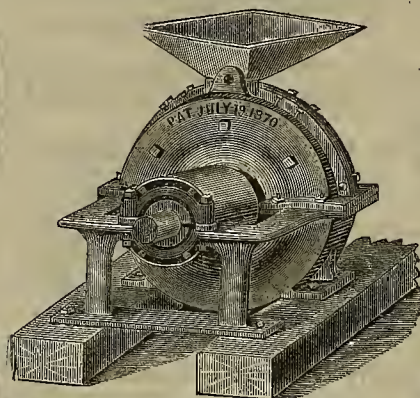
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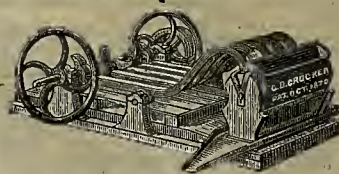
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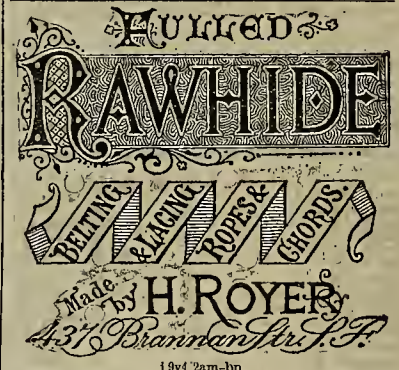
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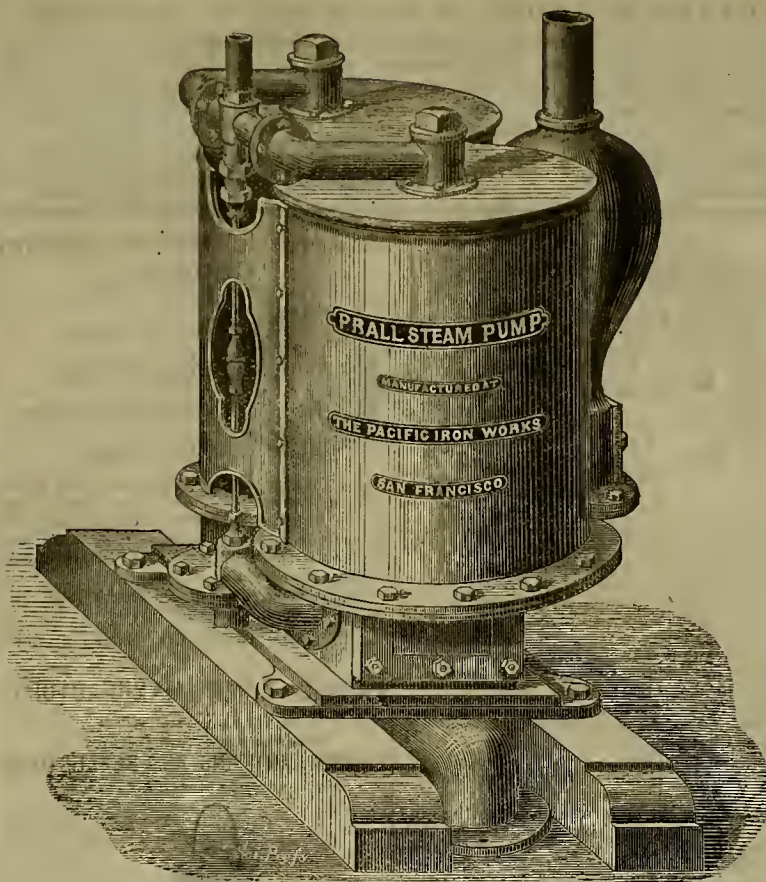
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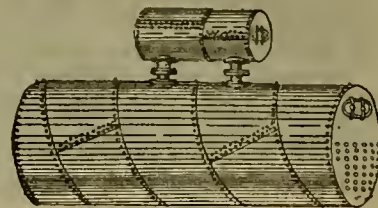
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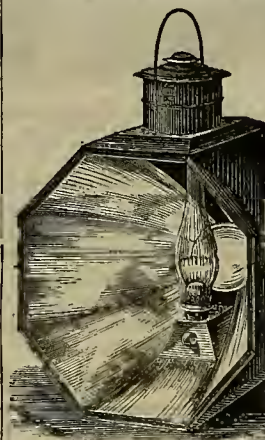
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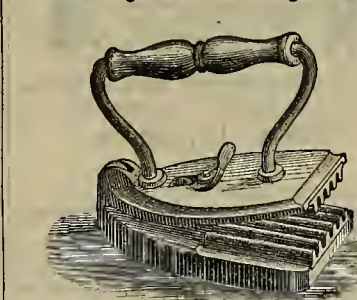
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Patent Endless Wire Ropeway.

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IMPORTANT TO

Mining Companies, Civil Engineers, Contractors, Etc.

The system of transporting material, such as Ores, from the mine to the mill, Earthen embankments, Rock from quarries, etc., by means of steel wire rope, has been well tested and found more economical, advantageous and reliable than any other method of transportation; and to the annexed certificates in connection therewith I beg to call the attention of those interested:

BUREKA, Nevada, July 10, 1872.

T. M. MARTIN My dear sir: On your leaving for San Francisco, it gives me great pleasure to hand you my written acceptance of the HALLIDIE TRAMWAY put up by you upon our mine in Freiberg.

It is a perfect success, discharging ten tons of ore per hour with two men's labor. It is perfectly simple in construction, and, as far as I can judge, there is nothing about it to ever get out of order—nothing to wear out. While ours requires but about two thousand five hundred feet of wire rope, I can see no reason why this line could not be extended almost indefinitely with equally happy results. Again, the carrying capacity might be doubled or quadrupled if desired. After several weeks trial upon our mine, the unanimous verdict of all who have seen it is a complete, unquestioned success. If this can be of any service to you, use it in any way you think proper. Very respectfully, O. C. GOODWIN.

EMMA HILL CONSOLIDATED MINING CO.,

Little Cottonwood, Utah.

Superintendent of Office, Sept. 25, 1872.

T. M. MARTIN, Esq., Sir: The Ropeway constructed by you (HALLIDIE'S PATENT) for the Emma Hill Consolidated Mining Company, has been built in a most substantial and workmanlike manner, and at this time in the best working condition. I most cheerfully accept the work for the Company, and recommend it to others wishing a sure and speedy transit for ores over places impracticable for wagon roads, etc. Respectfully,

L. W. COLBATH, Superintendent.

"The Vallejo works smoothly with the elevated wire tramway, which carries its load of ore as quietly and easily as if there was no winter or snow in the world."

"Whatever the objections to wire tramways may be on account of their cost, I have seen nothing yet that even approaches them in the facilities they afford for moving ore at all seasons of the year."—Correspondent Utah Mining Journal, Alta, Jan. 8, 1873.

The Vallejo Ropeway.

The Vallejo Tunnel Company's Tramway in Little Cottonwood, built on the HALLIDIE PATENT PLAN, is a complete success. It is between 2,300 and 2,400 feet in length, and is supported by thirteen stations. The fall in this distance is about 60 feet, and the wire rope, which is one-fourth of an inch in diameter, will surely and easily deliver one hundred tons in six hours. The machinery is automatic, loading and unloading the sacks or buckets. About one ton and a half can be sent down at one time. The stations are about two hundred feet apart, and the entire apparatus is strong and safe. As the wire rope is elevated about forty feet above the surface of the hill, the Tramway can be worked all winter long, without the slightest trouble.—Utah Mining Journal, Salt Lake, Sept. 22, 1872.

Mining Companies and others desiring to negotiate for the erection of this system of Ropeway, can communicate with me personally, or through Postoffice Box 944.

A. S. HALLIDIE, Patentes,

112 and 114 California Street, SAN FRANCISCO.

WIRE ROPE

For hoisting from mines, transmitting power, ship rigging, etc., of all kinds and sizes, on hand and made to order.

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An Illustrated Journal of Mining, Popular Science and Progressive Industry.

BY DEWEY & CO.,
Patent Solicitors.

SAN FRANCISCO, SATURDAY, MAY 31, 1873.

VOLUME XXVI.
Number 22.

Coleman's Sulphuret Saver.

The accompanying illustration represents a sulphuret saver, the invention of Charles C. Coleman, who obtained his patent some time since through the agency connected with this office. The apparatus is used for saving sulphurets and separating them from the light sand and debris which escapes from the molds, or it can be used for saving the fine gold from sluices in ordinary placer or hydraulic mining. It consists of a large hollow revolving vessel, which may be cylindrical in shape as the cut shows, or may be made slightly tapering so as to be somewhat smaller at one end than the other. This cylinder lies on its side revolving on a horizontal axis, and has its interior made in the form of a screw, the threads of which are of considerable depth. The sand and water are carried into the cylinder and deposited near its lower end. Another pipe extends entirely through the cylinder, and is perforated so as to discharge clear water against the side of the cylinder, and this washes the sulphurets clear, and also keeps them at the bottom of the same, so that, as the machine turns they advance along the bottom until they reach the upper end of the cylinder, where they are discharged clean, while the lighter debris is washed out at the lower end.

The supporting standards shown are placed on a frame. The cylinder is supported in the standards as shown, so that it turns on rollers, doing away with the use of an axis, leaving the interior entirely unobstructed. Friction rollers are employed, so as to allow the cylinder to revolve with ease. This cylinder may be made of wood or iron, but in either case the interior is formed into screw threads of considerable depth. The hopper conducts the tailings into the lower end of the cylinder, where they fall between some of the threads of the screw. The cylinder is kept slowly revolving in such a direction that the sulphurets and particles of gold remaining at the bottom and between the threads of the screw, will advance toward the upper end of the machine, and are finally delivered at that point, falling into any receptacle placed for them. In order to prevent the sulphurets from clinging to the cylinder and being carried up the side, a pipe passes through the machine which has several outlets, through which jets of water are constantly thrown against the side between the threads. This washes everything down and keeps it at the bottom between the threads, while it at the same time carries off the lighter particles, to be discharged at the lower end.

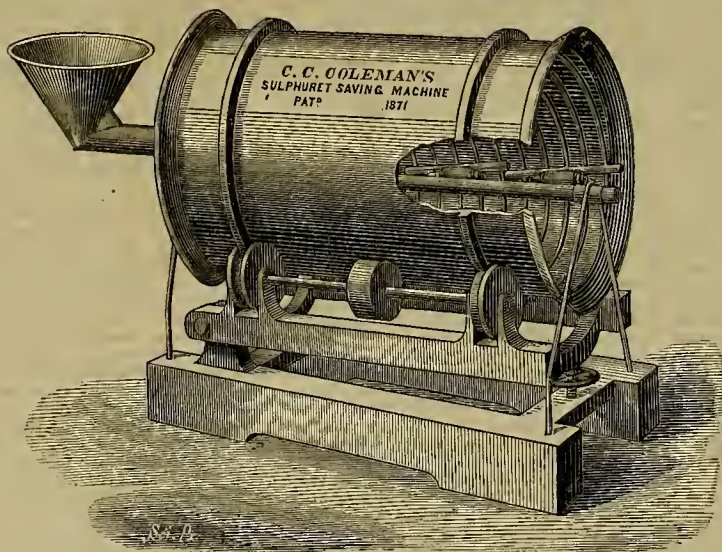
The cylinder may be driven by a chain or belt from a pulley, or by any of the ordinary appliances used in such cases. And the whole machine forms an economical and cheaply constructed device for the purpose described. Mr. Coleman is taking steps to introduce the machine extensively among the quartz mills throughout the Coast, and will manufacture them at a figure placing them within the reach of all. He may be addressed care of Dewey & Co., 338 Montgomery Street, San Francisco, Cal.

PATENT SUIT.—R. R. and Joseph Craig have commenced suit against W. H. Raymond *et al* to enjoin them from using a patent nozzle for hydraulic mining purposes, and for damages for having used it. The nozzle in question is well known.

SUTRO TUNNEL.—It is proposed to increase the capital stock of the Sutro Tunnel Co. to \$20,000,000 in 2,000,000 shares of \$10 each and the special meeting called for June 23d is for the purpose of taking the matter into consideration.

EUREKA VS. RICHMOND CON.—This mining suit is now going on at Eureka and is attracting considerable interest. During the examination of Mr. Stodfeldt, he was questioned at some length concerning the difference between a deposit and a fissure vein. He gave it as his theory of the mineral formations in Mineral Hill, that mineral springs containing dissolving agents had percolated the limestone, and, during the course of ages had carried away the rock and formed caves; that the character of the thermal springs, changing in the course of time, metalliferous deposits were deposited in these caves.

W. T. Davidson also testified that he never saw a vein in a limestone country, and he does not think there is a ledge in the district. His knowledge of mining was procured from experience entirely, and not from the study or theory of any author. Thomas Cohn also testified that in his opinion the ore in Ruby Hill was in deposits. B. S. Buckmunster, according to the *Sentinel*, swore as follows: I have been in



the superintendency of mines and have been mining manually more or less for the past ten years; through some of the mines at Virginia City, Gold Hill and in Utah; have been through the mines of the Eureka Consolidated and Richmond Companies in Ruby Hill, and saw no evidence of vein formation at all; in fact, I saw less indication of such a form in these mines than in any I ever visited. I saw no evidence of fissuring in Ruby Hill whatever.

TRINITY COUNTY has had an excession of population in a number of miners from Yuba, Nevada, and Placer counties, who express the opinion that the basin of the Trinity will contain some of the most profitable deep gravel mines in the State, when water is brought in.

THE Gold Hill tailings mill, now being built, has on hand some 60,000 or 70,000 tons of tailings ready to begin upon. The large park pan will work 30 tons per day.

THE INAHO (Grass Valley) mine has made a partial clean up, not touching the batteries of \$25,000 from 6 days run with 35 stamps.

FUEL AT VIRGINIA.—Nut pine wood retails at Virginia and Gold Hill for \$16 per cord and coal sells at \$20 per ton.

THE EVERLASTINO mine, according to the *Calaveras Citizen* is having new machinery put upon it, capable of hoisting 1,500 feet.

Raising and Moving Brick and Stone Buildings.

We presume that very few of the thousands of persons who daily stop to examine the work now in progress for raising the brick building on California street, in this city, formerly occupied by Mooney's bank, are aware of the fact that the apparatus by which this work is done is a California invention; yet such is the fact, and a most valuable one. It was invented and patented in 1853, by Messrs. Steen and Torquet, and built at the Vulcan Foundry. In December of the same year it was employed, for the first time, in raising the brick building on the northwest corner of Montgomery and Commercial streets, then known as King's Banking House.

Since that time it has been employed in raising over 500 buildings of various dimensions, in this city—more than two-thirds of which were brick or stone. The largest block of buildings ever raised by it was that on Montgomery

in the final elevation of the most distant portion of the most extensive range of buildings to which the apparatus has been applied. There is not only a perfect uniformity of motion, but an entire absence of friction, so that there can be no jar as is always the case with the screw process.

The principle on which the machinery is worked is that of hydraulic pressure. The rams are placed in connection with the presses, which stand at intervals of twelve feet, beneath the walls of the building to be raised, all being connected by a continuous copper pipe of great strength, through which the water is forced into the presses, which is again connected with a battery pump, worked by gearing in such a manner that the labor of four men will produce a power equal to ninety-five tons to each press. The number of presses may be indefinitely increased, the same labor sufficing for them, and serving to elevate the most extended range of buildings, the only difference being in the rate of speed at which the block is raised. Any slowness in this respect may be readily obviated by increasing the number of pumps, and with them, of course, the amount of labor.

It will be readily understood that the pressure of the water in the various presses raises the rams, and with them, gradually and simultaneously, the entire building. Nothing can be more uniform or steady in its action than the gradual raising of water to its proper level, and hence it is impossible that any power can be brought to bear upon the elevation of foreign bodies, which shall raise them with less friction or eccentric motion than this.

This invention, which is now the property of the Messrs. Stratton Brothers, is purely the result of California ingenuity, and was never taken out of this city until it had been employed on something like 100 buildings. The original machinery, we believe, was shipped to Chicago, at which city it was first introduced outside of San Francisco.

COMSTOCK YIELD.—Wells, Fargo & Co's agent at Virginia, tells the *Enterprise* that the shipment of gold and silver hulsion from the Comstock mines to this city, New York and elsewhere, through the Virginia agency alone, amounts to the sum of \$2,500,000. Where are the croakers who say there is no money in mining operations.

THE BELOHER mine with its big dividends has a chance to increase them still more. Recently some exceedingly rich ore has been struck on the 1300 ft. level, well to the south of the mine. The ore is extremely rich in silver and free gold. Surely the Comstock beats any other in ever found or likely to be found.

BORAX has been found in Oregon, 37 miles south of Crescent city. The borate of lime is said to be found in huge boulders, weighing from two to three hundred pounds each, imbedded in the clay and gravel formation from the surface of the ground to the talcose slate bed-rock.

WEST MOUNTAIN DISTRICT.—Utah is the locality of a late strike of an immense body of copper ore. It is in the Confidenoc mine, from which three men have taken 50 tons of ore in three weeks, which runs from 14 to 56 per cent. copper.

NEW HOISTING MACHINERY for the Raymond & Ely mine has been shipped from this city. Owing to the great depth of the late strike in the mine now works are necessary before ore can be hoisted from it.

GALVESTON, TEXAS, is making a fuss over the fact of sending to England direct some \$75,000 in Mexican silver, which was received from Chihuahua via San Antonio and Austin.

CLARKVILLE MINERS, in Oregon, anticipate a good season and a large amount of gold dirt has been shipped. Times are reported as being lively.

street, known as the Braunan Buildings—125 by 175 feet in dimensions, and two stories high. These buildings were raised so as to admit of putting another story underneath. The loftiest building ever raised was the American Exchange, which was five stories high, and 60 by 80 feet on the ground. During the time it was being raised over 300 persons were constantly lodged in the hotel.

The greatest elevation to which any building has been raised will be reached by the one upon which they are now at work, which will be raised 26 feet, admitting of one full story and a half story basement. Several buildings have also been moved short distances from their original foundations—one, the Prescott House, corner of Pacific and Kearny streets, 65 by 75 feet on the ground, was moved back, 32 feet. Some 20 or 25 buildings have been raised to a sufficient height to admit a full story underneath; but most of the buildings, to which the invention has been applied, have been raised to conform to the changed grades of the street, etc.

Among all the buildings that have been raised not one has sustained even the slightest injury. This is attributable, in addition to the care exercised, to the perfect regularity of the movement,—so uniform that the most accurate regulator could not show a second's difference

Mining in Central Nevada.

A correspondent of the *Bulletin*, writes from Mill City, Humboldt county, as follows: The country adjacent to this place comprises nearly all the active and productive mining districts in Humboldt county. From what I have been able to learn during a late visit to many of the leading camps I should judge that this pursuit, without the excitement and mistakes that formerly attended it, is now fairly prosperous throughout this region of country. It is everywhere noticeable how different this business is being conducted at present from what it was during its earlier stages. The miners, after the subsidence of the speculative mania, being left to their own resources went to work and have since accomplished far more than when money was furnished them in the most lavish manner. It is true few mills are now being erected or towns built up, while population counts less than half of what it did ten years ago. But this reduced number are scattered through the mountains and all at work, not crowding into the town idling away their time or running over the country locating worthless claims, as was the case then. With the collapse that came about eight years since these non-producers were compelled to abandon the country and the towns prematurely forced into existence, soon after hastened to ruin. Then followed a few years of general inaction, after which the miners, finding they could no longer get money to help develop their claims, set to work and began opening them up in a small way themselves.

Industry and Economy Better than Capital.

Persisting in these efforts the miners soon found themselves working into an easy and even independent position, their lodes well prospected and sometimes quite thoroughly opened without the sacrifice of the major part to secure pecuniary aid. Being forced to help themselves the men have become good practical miners and placed the business on a permanent and self-sustaining basis. If never another dollar should come from outside, this industry would go on and flourish in the Humboldt region. Through the schooling they have had, the most of these men know how to open their claims properly, are good judges of ores and understand the best methods for reducing them.

What is Done With the Ores.

The larger companies have their own mills or furnaces and, of course, reduce the most of their ore at or near their mines, only those of an extremely high grade being shipped elsewhere for sale or reduction. Among the miners of limited means the richer portion of the ore being selected, some send them to Reno or other mill in the neighborhood to be worked on owner's account, or sell them outright to the millmen, the smelting ore going to the furnaces, of which there are a number in this part of the State. In some cases they are shipped to San Francisco to be sold to the Selby Smelting Works or to the agents of English or Eastern buyers, or perhaps sent directly to Swansea for sale on commission, an advance having first been obtained. Occasionally a company of miners will have found having a small mill or furnace of their own with which to reduce their ore on the ground, or a set of arrastres for crushing the gold-bearing rock. As it is only the high grade material that will pay for being disposed of by the above methods, considerable quantities of low and medium quality ores have accumulated at some of the mines, there to await more mill or cheapened transportation and reduction. The most of the ore here is of a refractory character, carrying lead, antimony and sometimes iron, copper and other base ingredients. Much of it therefore requires to be smelted or to be thoroughly roasted if managed by amalgamation. That from the Arizona, Rye Patch and other leading mines is sufficiently free however to be reduced by the Washoe pan process. A number of smelting works, some of them on an extensive scale, have been erected in this vicinity, but nearly all failed of success at first owing to the inexperience or mismanagement of those undertaking to run them. Generally the crude furnaces put up and operated by the miners themselves have done better than the largest establishments, though the latter, under improved management, are, for the most part, doing better now than at the start. Of the ore extracted the large companies, who take out a good deal, about one ton in thirty is shipped away, the proportion with the small companies being at the rate of one ton in four or five. In value this shipping ore ranges from \$150 to \$500 per ton, and will average perhaps \$250. Under this economical mode of proceeding the miners of Humboldt are gradually getting their claims into good working shape, while the most of them are at the same time making fair wages, and the practice of running into debt abroad or raising money by the sale of their ground, once so common, is now generally avoided. For the past year or two the aggregate wealth as well as the population of the country has been slightly on the increase.

In the Battle Mountain District,

Lying on the eastern border of the county, the prevailing ore is an argentiferous galena, much of it rich in both lead and silver. There are also many free ore-bearing lodes and a number of rich cupriferous veins in the district, the latter carrying carbonate, oxides and native metal. Two or three English companies own and have been operating there for several years

past, smelting and shipping the ores. Baffled by the many obstacles incident to the country, they have heretofore met with but a moderate success, though their condition has been steadily improving and their prospects are now considerably excellent. There are a number of mills and furnaces at Battle Mountain, some of which have remained unemployed most of the time since they were erected; but the entire number are likely to be run with profit this coming summer.

Other Districts in the Humboldt Country.

Lying adjacent and on either side of the Humboldt river is a tier of mining districts, all of which abound with gold and silver-bearing lodes. Some of these have been thoroughly prospected and a few quite extensively worked, the exploration made proving a large percentage of them to contain valuable deposits of the precious metals. On the north side of the river we have the Central and the Winnemucca Districts, each containing two or three well-opened and promising claims, while on the south side lie the God Run, the Oro Fino and the Sierra, the last two lately consolidated, and further west the Santa Clara, Star and Buena Vista Districts stretching south in the order named along the easterly slope of the Humboldt range. In the Star District are the Sbeha and the Da Sota mines, worked in a limited way with a view to prospecting the lodes and the extraction of the more accessible ore, the best of which is sent to market, the bulk being retained for future concentration or reduction. Near these mines is a deposit of gray antimony that has been worked for the past two years, the ore being sent in small quantities to San Francisco.

A few miles further south is located the Arizona mine, which for the past three years has been turning out bullion at the rate of over half a million per annum. The ore from this mine and that of the Silver Company, consolidated three years ago to avoid further litigation, employ three mills carrying ten stamps each, and crushing an aggregate of thirty-five tons per day. The ore is worked in pans, and without roasting, the use of the Aiken furnace, erected here some time since, having been discontinued. This ore yields at the rate of about \$35 per ton besides the sulphurets, and the mine is yielding large and steadily increasing profits. Lying in the same neighborhood are the North Star, Iuskip, Potosi, Crystal, and Eclipse lodes, all more or less developed, and the most of them now being worked with good results. These mines are all in the Buena Vista District, to the south of which, in the same chain of mountains, are situated the Sacramento, Relief, and several other districts, in which a good deal of money has been spent without any satisfactory returns. At present but little is being done in that section of country. Lying on the westerly slope of this range is the Echo District, one of the earliest organized in this region, and the locality of

The Rye Patch Mine,

Attracting more attention just now than any other in the Humboldt country, or perhaps, in Western Nevada, outside of the Comstock group. The property is a promising, and, in fact, a valuable one, whether developments made warrant the late advances in the price of its stock, being another question. As a paying investment it would seem preferable to anything on the Comstock, except Crown Point and Belcher, though less available, perhaps, for speculative purposes. This mine is situated near the base of the mountain, whence the plain slopes gradually west to the railroad, four miles distant. The lode, or rather ore belt runs N. E. and S. W., pitching to the N. W. at an angle of 45°. The foot-wall is porphyry and the hanging-wall calcareous slates. They are widely separated, standing over 100 feet apart. The space between them is filled with clay, porphyry, quartz, and ore; the latter being distributed in chutes or chimneys throughout the vein matter, and not, as smaller lodes, occurring in a continuous and unbroken stratum. The ore bodies stand near the hanging-wall and barely reach to the surface, undergoing in all cases rapid linear expansion below. The croppings are slight, and carry but little ore, but can be traced for a long distance. The mine has been opened by an inclined shaft sunk in the vein matter to the depth of 100 feet, the hoisting being done with a horse-wheel. A little below the surface a mass of ore was met with which proved to be 150 feet in length, and holds in depth as far as the shaft has been carried downwards. This was mostly a chloride ore and ran under the stamps from \$50 to \$60 to the ton. A drift carried with the lode from the bottom of the shaft, opened up another ore chute of still higher grade and of about 15 feet in thickness, neither the length nor depth of which has yet been ascertained. Another drift started near the northerly end of the stoping and pushed west, encountered, when in some twenty feet, another heavy stratum of ore, of the black sulphureted variety, and in a much higher grade than either of the others, milling from \$90 to \$115 per ton.

This bonanza has been cut into latterly for a distance of 12 ft. without wholly intersecting it, nor has its extent in any direction yet been determined. Minor bunches of ore have been struck at other points between the walls, though the three described, are the only important bodies yet met with. That others of still greater magnitude will be reached when the lode comes to be opened up in depth is probable, many affecting to believe that explorations will show this to be another Comstock. That the ore occurs here under conditions very similar to what they do in the great Washoe ore belt, there is no denying, and should these

bonanzas prove persistent in depth, or he followed by others in case they are cut off, the analogy would be sufficiently strong to raise great hopes for this mine.

At present two mills are engaged and preparations being made for running a third on the Rye Patch ores. One of these establishments, belonging to the present company, is located on the railroad, four miles from their mine. It is nearly new, having been erected on the site of the mill owned by the former proprietor, burnt up two years ago. It carries ten stamps, and has attached to it a Stetefeldt furnace, not now in use, the ores having lately become so pure that roasting is dispensed with. They are crushed dry, and worked up to 80 per cent. of the pulp assay, the bullion turned out being from 975 to 985 fine. At this mill are worked the second class ores, running about \$80 per ton, the higher grade being sent to Genaca's mill at Winnemucca, with whom a contract has been effected for reducing 200 tons per month. The ores reduced here are roasted in an Aiken furnace, and average something over \$100 per ton. The Oroana mill, near Rye Patch, will soon commence running on these ores, after which the product of bullion from this mine will exceed \$2,000 per day.

But sixteen men are employed here under ground, the ore being easy of extraction. A tunnel has been started, which will intersect the ledge at a considerable depth, securing drainage and further facilitating ore extraction.

Sage Brush for Fuel.

Sage brush fuel is used here for generating steam, it being found much cheaper than wood, though the Railroad Company deliver the latter at the rate of \$7.50 per cord. Sage brush is also used in the mills at the Arizona mine, there being enough of this material both here and in the vicinity of the Rye Patch to last for many years.

BENICIA CEMENT WORKS.—The Benicia Tribune is indebted to the courtesy of Mr. Gilmora of the Benicia Cementworks, for a sight of the interior of those huge smelting furnaces, etc., etc. We lack space to give our readers, at a distance, even a crude idea of this manufacturing establishment. Suffice it for the present, to say, that the site covers 10 acres of ground immediately on our bay. Vessels of large tonnage load at the wharf, at all stages of the tide. The mill is propelled by a 16-horsepower steam engine; six huge furnaces and two runs of stones, turn out 125 barrels of cement daily of 300 lbs. each, when running. Each ton of rock produces six barrels of cement. Six tons of coal and coke are required daily to run the works. The cement, when ready for shipment, is placed upon a railway leading from the mill to the warehouse and wharf. A huge warehouse 300 feet or more in length, is used for storing empty barrels, and another of nearly the same size is used for a shipping warehouse. When in full blast fully one hundred men are employed in the works and in the quarries. The reported sale of the works to a San Francisco Company for \$25,000, has not yet been consummated.

HOESAO TUNNEL—CURIOUS OBSERVATIONS.—The direction of the draft through the Hoesao tunnel and the central shaft has been changed by the warm weather. During cold weather the draft was through the tunnel and up the shaft. On April 29th, as the thermometer reached a temperature of 62°, the circulation decreased to nothing and reversed its course, passing down the shaft and out at the portal east. This change is taking place according to temperature every day. During the night the draft is upward through the shaft, and during the day, as the air becomes warm, the same process takes place as above mentioned. The results of a downward draft give interesting information. A light can be seen the entire length of the shaft, a depth of 1,030 feet. The timbering is visible one-half the distance down, giving a more frightful cast to the notorious place than ever before. The daylight always penetrates to the bottom of the shaft, a fact which has never before been recorded. The progress made at the central shaft, west heading, for the month of April, 1873, was 163 feet, the best work ever done on the tunnel.

THE OLD SPOONROCK MINES.—We are glad to hear say the *Virginia Enterprise*, that the old Spoonrock gravel digging at Spoonrock gravel diggings at Johnstown, on Gold Canyon, are panning out well. Two miners who have been prospecting about these famous mines for some weeks, last Monday sent to the Carson Mint 2½ pounds of gold as the result of their labors. Old Washoeites will remember that in these diggings in the early days the miners there used to take out handfuls of gold—with spoons. Spoons were the only tools required. Any man who went there with plenty of spoons and set to work was sure of a pile. It was from this fact that the diggings took their name "Spoon" and "oro," meaning literally spoon gold.

THE COST OF BUILDING STEAMERS.—According to a recent article in the *Philadelphia Ledger*, the cost of building steamers in this country of our own iron has lately been reduced from fifteen to twenty per cent., so that the additional expense of such vessels over British ones of the same capacity is only between ten and fifteen per cent. Cases are cited to show that this difference is more than made up by the superior strength of the vessels. There is no doubt that in the quality of their iron, our shipbuilders have an advantage over those of England; and in view of the disasters that have lately occurred, the extra price ought to be cheerfully paid to insure greater strength and safety.

The Calistoga Mines.

Gold, silver, quicksilver and coal are now mined near Calistoga. The *Tribune* of May 17th has the following: During the past week the work on the various mines in this vicinity has been vigorously prosecuted. The Yellow Jacket Company now have a tunnel in 55 feet, and a shaft 24 feet in depth. Some of the ore taken out is of marvelous richness, and the average quality of it is much above the first prospects. We have just heard of a rich and extensive coal discovery, which was made some two or three weeks ago, but which has been kept quiet until the present time, until the discoverer could take steps to secure a title to the land on which the mine is located. The discoverer is Nathan Smith, of Coho Valley, and the mine is situated about twenty-two miles from Calistoga, two miles from Siegler Springs, and five miles from Harbin Springs. It is in a cañon, with high mountains on each side, the coal being found in layers, or strata, a few feet apart, and running into the mountains on both sides of the cañon. The first vein opened was an inch thick on the surface, but soon increased to two feet in width. The coal is easily worked, being soft and much resembling Welch coal. Some of it has been tested in a forge and found to weld iron as well as any coal in the world, and after hurrying leaves little or no slag. A gentleman from San Francisco, who has been many years in the coal business, states that it is equal in quality to any foreign coal, and will bring as high a price in the market as the best. It is the only coal yet found in California which can be used in the forge. The extent of the deposits is not yet known. Mr. Smith has secured one hundred and sixty acres, according to the special Act of Congress in relation to coal lands, but the veins doubtless extend far beyond the limits of his claim. The Lower Lake road runs within two miles of the mine, and the means of transportation to Calistoga are comparatively easy. At the present time, without additional facilities, it is estimated that the coal can be hauled to Calistoga by freight team for eight dollars per ton. As the present price of a like quality of coal is twenty-two or twenty-five dollars per ton, by the cargo, this will leave a handsome margin. We consider this discovery more valuable than any gold or silver mine in California. The coal is easily worked, it being estimated that from four to six tons per day to the hand can be taken out, and when once out it is ready for the market—no machinery, no crushing, no smelting, or any other expensive or laborious process. We have several specimens of the coal, which may be seen at this office.

The Great Western quicksilver mine (formerly the Gem), which is located about fourteen miles from Calistoga, over St. Helena Mountain, has been worked with thirty hands for more than a year, and there is now sufficient ore on the ground to occupy six months or more in the working. The company are about erecting a furnace and the other necessary appliances for getting out the metal, the material for which, amounting to several hundred tons, is now passing through Calistoga. Buildings are being erected at the mine for officers and men, and, when the furnace and other machinery is ready for operation, which will be in about sixty days, the working force will be increased to 100 men. The mine is now in the hands of men of wealth, who are abundantly able to develop it to the fullest extent. The stock is not in the market. The numerous other mines in this vicinity are making good progress.

MINING IN THE VICINITY OF BOZEMAN.—Prospecting in the foot-hills around and contiguous to Bozeman has demonstrated the fact that we are now surrounded by the precious metal, and we have no doubt that the success of the miners engaged in developing the mines of Bridger cañon will induce others to thoroughly prospect the foot-hills, which have produced fine colors, and that it will lead to the opening of mines that will pay better wages than the laborer can obtain from the usual employments found in an agricultural community. The low price of grain produced last season, has to some extent crippled the farmers, so far as to the employment of help at the wages then demanded by laborers, and we are satisfied that the laborer can find more remunerative wages in the mines near Bozeman. The placer mines of Bridger cañon have been thoroughly tested, and the result has been highly satisfactory to those engaged in their development.—*Courier*.

A SINGULAR FORMATION.—A singular formation was struck in the Burns' mine, now being worked by Bruce Lee on Gold Flat, a day or two since. They have a fine ledge and are taking out good rock. The other day a workman, seeing a streak of rich looking sulphurets in the top of the drift, thought he would follow it a short distance. In a few moments he struck into a cavity which was lined on the inside with the most beautiful quartz crystals, and at the base of these crystals the sulphurets found to be very rich. The little cave which he struck glitened as though its walls were wrought in diamonds.—*Transcript*.

Such cavities in quartz lodes are not of very frequent occurrence, but they are not so uncommon as to be singular. Several crystallized cavities have been struck in the Eureka mine and one or two, we believe, in the Idaho. Our quartz expert says that the striking such cavities is a good sign, and that in the case described by the *Transcript*, Mother Nature has simply left a letter down in the bowels of the earth for Bruce Lee telling him that he has a true vein.—*Grass Valley Union*.

MECHANICAL PROGRESS.

Going Back on Compound Engines.

A large amount of "naval science" has lately been expended in scientific journals, on both sides of the Atlantic, to prove the great economy of compound engines for use in sea-going steamers; but after all that has been said and written, and notwithstanding the many costly experiments that have been made, there seems to be a growing disposition to go back to non-compound engines with expansion gear capable of a very high cut-off. A writer in *Engineering* asks—"If such good results are obtainable from using two vessels for expansion, why is not the number increased?" The same writer further says: "In my little experience I have found that in nearly every case where great economy was attained by substituting new boilers and engines, the result may be invariably traced to the adoption of a higher pressure of steam, and consequently to a greater expansion of the work done; and I question whether such economy might not have been obtained by merely having new boilers."

The *Engineer* of April 25th, in speaking editorially upon the same subject, says: "For some years we have persistently pointed out that the economical results obtained at sea with compound engines were not due to the fact the engines were compounded, but solely to the use of high pressures and a fair amount of expansion. Experience has proved that a pressure of about 60 lb. is the highest that is advisable to use at sea, because no boiler which is safe with higher pressures has as yet established for itself a character which will warrant its general adoption on ship board. It has been abundantly shown that 60 lb. steam cannot be expanded with advantage much more than five times. A ratio of expansion to six and even ten times has been tried with this boiler pressure, without any benefit as regards saving in fuel, and with a direct loss as regards the increased size and weight of engine required."

Bearing these facts in mind—and they are facts, as proved by hundreds of engine-room log-books—we have over and over again asserted in these pages that just as good results can be obtained from non-compounded marine engines as from compound marine engines, if only the makers will design their engines with due regard to the necessity for strength of parts, and will take proper care to proportion and set the propeller properly. In the face of all this the building of compound engines has progressed apace, and we have not been backward in illustrating and describing the best compound engines made by the most eminent firms. We feel certain, however, that the compound engine is used now only because it is the fashion to use it. It is essential to its permanent success that boilers should be worked at sea with pressures of at least 120 lb. on the square inch, rendering a ten-fold expansion possible. But such boilers, and the engines which will suit them, will be found very different machines from the ordinary modern compound engine. They will be found to require extremely delicate manipulation to get a first-class result out of them commensurate with their cost and the perfection of design and workmanship which they must possess. Whether such engines will ever meet with fair treatment, or be popular with sea-going engineers, time alone can prove. Mean-while, we hold to our opinion that compounding is unnecessary, and a source of direct loss, while the available practical pressures and rates of expansion are retained. For a long period we have stood almost alone and unsupported. Our views have been denounced as old-fashioned, and we have been accused of holding opinions subversive of true progress. At last, however, the tide begins to turn, and we have no little pleasure in calling the attention of our readers to the fact that the Montreal Steamship Company (the Allan line) have determined to give a fair trial to high-pressure steam expanded in one cylinder.

The British Admiralty are still, however, continuing their experiments, and the latest proposition is to substitute the compound, three-cylinder engines of the *Junina*, with a single cylinder, within which shall be trunks for the center cylinders; the inner one to be worked with full pressure, and the two outer ones to receive the exhaust, the one from the other. It is suggested by the opponents of the compound engines that it would be more economical to fit an expansion gear to each of the original cylinders, capable of a very high cut-off.

LIMIT TO EXPANSION OF STEAM.—At a late meeting of the Manchester, (Eng.), Scientific and Literary Society, as reported in *Engineering*, a discussion took place on the practical limit of the expansion of steam and the Society pretty generally agreed upon the proposition offered by Mr. McNaught that it was possible for the expansion of steam to be carried too far. When we have expanded steam to six times its volume we have got all out of it that will be of any benefit. Beyond this point there was no economy, because the back pressure not only lost its value, but operated against any economical result. If more expansion was wanted, the piston should be enlarged, and that would increase the prejudicial operation of the back pressure.

Comparative Tests of English and American Rails.

A number of experiments have lately been made at Joliet, Ill., to test the comparative strength of American and English rails. A "John Brown" (Eng.) rail taken from this Chicago and Alton railroad after it had been in use only 13 months, and rejected as being too soft, was taken, with one of the Joliet Iron and Steel Company's rails, to the steam hammer in their works (the blow of the steam hammer being equal to fifteen tons) and the following test made:

The "John Brown" rail was placed under the steam hammer, on bearings twelve inches apart, and struck three blows, when it cracked on the head, the crack diverging from each side of the point where it was struck. A Joliet rail was then placed under the hammer, in the same manner as the other, but with the head (or T) downwards, and was struck two blows on the flange, then turned over and struck eight blows on the head. The deflection was considerably more than that of the "John Brown" rail, but not a crack was visible.

The length and weight of the two pieces mentioned above were equal, and can be seen in the company's office at Joliet.

This test shows the great superiority of the American rail. Another test was made between the rails made by this company and those of several English companies, with the following results:

"John Brown" (Sheffield)—First piece struck one blow on top and turned, and broke first blow on the flange.

"John Brown" (Sheffield)—Second piece broke first blow on the top.

"John Brown" (Sheffield)—Third piece broke first blow on the top.

"Atlas" (Sheffield)—First piece broke first blow on the top.

"Enderdale" (Sheffield)—First piece broke first blow on the top.

"Joliet" (American)—First piece struck two blows on top, then turned and struck twice, bending it 3 1/2 inches in 24 inches of length, and broke it with the 3d blow on flange.

The same hammer with which the former test was made was used in this test. The steel of the Joliet rail was found to be very fine and close, entirely free of checks.

The great superiority of the American made rails, if those of Joliet are a type, must inevitably secure their general use, in preference to rails of inferior quality, and it is to be hoped that ere long every American manufacturer of rails will attain to that high state of perfection which will not only enable them to successfully compete with foreign manufacturers, but to gain for themselves a high reputation, and secure railroad companies against the heavy loss of property which they have sustained in many instances, together with the wholesale slaughter of human beings, whose names have been recorded in the many lists of killed and wounded by railroad accidents caused by "a broken rail." Let us have no more broken rail accidents. Railroad companies, test the rails you intend to run your trains over, and be sure you have such as will secure you from heavy losses of property and public indignation, then we will be able to say truthfully that railroading is a success. Passengers, it is your business to know what kind of rails you trust your lives upon.

THE FRACTURE OF CAST IRON PIER CYLINDERS.—Mr. J. C. Trautwine, in a communication to the *Journal of the Franklin Institute* on the fracture of cast iron pier cylinders, says: It is not, perhaps, generally known to the profession that cast iron cylinders, composed of sections bolted together through inside horizontal flanges and filled with concrete, as is usual when employing them for bridge piers, etc., have, in several instances in the United States, split or cracked asunder, entirely around their circumference, under the influence of severe cold weather. The reason of this, I presume, is that the outer and more exposed cylinder tends to contract to a greater degree than the inside and more sheltered concrete, and that the hold which the inside flanges have upon the solidified concrete in which they are imbedded prevents the contraction from taking place without rupture of the cylinder. Unless suitable means be applied to prevent this, the efficiency of such cylinders may be much impaired. It has been suggested that an inside lining of vertical wooden staves, projecting inward as far as the flanges do, will be an effective remedy. Other methods will no doubt present themselves. My object is merely to give greater publicity to an important fact.

HOW TO PUT IN BOLTS.—If there is a thing which is utterly detestable to look upon, by a strict observer and one who has a general knowledge of what is right, it is to see the heads of bolts driven down below the surface of the wood. The bolt has a certain duty to perform, and where that duty is the securing of a piece of iron to wood, or wood to iron, if the head of the bolt sets firmly upon the wood, and the nut is firm upon the iron, it is all that is required; but when we commence to draw upon the bolt until the head sets below the surface of the wood, that moment we commence destroying the fiber of the wood and aid the premature rotting at that one point, for no matter how nicely painted, or how neatly put up, there will soon be a cavity for the retention of a few drops of water. This alone would be enough to condemn the practice to say nothing of the other results it produces.—*Carriage Journal*.

SCIENTIFIC PROGRESS.

Changes in River Beds.

In a report on the subject of a water-supply for the village of Yonkers, New York, published in the January number of the *American Chemist*, Prof. J. S. Newberry furnishes some interesting facts on the geology of river-beds, that will be of general interest. He says: "It is probably known to you that most of the draining streams of all the region between the Mississippi and the Atlantic are now running far above their ancient beds. This fact was first revealed to me by the borings made for oil in the valleys of the tributaries of the Ohio. All these streams were found to be flowing in valleys, once deeply excavated but now partially filled, and in some instances, almost obliterated. Further investigation showed that the same was true of the draining streams of New York and the Atlantic slope. For example, the valley of the Mohawk, for a large part of its course, is filled with sand and gravel, to the depth of over two hundred feet. In the Hudson the water surface stands now probably five hundred feet above its ancient level—the old mouth of the Hudson and the channel which leads to it being distinctly traceable on the bottom nearly eighty miles south and east of New York. The excavation of these deep channels could only have been effected when the continent was much higher than now. Subsequently it was depressed so far that the ocean-waters stood on the Atlantic coast from one hundred to five hundred feet higher than they now do. During this period of submergence the blue clays in the valley of the Hudson—the 'Champlain clays'—were deposited, and the valleys of all the streams were more or less filled."

AUREOLA, OR THE BRAIN ATMOSPHERE.—A new theory is propounded to explain why one happens to think of persons he has not seen for years just before meeting them. A similar phenomenon often happens, when one has impressions of the death of friends, who may be thousands of miles away, and subsequently learn that they died at that particular moment. A writer in the London *Spectator* thinks that there is a brain atmosphere extending through space, more subtle than the air or even the interplanetary ether. [May it not be that the theory is true?] As the undulations of the air occasion sound, and the undulations of the ether give the impressions of light, so the undulations of this brain atmosphere may convey impressions between sympathetic minds.

The theory is a very ingenious one, and there are certainly many facts which it will explain satisfactorily, but these different atmospheres must be curiously constituted, if so many different vibrations moving from so many different directions, do not interfere with one another.

INVESTIGATION IN SPECTRUM ANALYSIS of the Bessemer flame, by Prof. Roscoe, evidences that when the blow begins the flame is scarcely luminous, a mere glare of red, giving a very faint spectrum, if any. In about four minutes from the time the blast is let on, a flashing through the spectrum of the sodium line may be noticed. In about a minute and a half after this change, we discover lithium, and then potassium. As the process continues, the flame becomes intensely luminous, owing to the silicon becoming incandescent. Then it gradually changes, and becomes slightly purple, and in a few seconds passes to nearly the same color as at first. The first spectrum is an exceedingly simple one, but the last is complex, containing as many as thirty-three lines. The lines disappear in the inverse order of their appearance, and when the green band becomes invisible, the blast should be shut off, and the metal cooled.

THE MYSTERY OF POLISHED SURFACES.—The polish of which the surfaces of certain bodies, such as steel, the diamond, and other precious stones are susceptible, is an evidence at once of the limited sensibility of our organs and the unlimited divisibility of matter. This polish, is produced, as is well known, by the friction of emery powder or diamond dust, and, consequently, each individual grain of such powder or dust must leave a little trench or trace upon the surface submitted to such friction. It is evident, therefore, that, after this process has been completed, the surface which presents to the senses such brilliant polish, and apparently infinite smoothness, is, in reality, covered with protuberances and indentations, the height and depth of which cannot be less than the diameter of the particles of powder by which the polish has been produced.

SUBSTITUTE FOR QUININE.—A French apothecary has discovered an excellent and very cheap substitute for quinine, in powdered laurel-leaf. The leaves of the laurel (*Laurus nobilis*) are slowly dried over the fire in a close vessel, and then powdered. One gramme (15 1/2 grains) is a dose, and is taken in a glass of cold water. The drug so taken produces no bad effects, and soon, it is said, breaks up the most obstinate intermittent fevers.

PROF. VOGHT records an instance of what may be called self-cannibalism. He cut in two a male cricket, and immediately the fore part, probably experiencing a sensation of emptiness in the ventral region, turned upon the hinder part and devoured it!

Electric Theory of Boiler Explosions.

An explosion occurred some time ago at one of the most celebrated manufactories in the world, the Hardmanschen works, in Chemnitz, Germany. The causes which led to this disaster are very mysterious; the boilers were entirely new, and burst on the second day of their use, with such violence that the whole building was blown to pieces, causing the loss of many lives. The calamity happened, also, immediately after the fires were started, and before there could have been a very high pressure in the boilers.

The phenomena of a thunder storm, which are well understood, may throw some light upon the subject. The warmer the day the greater is the evaporation of water from the earth, and consequently the more violent are the flashes of lightning. If we consider what a mass of water evaporates in a day, in a large boiler, the volume of water while undergoing this change, increases seventeen hundred fold in bulk, we may easily infer that large quantities of electricity are also set free, and the boiler becomes filled with the fluid.

The coating applied to the external surface of the boiler generally consists of oil colors, or else some kind of varnish, and when first applied is very bright, but soon tarnishes from the deposit of carbon or soot from the flames. If the paint or varnish is accidentally scraped off, there still remains this carbon deposit, which prevents the electricity from connecting with the earth. As soon, however, as the fireman carelessly removes this loose film, a full electrical connection is made with the earth, which occasions such a rapid production of steam that the exhaust pipes are unable to convey it from the boiler fast enough, and an instantaneous explosion follows, as was seen in the case of the boilers of the Hardmanschen works.

MINERALS IN LAVA DEPOSITS.—It is a remarkable fact that the lavas of Vesuvius contain a greater number of minerals than, perhaps, all others in the world. Haüy mentions that, of three hundred and eighty simple minerals known to him, no less than eighty-two have been found on Vesuvius; of these several are peculiar to the locality. Sir Charles Lyell expresses the opinion that those have not been thrown up in fragments from some older formations, through which the gaseous explosions have burst, but have been sublimed in the crevices of lava, just as several new earthy and metallic compounds are known to have been produced by *fumeroles* since the eruption of 1822.

IS A WHALE A FISH?—Prof. N. S. Shaler furnishes some notes on the habits of the whale, founded partly on information furnished by Captain John Pease, of Edgerton, Mass. In the course of the notes, the Professor says that the Captain is positive that a trace of hair is to be found within the skin of the right whale; for if the fresh skin were scraped, the inner section will show such a trace. If this whale, remarks the professor, is the descendant of a land mammal, we should expect to find just such a trace. Then, too, a sperm whale's tooth is shown in Nantucket, which has two fangs, and it is stated that the other teeth of the whale to which this belonged, had, also, two fangs. The Professor suspects here a case of reversion.

CAPILLARY ATTRACTION.—At a recent sitting of the Academy of Sciences, M. Chevreul gave an account of some experiments illustrating what he calls capillary affinity. He made a paste of white lead and water, and another of white lead and linseed oil, and placed them in separate tubes. Above the oily paste he placed water and above the watery paste oil. The oil in the latter case displaced the water, but water did not displace the oil in the former. In corresponding experiments with clay and pure kaoline it was found that water would in each case drive out oil, but oil would not drive out water.

PHOTOGRAPHIC EFFECTS BY PRESSURE ALONE.—Another remarkable experiment of M. Carey & Co., is the production of latent photographic pictures by simple pressure. He prepared and sensitized a plate, and then having written upon a sheet of paper with a style, so that the letters may stand in some relief in the dark, presses this paper on the sensitized leaf; turning this on the application of the ordinary iron developer, he obtains a picture of the words. Here mechanical pressure alone (the light being excluded) effects the result. The experiment seems to support the erasive theory of light.

THE POISONOUS ACTION OF METALS.—That the metals have a poisonous action in proportion to their "atomic" weights, and, inversely, as their atomic heats, was enunciated as a law by M. Rabuteau, a few years ago. This was verified in a large number of instances. He has recently experimented with calcium and potassium, the atomic weights of which are forty and thirty-nine respectively, and finds, as he expected, that the effects of injection of these substances into the veins of animals are very nearly equal.

A SENSITIVE PLANT.—Weltwitsch tells of a plant, an oxalis, growing in Angola, Africa, which is so sensitive that it closes its leaves on hearing (so to speak) a footfall in its neighborhood.

MINING SUMMARY.

[California Mining News on page 352.]

Nevada.

ELY DISTRICT.

MEADOW VALLEY.—Pioche Record, May 25: This noted lode, old mine—more properly speaking, 3 mines, with 3 distinct bolting works, has again come to the front to establish her claim to the first rank in the rich mineral interest of Ely District. Persistently have her shafts been sunk until each have obtained depths far exceeding the expectations of the community, and from the respective stations drifts have been run to prospect every foot of the extensive vein owned by the company. Number 3 shaft is 328 ft. deep, number 5 nearly 700, and number 7 approaching 1,000. The lay of the country rock at these great depths is uniform and the formation quartzite. The first recent strike in No. 3 was made in the cross-cut from the shaft at the 8th station, and within 14 ft. of the latter; but the most important was at a depth of about 60 ft. below the 8th station immediately in the shaft, at which point the dip of the ledge and the angle of the vein on the opposite side. Thence down the vein ore has continued in the shaft, showing on its east and west sides, and giving reasonable assurance of permanency in depth and extent. But another and very important strike has just been taken in what is favorably known as the Old Black shaft ground, from which, in times past, the richest ore ever found in the district was taken out. This ground is nearly about mid-way between No. 3 and No. 5 (Summit) on the 7th level, (630 ft.,) and the strike promises to rival the richest ever before made in Ely District. Our authority for the foregoing is perfectly reliable. She is shipping now about 35 tons of ore per day.

RAYMOND AND ELY.—This great mine is now being run with reduced force, there being at present time about 200 men employed. Development on the 8th level is being prosecuted with energy, and the indications are extremely promising. Some rich ore has been taken from the 8th level, but no great amount will be hoisted from it for some time, or until certain necessary connections with the 7th level are completed. Ore is now being hoisted from the 7th level principally, but some comes up from the 5th and 6th, in which there are still good ore bodies. The main shaft is now 63 ft. below the 8th level.

PIOCHE.—Full forces are engaged in this well-known mine and 4 to 5 tons of good ore are being hoisted daily. An average of 30 car sample taken during the month of April is \$266.77. The developments are highly satisfactory. There are now 150 tons of No. 1 ore on the dump.

PORTLAND.—The drift from the bottom of the main shaft to connect with the winze is being pushed ahead vigorously. A few ft. more drifting will make the connection, but the rock is very hard and progress is slow.

BOWERY.—Main shaft 325 ft. down. The drift east from the bottom is in ledge matter, with improving prospects. The drift from the second station is looking splendid and improving fast.

CHIEF EAST.—The drift east from the main shaft is looking exceedingly well. Have been compelled to suspend the work, as the air is very bad. Now sinking the main shaft to connect with the Chief of the Hill, which will take about ten days. This connection will give both mines good ventilation.

ALPS.—Continued improvement is the report due this mine this week. The ore bodies are strong, and the richness of the ore is unquestioned.

FRACKER.—The main shaft is down 120 ft. and the west drift is now in 60 ft. The mine looks well in all parts, and is improving fast.

EXCELSION.—No particular changes to note. A drift is being run from the bottom of the new shaft, 280 ft. down, to connect with the winze from the old works. The indications are fair.

CHARMAN.—Work continuing with satisfactory results. No particular change to note, excepting that the indications are improving as depth is attained.

MAZEPA.—Work will soon be resumed in this mine. Fine and rich ore bodies were exposed when work was suspended, a few days ago.

AMADOR TUNNEL.—Some good ore is being run through the tunnel, and the ore breasts are strong.

PACIFIC TUNNEL.—The tunnel is now in over 1,100 ft., and drifting is being prosecuted on the last ledge struck, or ledge No. 3. Ledge No. 3 promises, without exaggeration—and we have personally inspected it—to be one of the richest and most extensive mines in this district. The ledge is now 4 ft. between the walls, and both walls are as smooth as a planed board. The ore is coming in very rich, one certificate of assay before us, given by John Cahill, returns \$1,278.11 to the ton. The average of about \$900. From 6 to 7 tons of ore found in the tunnel will not fall far short of \$250 to the ton.

SILVER PEAK.—Ore is being extracted, 210 ft. down on the incline, from east and west drifts. The ledge matter is 4 ft. in width, of which there are from 18 to 20 inches of very rich ore. The walls show regularly wherever exposed. Car sample assays average about \$150 to the ton.

WASHINGTON AND CREOLE.—The east and west drifts from the 540-ft. level are both in ore. The west drift has been run about 25 ft., and the east about 35. Both drifts are run on the ledge, which varies from 18 inches to 2 1/2 ft. in width. The ore assays from \$1,000 to \$4,000 to the ton—the majority of the certificates before us showing an average of about \$900. From 6 to 7 tons of ore are being hoisted daily. We were shown a large number of specimens with horn silver all through them. The prospects of the Washington and Creole are more brilliant than ever before. There are now about 300 tons of very rich ore on the dump.

BROOKLYN.—There is a new mine near the Portland, which is attracting much attention at the present time. A fine body of ore has been struck, which as much resembles the richest ore of the Bowery as one pea does another, and the assayer's returns of its ore are invariably high.

MONTANA.—Still sinking the main shaft, which is now 160 ft. deep. It is expected that the shaft will cut the vein at about the depth of 225 ft., and from the character of the vein exposed in the 100-ft. level, it is probable that the developments at that depth will not be second in importance to anything yet struck, even in this richest of silver-bearing districts.

HUMBOLDT COUNTY.

BOLIVIA DISTRICT.—Silver Star, May 24: Frank German, who is engaged in mining in Bolivia District arrived in town on last Saturday, and gives the most flattering reports of that district. Several companies are engaged in mining in that district, and each and all of them are extracting ore which assays from 35 to 60 per cent. of metal. The Baker Company, on the Tidal Wave mine, have developed an immense mass of ore, and with a limited number of miners can produce 150 tons of 40 per cent. ore monthly. Work has been commenced on the lead over the mountains to Oreana, and is being prosecuted vigorously. It is expected that in 60 days wagons can reach the mines and load at the dumps. Bolivia is, beyond all doubt, the richest and most extensive copper region yet discovered on the coast, a fact which its ore shipments will prove to the skeptical as soon as communication is opened with the railroad.

MONTANA.—We learn from C. W. Scheidel, of the Marysville (Cal.) Foundry, that the Rye Patch Company have agreed to supply the Montezuma mill, near Oreana, with ore from the Butte mine, and that it is the intention of the owners of the mill to increase its capacity from five to ten stamps. Mr. Scheidel visited the mill and examined it with a view of ascertaining what machinery may be necessary for making the proposed enlargement. The mill and smelting works are

owned by General Connor, of Salt Lake, by whom they were purchased last fall.

GOON YIELD.—The average yield of ore from the Botte, worked at the Rye Patch mill, during the last month, was \$118 per ton. This mine looks splendidly, and large bodies of ore are in sight. The Superintendent, Charles Hoffmann, started to Reno last Wednesday, for the purpose of leasing the Auburn mills, at that place, to work ore from the Butte mine.

HENNING.—G. W. Holt, who recently leased the Pioneer mill, has also leased the Henning for one year. Work was commenced on the mine on last Tuesday, under the new management, with a force of fourteen men. J. D. Gelselman, formerly Night Foreman in the Arizona, and an experienced miner, has charge of the Henning.

TRINITY.—Wm. Woolcock, who for several years has been Foreman of the Manitowish, has commenced work on his own hook on the Trinity mine, in Star District, of which he is one of the principal owners. Bill is a good miner, and as he entertains a good opinion of the Trinity, we shall expect to hear of good results from that mine shortly.

WASHOE.

ALAMO.—Gold Hill News, May 24:—The shaft is 100 ft. deep, and still sinking in the ledge, making good progress. A drift north is started 80 ft. from the surface, to prospect the ore body in that direction.

ARIZONA AND UTAH.—The east drift is now in 64 ft. from the shaft. The rock is hard, but works well, and considerable water is encountered. It will take about 2 weeks yet to reach the ledge.

BEZELER.—Daily yield 600 tons from the 1,000, 1,100, 1,200, and 1,300-ft. levels. The 1,200-ft. level, connecting with the main incline, being properly graded, and the car-track laid, ore commenced passing out that way for the first time this afternoon. The main incline is now down 135 ft. below the 1,200-ft. level, and sinking with fair progress in hard, dry rock; 35 feet farther will take it far enough to open a station for the 1,300-ft. level. The main drift south at the 1,300 ft. in 174 ft. from the Crocker point line, and has over 400 ft. to go in or to reach the incline.

BUCKEY.—Daily yield about 20 tons, keeping the Hope mill running. The ore sections continue to look well, and at the south portion of the upper level especially.

BALTIMORE CONSOLIDATED.—Drifting both north and south is being done at the 225-ft. level in the ore, which holds out well, and promises considerable extent. The timbers for the construction of a dump, are on the ground, and as soon as the dump can be built, ore extraction and milling will commence. The water is out of the lower part of the mine, and the drift west at the lower or 450-ft. level is being driven ahead for the main ledge, to which the good ore found a couple of weeks ago, are evidently belongs.

CROWN POINT.—Daily yield, 500 tons, principally from the 1,300-ft. level, which holds out splendidly and gives promise of continuing its present yield for many months to come. The face of the east cross-cut from the 3d floor above this level, is still in fine ore. The ore in the fifth floor cross-cut is 27 ft. in width, and a raise from the cross-cut with the winze from the level above, giving a good circulation of air. Both winze and raise have passed through first-class ore all the way.

CON. VIRGINIA.—Main shaft down 435 ft. Rock works well, allowing of good progress. The main drift north at the 1,167 ft. level from the Gould & Curry is also progressing well. When connection is made with the shaft and drift the mine can be worked to advantage; not before.

CHOLLAR-PORTER.—Daily yield 140 tons from the old ore sections, assays averaging \$35 per ton. Prospecting going ahead as usual. Ore sections show no particular change.

CALDENIA.—Drift and winze connections completed, giving good circulation and work goes ahead advantageously. No particular change to note.

FRANKLIN.—Work was commenced at the south end of this mine day before yesterday with the view to ascertain if the Baltimore deposit at the north end extends through to that point. The old tunnel, which was run ten years ago, is being cleaned out and retimbered for that purpose. It is 600 ft. in length, and cut a body of low grade ore 12 to 15 ft. in width, and assays as high as \$30 or more to the ton. That ore can be made to pay at present wages and cost of milling.

GOULD AND CURRY.—Work going ahead actively in this mine at present, about 80 men being employed. The main incline progresses slowly, owing to much water, giving the pump all it can do. The incline is very hot. The south part of the old mine, several levels down, shows considerable low grade ore, favorable to better developments eastward. The main drift south at the 1600-ft. level is driving toward connection with the Savage as fast as possible. Some promising low grade ore is met with in cross-cutting from the north drift of the 10th level.

GLOBE.—Work in the winze progresses slowly on account of the great heat and lack of ventilation. Some very good ore is encountered within the last day or two, which promises to develop into a valuable deposit.

HALE AND NORRIS.—Daily yield 45 tons, all from the lower mine. The repairs to the shaft are completed. At the lowest level the ore breasts show improvement, and cross-cut east from that level are being driven ahead to reach the east vein.

IMPERIAL.—The drift in the incline is completed, and deeper sinking progresses well. Some very good bunches of ore have been met with the last few days in the winze between the 1600 and 1700-ft. levels.

INDUS.—North drift in the ledge, progressing as usual. The ore shows a greater proportion of silver than heretofore, containing more silver than gold.

JUSTICE.—The winze at the south portion of the mine is still sinking and the incline ore. The main incline at this point is down 75 ft., the quartz encountered showing improvement, and some water coming in. The main south drift at the 400-ft. level is driving along as fast as possible toward connection with the south mine.

JULIA.—Sinking the main shaft for another station, and running the south drift, progressing very well. The ledge widens and the south end is better developed, and the general prospects of the mine are very favorable.

NEVADA.—The proposed new working shaft east of the present workings is commenced. Meanwhile work goes ahead in the incline, sinking in good milling ore, the ledge being 4 ft. in width. Hoisting works will be erected over the new shaft as soon as the incline, and the grading is in progress down that purpose.

OPHIR.—New shaft below the 1465-ft. level sinking at a satisfactory rate of progress, the ground met with being soft porphyry. The faces of the cross-cuts at the 700 and 1300-ft. levels show improvement.

OVERMAN.—The main drift west as well as the north and south branches of the same, are progressing fine in grand and good quality, with occasional seams of quartz. The level corresponds with 100-ft. level of the Belcher mine and will prospect the southern portion of the Comstock about 400 ft. deeper than any other mine does at present.

WOODVILLE.—Daily yield nearly or quite 40 tons, which is more than enough to keep the small 40 and 100 mill and the road over the mountains running. A fine body of ore is accumulating on the dump and at the mill. The ore sections are looking finely, and north of the shaft especially so.

YELLOW JACKET.—Drifting east at the 1600, and north and south at the 1400-ft. levels progressing as usual, with no particular change to note.

SILVER HILL.—Daily yield about 50 and 60 tons. Average assay about \$40. The main north drift at the first level shows considerable improvement in the quality of the ore, and plenty in sight in the mine to keep the mill running for many months.

SIERRA NEVADA.—The northerly ore section and the gravel stopes show improvement, otherwise no change to note. The mill runs steadily and does very good work.

SEQUESTERED ROCK ISLAND.—The Co. recently purchasing this old established mine, have started in actively to develop it. They have commenced cleaning out the old tunnel and shaft preparatory to erecting first-class bolting-works, and opening out the mine properly. Years ago, when the mine was being worked, a drift east from the shaft, 100 ft. from the surface, at a distance of 75 ft. cut through a ledge of silver ore of the regular Comstock stamp, 28 ft. wide, and assaying \$30 per ton on the average.

WHITE PINE.

GOOD NEWS FOR ROBINSON.—White Pine News, May 24: We are credibly informed by D. T. Elmore, that renewed activity will be the order for the coming summer at Robinson District in the mining interest of that section. Negotiations are now being made for the purchase of the fine, new mill owned by this English company, at Mineral Hill, and, as soon as the bargain is closed the work of boring down and removal will be commenced. We also learn from the same source that our old friend, Thomas Cahill, formerly an assayer in this place, has been appointed superintendent of the company, vice Mr. Elmore resigned.

HIDDEN TREASURE.—This remarkable and erratic deposit of ore has been the means of adding thousands of dollars of wealth to the world, and is far from being exhausted yet. There are some 30 or 40 men employed on the different cuts, shafts, and inclines, and a fine quality of mineral is being constantly extracted. Now, a vein of quartz is being worked near the old shaft, from which so much valuable mineral has been extracted, which seems to be going down in an easterly direction. Some 300 tons of good ore is lying on the dump at this mine, and the cost of raising it to the Wheeler tunnel, with indications of soon striking an ore body 600 ft. below the surface workings described above.

EDGAR.—This valuable mine is steadily producing its quota of fine milling ore, from which the Maubatten mill is being supplied. The drift, mentioned by us some time ago, as being run to connect with the main ledge, has been completed, and the cost of raising it to the surface is much lessened by the fact. Thirty-six tons are being hauled from this mine daily, which is sufficient to keep the mill running continuously. The rock is of high grade, and will mill from \$60 to \$80 per ton.

WARD HATCHER.—This mine is not being worked at present, as the ore is slight having been extracted, and no prospecting going on.

REBERT AND AUBURN.—A force of 130 men are in the employ of this company, all of whom are working on it, in various portions of the property. The Peers Chamber is still showing finely, and a shaft is being sunk revealing ore continuously. The Stanford mill is constantly being run on ore from this chamber alone, and prospecting pushed ahead in other localities owned by the company. The tramway is laying idle, Captain Drake preferring to employ teams until alterations of some kind are made for the better on the former.

MANRATTAN MILL.—This serviceable and bullion producing institution appears to run as well as any mill ever erected. It has been in operation, years ago, it was purchased and put up at its present site, where it seems to do just as good and complete work as ever before. It consists of 22 stamps, is adapted either to wet or dry crushing. The ore being run through at present is from the Edgar, belonging to the company, and is said to be of splendid quality.

PERSISTENT EFFORT.—We know of a man who has been constantly employed for the last 3 years and over, driving a tunnel into a hill near Swanses, about 2 1/2 miles from this place, and, unaided by any one, has completed over 400 ft. into the solid rock. During the course of the work he has extracted a large quantity of valuable smelting ore, which goes high in gold.

SUNBEAM.—On the occasion of our visit to this mine, of which we have reported before, we were impressed with the extent and grandeur of the surface croppings. The ground is stripped a distance of 300 ft., running due east and west, and the croppings are traceable the same distance, and are from 4 1/2 to 7 ft. in width. A shaft has been sunk some depth in the ground, but we did not descend it, there being no work going on at the present time. From surface showing we are confident it is one of the biggest mines in that locality.

Montana.

COAL.—Deer Lodge City Independent, May 17: Several hundred tons of excellent coal have been taken from the banks near the summit between Blackfoot and Helena during the past winter. These mines are now sufficiently developed to demonstrate their value. The veins are of good width, and the quality of coal equal to any found west of Pennsylvania. As yet the demand is light, but it is increasing, and will soon reach several thousand tons per annum.

MOOSE CREEK.—Laping & Moreau started up their arastras last week on the ore from the Canada ledge. They have several hundred tons of quartz on their dump and over 100 at the arastras. Dickey & Parks are also running a set of arastras on the ore from the Canada ledge. Both of these companies will make money rapidly this summer, as they have splendid quartz, and plenty of it. Their machinery is also first-class and of great capacity.

PIONEER.—The Pioneer Co. cleaned up the sum of \$3,200, last Saturday, the proceeds of 9 days' work. This Co. will start on one or two times next week, and will take out an average of \$5,000 per week during the summer. Several cleanups were made last Saturday, but we have not learned the proceeds. By the first of next week nearly all the claims will be running, and Pioneer will turn out more gold and more in proportion to the number of men employed than any other mining camp in Montana.

OUR PLACE.—New North-West, May 16: New discoveries have been made within a mile of the place which go 3 cents to the pan. Several new claims have been staked, and we understand a company, representing capital sufficient to thoroughly prospect and successfully work the large bar on the northeast of town, will be organized in a short while, when work will be commenced in earnest. Experienced miners here already predict that the new mine will be one of the richest in the Territory, as soon as sufficient developments are made to prove the richness and extent of the mines. The miners in Bridger canon are actively engaged on their water ditches, and will soon be prepared to wash out the precious metal. We understand that a gentleman owning an interest in one of the claims on Bridger bar last week sold out for \$500 in cash, the purchaser being new also one of the owners in the claims.

QUARTZ CREEK.—New North-West, May 17: The McKinney Brothers & Co. own and work the flume at the mouth of the creek; the claim is worth \$4,000. Boh Miller is "going it alone," one mile above them, on Long Bar; has good ground, if it was opened. Ruston Biggs has been prospecting on the south side of the creek, below McGrath's store, with strong symptoms of pay until the water run them out. The new flume company put in 50 ft. of flume this week, and have 100 ft. more to run to reach bed-rock. "Buffalo Bill" & Co., on 34, are hunting another \$32 nugget. Bart & Co., on 41 have got 4 or 5 dollar diggings on high rock.

GOVERNMENT CLAIM.—W. W. Jones, one of the owners of the claim in Gold Canon informs us that they have commenced washing the ground drifted during the winter and cleaned \$700 in the first 2 days. They have yet about 2 weeks washing of winter drift dirt not probably as rich as this. This company, consisting of W. W. and T. W. Jones and John and David James, of the Government, have been prospecting on the Gold Canon four years now and doing well all the time, the ground averaging about \$25 to the set of timbers. The streak is 45 ft. beneath the surface.

THE CABLE LEAD.—Col. W. F. Chadwick and L. H. Hershfield, Esq., of Helena, were in town this week and made a proposition to Mr. S. Cameron of the Cable Lead, asking to the development of that property by a San Francisco company. We learn from Mr. Cameron the

proposition contemplated the bonding of the lead to the San Francisco for one year from January 1, 1873, during which time the company would expend an amount up to \$50,000 in opening and working it, with the privilege of purchase at a stipulated sum if they deemed it desirable. Mr. C. did not accept the proposal as he has arrangements made which he deems more favorable. In 10 days he will commence sluicing the surface of the lead with hydraulics and expects to bare and take out sufficient ores to at least keep the mill employed one third of the time.

GERMAN GULCH.—Mr. Foster, merchant in German Gulch, was in town Thursday purchasing goods for the spring business. No mining of any consequence has yet been done, the nights being so cold as to freeze the water. It is anticipated all will get to work by the 25th inst. There are 14 companies (4 Chinese) in the gulch, owning from 2,000 to 5,000 ft. of ground each and the ground is good for 10 years more as profitable mining as in the past.

Utah.

WELLS, FARGO TUNNEL.—Alta City Independent, May 19: This tunnel is intended to strike the lead, and is within 30 ft. of it; the ore in the Pyatt is of a fine quality, and still getting better. The mine is owned by the Tunnel Co., and J. A. Varnes the gentlemanly Superintendent, informs us that work will be resumed by the 15th of June. The showing of ore being so good, there is no indication of the ore they strike in the tunnel will far exceed anything produced for some time, in this camp.

HERMAN.—This tunnel has been pushed forward by energetic men, until their labor was rewarded on Friday last, by striking 3 ft. of ore, which assays well and is growing fast.

WELLSFORD.—Which shows an 8 ft. vein of ore going \$100 in silver and 70 per cent. lead. This mine is gradually getting better and there will be a large amount of high grade ore extracted as soon as shipping facilities increase to their summer dimensions.

AMERICAN FORK DISTRICT.

GOLDEN GATE COX.—Alta Independent, May 22:—The Mammoth Golden Gate Consolidation, which is 2 1/2 miles distant and separate mines, all situated in American Fork Canon, except the Golden Gate proper, which is located in this district, and has a tunnel in 30 ft. on the ledge, in limestone; shows a crevice of 5 ft. between walls of porphyry, ochre, and galena ore, with every indication of opening into a large body soon. Cutting formation shows croppings for 1,500 ft. This mine is being vigorously worked.

HARRIET LANE LONE.—In limestone, 4-ft. crevice, 25 ft. down; shows chlorite ore assaying as high as \$500.

MARIETTA LONE.—Also in limestone, 2-ft. crevice, 20 ft. deep. Shows chlorite and decomposed ore, some of which has assayed as high as \$1,130 to the ton.

MONTANA LONE.—Between lime and yellow clay. Pyrites and galena were coming in when the work stopped. Deep, crevice 18 inches, blue and yellow clay. Pyrites and galena were coming in when the work stopped.

ROSE OF JUNE.—In limestone 100 ft. down, crevice 14 inches. Chlorite and decomposed ore.

LONE STAR.—In quartzite, 2-ft. crevice. Burnt brown, decomposed ore, 12 ft. down.

MARY LONE.—In quartzite, 18 ft. deep, 6 ft. between walls; shows good milling rock and burnt brown crevice matter. Splendid prospects.

ROSE LONE.—This mine is down 14 ft. in limestone, and shows 4 ft. of a crevice of brown, decomposed ore, and some heavy galena. The walls are well defined.

New Incorporations.

The following companies have filed certificates of incorporation in the County Clerk's Office, S. F.:

CONSOLIDATED REFORMA LEAD AND S. M. Co., May 26. Object: To mine in the Reforma Bolebrano Lead and Silver Mines in the Santa Maria Mountains, District of Mexico, Territory of Lower California, Republic of Mexico, and to smelt, and dispose of its ores and metal. Capital stock \$200,000, in shares of \$100 each. Trustees: J. T. Atwell, Jacob Schuber, Wm. G. Badger, Wm. Mocker and Samuel Irving.

OCCIDENTAL IRON MINING AND SMELTING CO., May 24. Object: To mine for iron and other metals in the State of California, smelt the same and manufacture iron and steel. Directors—James H. White, Joseph Trench, A. H. Stout, A. R. Gunnison, A. Everett Ball, George W. Metzler, and George Treadwell. Capital stock, \$3,000,000. Amount of stock actually subscribed, \$200,000.

ARIZONA PROSPECTING AND MINING CO., May 24. Location: Pictorial, Arizona and New Mexico, and in the States of California and Nevada. Directors—C. J. Hutchinson, John O. Morrison, Jr., Robert Cushing, Louis Franconi, and M. P. Sinton. Capital stock, \$15,000, which has been subscribed.

GOLDEN SWAN CO., May 24. Object—Gold Hill Mining District, Storey County, Nevada. Directors—J. D. Fry, A. K. P. Harmon, Robert F. Morrow, Benjamin F. Sherwood and J. H. Robinson. Capital stock, \$50,000.

SAMANTA GOLD AND SILVER M. Co., May 26. Location: Ely Mining District, Lincoln County, Nevada. Trustees—J. M. Van DeMark, J. F. Atwill, John Middleton, George W. Lincoln and Wm. Pihott. Capital stock, \$1,000,000, in shares of \$50 each, of which \$100,000 has been subscribed by the Trustees.

MOUNT ST. HELENA G. & S. M. Co., May 26. Location: Napa County, Cal. Trustees—O. S. Buckley, John Evans, J. L. Sanford, Alexander Badlam, Jr., and Richard Swift. Capital stock, \$800,000, in shares of \$100 each, of which the amount actually subscribed by the Trustees is \$50,000.

ARMY DAOMAR S. M. Co., May 26. Location: Little Cottonwood District, Utah Territory. Trustees—F. P. Beach, James Hetchens, Harvey S. Brown, J. G. Severance, and E. Cass Stickney. Capital stock, \$3,000,000, in shares of \$100 each, of which amount \$100,000 has been subscribed.

MOUNT ST. HELENA G. & S. M. Co., May 27. Location: Gold Hill Mining District, Nev. Trustees, H. Rosekrans, O. P. Hutchinson, H. F. Williams, Charles W. Rand and Isaac Edmund. Capital stock, \$3,000,000, in shares of \$100 each, of which \$50,000 has been subscribed.

Meetings and Elections.

PACIFIC SHELTING AND MINING CO., May 27. Trustees: R. N. Shackelford, (President), Thomas N. Holt, (Vice Presidents), H. F. Williams, C. R. Gresthouse and A. Craig. Secretary, J. M. Knight.

SILVER HILL M. Co.—At the annual meeting of this company at its office 419 California street, on the 26th inst., the following gentlemen were elected Trustees for the succeeding year. A. K. P. Harmon, W. S. Hobart, J. D. Fry, Martin White, and Chas N. Felton.

TIN ORE.—ANOTHER REPORTED DISCOVERY.—The Eureka (Nevada) Sentinel reports an alleged discovery of tin ore some 25 miles distant from that place. The discovery is said to have been made by "a leading scientist," who knows whereof he speaks. Full particulars, precise location is promised as soon as preliminary matters can be adjusted.

The Raymond & Ely mine has shipped during this month \$175,000.

Notes on the Honey-Making Ant of Texas and New Mexico.

(*Myrmecocystus Mexicanus*.—Westwood.)

[By HENRY EDWARDS.—California Academy of Sciences.]

The natural history of this very curious species is so little known, that the preservation of every fact connected with its economy becomes a matter of considerable scientific importance, and the following observations, gleaned from Capt. W. B. Fleeson of this city, who has recently had an opportunity of studying the ants in their native haunts, may, it is hoped, be not without interest.

The community appears to consist of three distinct kinds of ants, probably of two separate genera, whose offices in the general order of the nest would seem to be entirely apart from each other, and who perform the labor allotted to them without the least encroachment upon the duties of their fellows. The larger number of individuals consists of yellow worker ants of two kinds, one of which of a pale golden yellow color, about one-third of an inch in length, acts as nurses and feeders of the honey-making kind, who do not quit the interior of the nest, "their sole purpose being, apparently, to elaborate a kind of honey, which they are said to discharge into prepared receptacles, and which constitutes the food of the entire population. In these honey-secreting workers the abdomen is distended into a large, globose, bladder-like form, about the size of a pea." The third variety of ant is much larger, black in color, and with very formidable mandibles. For the purpose of better understanding the doings of this strange community, we will designate them as follows:

- No. 1.—Yellow workers; nurse and feeders.
- No. 2.—Yellow workers; honey makers.
- No. 3.—Black workers; guards and purveyors.

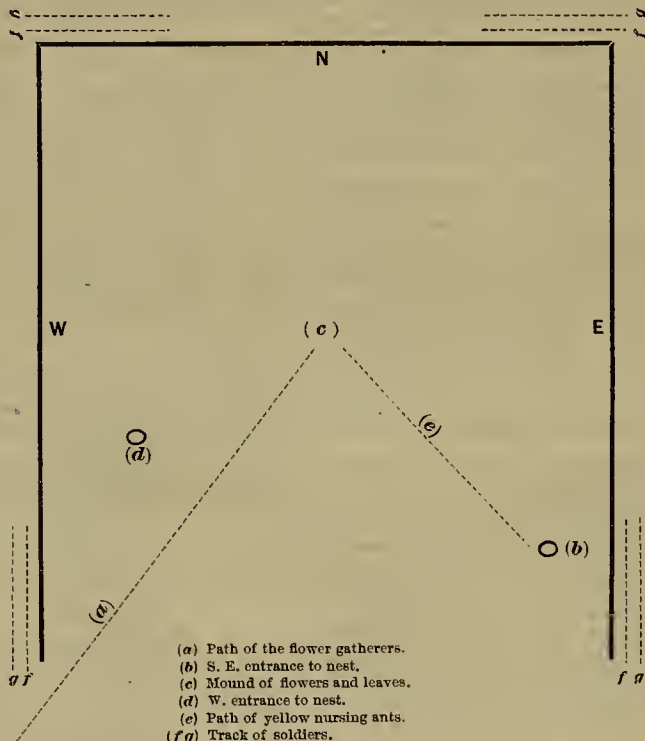
The site chosen for the nest is usually some sandy soil in the neighborhood of shrubs and flowers, and the space occupied is about from four to five feet square. Unlike the nests of most other ants, however, the surface of the soil is usually undisturbed, and but for the presence of the insects themselves, presents a very different appearance from the ordinary communities, the ground having been subjected to no disturbance, and not pulverized and rendered loose as is the case with the majority of species.

The black workers (No. 3) surround the nest as guard or sentinels, and are always in a state of great activity. They form two lines of defence, moving different ways, their march always being along three sides of a square, one column moving from the southeast to the southwest corners of the fortification, while the other proceeds in the opposite direction. In most of the nests examined by Captain Fleeson, the direction of the nest was usually towards the north; the east, west and northern sides being surrounded by the soldiers, while the southern portion was left open and undefended. In case of any enemy approaching the encampment, a number of the guards leave their station in the line and sally forth to face the intruder, raising themselves upon their hind tarsi, and moving their somewhat formidable mandibles to and fro as if in defence of their foe. Spiders, wasps, beetles and other insects are, if they come too near to the hive, attacked by them in the most merciless manner, and the dead body of the vanquished is speedily removed from the neighborhood of the nest, the conquerors marching back to resume their places in the line of defence, their object in the destruction of other insects being the protection of their encampment, and not the obtaining of food. While one section of the black workers is thus engaged as sentinels, another and still more numerous division will be found busily employed in entering the quadrangle by a diagonal line bearing northeast, and carrying in their mouths flowers and fragments of aromatic leaves which they deposit in the center of the square. A reference to the accompanying sketch will give a more clear understanding of their course; the dotted line (a) representing the path of this latter action, while the mound of flowers and leaves is marked (c). If the line (a) be followed in a southwest direction, it will be found to lead to the trees and shrubs upon which another division of the black workers is settled, engaged in hitting off the petals and leaves to be collected and conveyed to the nest by their assistants below. On the west side of the encampment is a hole marked (d), leading down to the interior of the nest, which is probably chiefly intended for the introduction of air, as in case of any individuals carrying their loads into it, they immediately emerge and bear them to the common heap, as if conscious of having been guilty of an error. A smaller hole near to the southeast corner of the square, is the only other means by which the interior can be reached, and down this aperture, marked (h), the flowers gathered by the black workers are carried along the line (e), from the heap in the center of the square, by a number of smaller yellow workers (No. 1), who, with their weaker frames and less developed mouth organs, seem adapted for the gentler offices of nurses for the colony within. It is remarkable that no black ant is ever seen upon the line (e), and no yellow one ever approaches the line (a), each keeping his own separate station and following his given line of duty with a steadfastness which is as wonderful as it is admirable. By removing the soil to a depth of about three feet, and tracing the course of the galleries from the entrance (b) and (d),

a small excavation is reached, across which is spread in the form of a spider's web, a net work of squares spun by the insects, the squares being about one-quarter inch across, and the ends of the web fastened firmly to the earth of the sides of the hollow space which forms the bottom of the excavation. In each one of the squares, supported by the web, sits one of the honey-making workers, (No. 2), apparently in the condition of a prisoner, as it does not appear that these creatures ever quit the nest. Indeed it would be difficult for them to do so, as their abdomens are so swollen out by the honey which they contain, as to render locomotion a task of difficulty, if not to make it utterly impossible.

The workers, (No. 1), provide them with a constant supply of flowers and pollen, which, by a process analogous to that of the bee, they convert into honey. The fact that the remainder of the inhabitants feed on the emphy thus obtained, though it is surmised, has not been established by actual observation; indeed with reference to many of the habits of these creatures, we are at present left in total ignorance, it being a reasonable supposition that, in insects so remarkable in many of their habits, other interesting facts are yet to be brought to light respecting them. It would be of great value to learn the specific rank of the black workers (No. 3), and to know the sexes of the species forming the community, their season

DIAGRAM OF THE EXTERIOR OF THE NEST OF MYRMECOCYSTUS MEXICANUS.



and manner of pairing, and whether the honey-makers are themselves used as food, or if they excrete their saccharine fluid for the benefit of the inhabitants in general, and then proceed to distil more. I regret that at this time I am only able to bring before the notice of the Academy, specimens of the honey-makers (No. 2), the other members of the community, except from Captain Fleeson's description, being quite unknown to me. It is, however, my hope that at a future meeting I may be enabled to exhibit the other varieties, and to give some more extended information upon this very interesting subject. The honey is much sought after by the Mexicans, who not only use it as a delicate article of food, but apply it to bruised and swollen limbs, ascribing to it great healing properties. The species is said to be very abundant in the neighborhood of Santa Fé, New Mexico, in which district the observations of Capt. Fleeson were made.

THROUGH FREIGHT.—During the month of April nearly 4,000,000 pounds of through freight went East from this State by the Central Pacific Railroad. Among this was 19,000 pounds of quicksilver, 45,020 pounds of borax, and 21,934 pounds of lead bars; ninety per cent. of all this went from this city.

The Virginia and Truckee Railroad Company are putting up telegraph poles on the line of the track, and through all the tunnels between Gold Hill and Virginia, for the new telegraph wire of the Company.

The Willamette Woolen Factory, Oregon, is running full-headed and finds good sale for the articles manufactured. They buy all the wool they can get.

The Phoenix and K. K. Mining Companies are said to be about effecting a consolidation.

Borax.

There are now three sets of borax works in operation in Fish Lake Valley, and this number is to be increased by another set which Mr. Nadeau is about to erect, and run by steam. Mott & Piper are doubling the capacity of their works, now equal to 4,000 pounds daily, by the addition of four new vats. These works are said to produce the best borax in the country, it being fit for all ordinary purposes when boxed for shipment. Though all of Nadeau's teams and many others are employed in transporting this product of the several borax works about Columbus to the railroad, many more are needed to supply the demand.

Besides considerable quantities at other works, Mott & Piper had on the 1st of the present month, some 12 tons on hand, which, with a large daily addition, will have to remain there several weeks before the present force of teams can remove it.

The borax business has proved extremely profitable, and in consequence prospectors are keenly on the lookout for new fields. Extensive deposits have recently been found and located at two or three different points in Death Valley, some 70 miles and more south of Gold

The Largest Clyde-Built Merchant Vessel.

On Saturday afternoon, says *Iron*, a magnificent screw steamer, named the *City of Chester*, built for Messrs. Inman, of Liverpool, was launched from the shipbuilding yard of Messrs. Caird & Co., Greenock. The vessel is the largest merchant steamer that has ever been built on the Clyde, and she is farther said to be the largest afloat, with the sole exception of the *Great Eastern*. The *City of Chester* is to be engaged in the Liverpool, New York, and Philadelphia service, and will take her station during the summer. Her dimensions are as follows: Her length, over all, is 458 feet; at water-line 425 feet; breadth (moulded), 44 feet; depth, extreme, 38 feet 8 inches; moulded, amidships, 36 feet, 4 inches; hold, 34 feet 9 inches; saloon deck, 7 feet 4 inches; lower deck, 7 feet, 6 inches; height of bulwarks, 4 feet; tonnage, gross, 4,800; under gear deck, 4,500; builders' measurement, 4,156. Engines, compound, high and low condensing, 800 horse-power. Boilers, 15 in number, with 30 furnaces. Accommodation is provided for 132 first-class passengers, and 1,310 third-class. No provision is made for second-class passengers. Her ship's company, properly so called, will consist of 44 seamen, 42 engineers and firemen, and 49 officers (navigation and engineering), and ship's servants, bringing the whole number up to 135. Her store of fuel will amount to 1,400 tons, and her cargo space will be sufficient for about 2,000 tons of merchandise. The speed desired to be obtained on the ocean service is about 17 knots per hour. The vessel is ship rigged. The keel of the *City of Chester* was laid in December, 1871, and the construction of a vessel of such large dimensions was so unusual in Greenock, that great interest was felt in her progress. When toasting "Success to the *City of Chester*," after the launch, Mr. J. T. Caird referred to the great and rapid advance which has taken place in shipbuilding and engineering science on the Clyde within the last forty years.

When his firm settled in Greenock, at that time they built a vessel of 500 tons, and were unable to find a purchaser for her for some years, owing to the general objection that she was too large. That vessel was the largest that had till then been built on the Clyde. Many years afterwards his firm built the *Atrato*, also larger than any of her predecessors on the Clyde, and now his firm had the honor of turning out the *City of Chester*, the largest yet built. It would be vain, however, to expect that she would remain for any length of time the largest vessel, for, at the farthest, two years would see her quite eclipsed in size. Messrs. Caird will immediately commence the construction of another screw-steamer for Messrs. Firmen, which will be 50 feet longer, and have 600 hundred tons more burthen than the *City of Chester*.

SPRUCE MOUNTAIN DISTRICT.—A correspondent of the *Elko Independent* writes as follows: "The furnace of the Starr King Mining Company is completed, and turning out hullion. It started up on the 5th inst., just three weeks from the date of laying the foundation. The furnace is running with every evidence of being a complete success; while the first two days' run has produced eighty bars of bullion, which is pronounced by experts to be of excellent quality. This, with the fact that this district has many excellent mines, guarantees to us a permanent and prosperous camp. The Starr King Company is making arrangements to put an extra force of miners in their mines (Grecian Bend and Home Stake), and will commence taking ore from the large bodies of fine gray carbonate which are in sight. There are now some twelve hundred tons of good paying ore on the company's dump.

The miners are anxiously waiting for the snow to disappear from the mountain sides that they may renew with vigor their prospecting and developing, as they are feeling more confident than ever.

The town of Starr King is increasing steadily, the houses being substantially built, which gives it an appearance of permanence.

When the new road, being graded, is completed we will have a daily stage direct from Wells."

The Caribou silver mine and reduction works, situated in Boulder County, about 40 miles northeast of Denver, considered to be one of the richest silver mines ever opened in the United States, has been sold to the Netherlands Mining Company, of Holland, for \$3,000,000. The net profits of the mine for several months past have averaged \$1,000 per day. The new company will immediately double the capacity of the mill. Experts from Holland and England reported from \$2,000,000 to \$4,000,000 worth of ore in sight, and the mine was worth \$6,000,000. M. A. Shaffenburg, of Denver, has taken possession of the mine, mill and tunnel, as agent of the Netherlands Mining Company.—*Ex.*

The Segregated Rock Island Mine, Gold Hill, has been sold, according to the *News*, for \$35,000.

COLORADO COAL MINES, it is stated, turned out over 100,000 tons last year.

COPPER ore has been found in the head of Brown's Creek, Trinity Co., Cal.

Mountain. There it is said to lie on the ground from one inch to a foot in depth, but containing a large percentage of borate of lime and other impurities.

One of these deposits is in the immediate vicinity of the spot where those '49 emigrants abandoned their wagons, which were subsequently burned by the Indians. It is doubtful whether these new and extensive deposits will prove of any immediate value to the locators, as besides their reported inferior quality, their location is in or near the center of a most inhospitable region and distant from any practicable thoroughfare.

However, we are inclined to think that many of the supposed obstacles in the way of the successful working of these deposits will disappear by actual trial. Notwithstanding the fact that so many unfortunate have perished of thirst in the terrible desert of Death Valley, we have it from good authority that water can be obtained almost anywhere in the valley within three feet or less of the surface.—*Inyo Independent*.

VIRGINIA CITY still gives employment to many large teams of ten to fourteen mules each, notwithstanding the railroad facilities for transportation.

COAL has been found in Lake County, Cal., six miles from Harbin Springs. The vein is said to be two feet wide and can be traced for half a mile.

A COMPROMISE of the suit between the Richmond and Enreka consolidated companies, at Eureka, was not effected as was anticipated and the case is now being tried.

ELY DISTRICT is just beginning to be prospected, an unusual number of new locations having recently been made.

USEFUL INFORMATION.

Spiritual Photographs.

Photographers are acquainted with several different ways in which secondary images, sometimes called "spiritual photographs," may be made. If a double picture is desired, take a sensitive glass-plate which has served its turn as a negative—as many paper positives as may be needed having been taken from it—the film of collodion or other prepared surface is removed from it, and it may then be used for a wholly new photograph. But it is found that unless great care be used, some faint traces of the former picture still remain, and these may appear as a sort of ghostly attendant upon the figure forming the second picture.

One photographer in endeavoring to utilize an old plate which had fulfilled its duty as a negative, could not wholly erase the image, wash or rub as he might; there was always a faint ghost of the person accompanying any subsequent photograph taken on the same plate. Dr. Phipps relates that a friend of his received at Brussels a box of glass plates, quite new and highly polished, each wrapped in a piece of newspaper; a lady sat for her photograph, taken on one of these plates, and both the photographer and lady were astonished to see that her likeness was covered with printed characters, easily to be read—the ghost of a political article, in fact. In this case, actinic rays had done their work before the glass was exposed to the camera.

By another mode of manipulation, a photographer may produce a ghost-like effect at pleasure; a sitter is allowed to remain in the focus of the camera only half the time necessary to produce a complete photograph; he slips quickly aside, and the furniture immediately behind him is then exposed to the action of the light; as a consequence, a faint, or imperfectly developed photograph of the man appears, transparent or translucent, for the furniture is visible, apparently through his body or head. With a little tact, a really surprising effect may be produced in this way. As a third variety, one negative may be placed in contact with another, and a particular kind of light allowed to pass through it for a time; there results a double picture on the lower negative.

Curiosities of Water.

There is no material substance whose transformations are more marvelous, and whose relations are more complex and extensive, than those of water. A recent writer says:

"You take in your hand a bailstone, and it rapidly changes into a transparent fluid, which gradually vanishes, only to reappear, during frosty weather, in dew-drops upon your window, where it resumes, in delicate ramifications, its former crystalline solidity. You place another under a bell glass with thrice its weight of lime, and it soon melts and disappears, leaving behind it four parts instead of three of perfectly dry earth.

You subject an opal to chemical analysis, and find it but a combination of flint and water, the latter being to the former as one to nine.

Of the alum, the carbonate of soda and soap which you purchase of your grocer, the first contains forty-five, the second sixty-four, and the third, from seventy to seventy-three and a half parts of solidified water.

The clay field which you plow contains a ton of water to every three tons of soil; nay, the very air you inhale in ordinary weather holds diffused throughout every cubic foot of its bulk fully five grains of rarified water, which no more wets the air than the solidified water wets the lime or the alum in which it is absorbed."

If beefsteak be strongly pressed between two sheets of blotting paper, it will yield nearly four-fifths of its own weight of water, while the experiments of Berzelius and Dalton prove that of the human frame, not excepting the bones, one-fourth only is solid matter, the rest being water.

Delton found, by experiment on his own person, that five-sixths of the food taken by day to repair the human frame is also water.

Of potatoes, again, no less than 75 per cent. is water, and of turnips, at least 90—a fact which, as has been remarked, "explains the small inclination of turnip-fed cattle and sheep for drink."

ARTIFICIAL CORAL.—This may be employed for various kinds of ornamentation. It is made as follows: To two drachms of vermilion add one ounce of resin, and melt them together. Have ready the branches or twigs peeled and dried, and paint them over with this mixture while hot. The twigs being covered, hold them over a gentle fire; turn them round till they are perfectly smooth. White coral may also be made with white lead, and black, with lamp-black mixed with resin.

When fuel is burned in an open fireplace, at least seven-eighths of the actual or potential heat passes up the chimney unused. About one-half is carried off with the smoke, one-fourth with the current which flows in between the mantel-piece and the fire, and the remaining loss is represented by the unburned carbonaceous matter in the smoke.

REMOVAL OF THE CEREBRUM FROM THE LOWER MAMMALIA.—Notwithstanding the fact that any serious injury to the cerebrum (the upper portion of the brain, and that of the reasoning faculties and will) in man is attendant with instant death, if the same portion of the brain of fish, reptiles, birds, even common domestic fowls, and all the lower mammalia, be removed they experience but very little diminution in their powers of movement. Carp and frogs continue to swim as well as before; a pigeon when abandoned in the air flies to the ground, setting lightly on its feet; whilst a rabbit runs away when irritated, performing these movements with no appreciable difficulty, and with only a slight evidence of weakness. The weakness becomes much more noticeable when the operation is performed on a dog, though it is less marked in proportion as the animal is a young one. An adult dog deprived of its cerebral hemispheres is, however, no longer capable of maintaining the erect position, though it can still move its legs freely whilst lying down.

A case of this kind attracted much attention at Woodward's Gardens, in this city, a few years since, where a what was called a "headless rooster" was exhibited for some months, for the gratification of the morbidly curious.

SCIENCES AND THEIR USE.—Where screws are driven into soft wood, subjected to considerable strain, they are very likely to work loose; and many times it is very difficult to make them hold. In such cases we have always found the use of glue profitable. Prepare the glue thick; then immerse the screw, and drive it home as quickly as possible. When there is some article of furniture to be repaired, and no glue is to be had handily, insert the stick, then fill the rest of the cavity with pulverized resin, then heat the screw sufficiently to melt the resin as it is driven in. Chairs, tables, lounges, etc., are continually getting out of order in every house; and the time to repair the break is when first noticed. If neglected, the matter grows still worse, and finally results in the laying by of the article of furniture as worthless. Where screws are driven into wood for temporary purposes, they can be removed much easier by dipping in oil before inserting. When buying screws, notice what you are getting; for there are poor as well as good kinds. See that the heads are sound and well cut; that there are no flaws in the body or thread part, and that they have good gimlet points. A screw of one make will drive into oak as easy as others into pine, and endure having twice the force brought against it.—*Ohio Farmer.*

GOOD HEALTH.

How to Make Fat Folks Lean.

One of the most corpulent persons ever known was Daniel Lambert, of the county of Leicestershire, in England, who weighed five hundred and twenty-eight pounds. Persons whose normal weight is from one hundred and thirty to one hundred and sixty pounds, not infrequently attain to the weight of two hundred and fifty to three hundred pounds or more. Barnum had a young girl on exhibition some years ago, whose weight exceeded four hundred pounds. But this increase of weight is not growth. Bulk is not necessarily development. Obesity means, simply, an accumulation of fat in the areolar tissue. Fat persons are often spoken of as being "very fleshy." Flesh and fat are very different articles; nor does flesh increase because fat accumulates. On the contrary, all abnormal accumulations of fatty matter are attended with corresponding diminution of flesh. Even the viscera—stomach, liver, heart, lungs, kidneys, etc., are smaller in fat than in lean persons or animals.

The immediate cause of obesity is defective excretion. Sedentary habits and constipating ingesta are the remote causes. Vital temperaments are more liable to accumulate fat than mental or motive ones; for the reason that the viscera of organic life are larger and nutrition more active. For this reason, also, women are more inclined to obesity than men, other things being equal.

A fat person cannot be a perfectly healthy person, for the reason that the process of fattening is merely the accumulation of effete matter. For this reason, too, very fat animals—which bring the very highest prices in the market, and are preferred by epicures—are much inferior to lean flesh in nutritive value.

Among the articles which predispose to corpulency are broths, soups, sugar, and all starchy preparations; the latter being the principal ones. It is for this reason that carnivorous animals are never fat. Malt liquors are conducive to plethora, and thus indirectly conduce to obesity.

The remedial plan is as simple as are the causes. Drink only water, and that only according to thirst. Drink nothing at meals. Avoid all thirst-provoking condiments. Use no animal food except lean meat; nor fine flour in any form whatever. Bread should be made of unbolted meal, and without any yeast or rising of any kind. Fruits may be partaken of freely. Milk, butter, cheese and sweet-meats should be avoided.

Equally important is abundant exercise; not irregular and fitful, but steady and persevering. Occupation is better than play, for the reason that it is apt to be more systematic and

persevering. Plain simple food and exercise will gradually work off the accumulated adipose matter, increase the volume of blood, restore the wasted muscles and viscera, and recover the normal state and size.—*Science of Health.*

Health.

Among our individual acquaintances, how few there are that appear to be in regularly fair health! Inquire of him who boasts that he "never had a sick day in his life;" this paragon, to find whom you must seek through hundreds, confesses to occasional "biliousness," or rheumatism, or coros. My experience, as medical examiner to the Craftsman's Life Insurance Company, daily shows to me what a hollow mockery is the six feet, and brawny shoulders, and rosy face, and "round belly with good capon lined." One is shaky with his two or three cigars a day, which he is not man enough to omit; another seems bursting with rosy cheeks and health, which numerous glasses of brandy daily for years has but heightened; and his neighbor is pale and sodden and shaky from his meagre beer, or his sour wine, or his comparatively infrequent whiskey drinks.

This one eats no meat, and that one no vegetables; one works in dark and stifled rooms, and, after years of toil, is healthy and vigorous. The other lives in the sunlight, and draws fresh air from heaven with pain and anguish. And the sturdy, who seems to defy death, falls dead in the street, while the puny lives to boast of his superiority! Vanity of vanity.

But notwithstanding that it is apparent that we know but little in comparison with what may be known, is it not well without any vain assumption, or pluming ourselves upon this little—will it not be well to see what we do know, and, by recognizing the general laws of things, to aim at obtaining some particular rules for our own guidance? Shall not the chemist render useful service by carefully analyzing the objects before him, even if his "ultimate principles" are still lying before, like "new worlds to conquer?" Shall not the optician strive to increase the power of his instruments, even though the increased power of the glass but discovers two stars where but one was noticed before, and far beyond the furthest brilliant point before seen in the distant heavens the doubled lens but shows new worlds still stretching further from man's earth, and yet as near to God's heavens?

May not we, straining our eyes, not with the telescope at distant worlds, but with the microscope at the wondrous formations in our own frames—more wonderful because made in the image of God and containing an indwelling spirit, which the largest race, and, in some respects, the most educated upon earth, consider to be part and parcel of the great Creator of all—may not we, reverently and happily, aim to benefit our race somewhat, by gathering up some of the few recognized laws of our being, and by looking at health, strive to see what it is, and how it can be best obtained?

REMEDY FOR CHOKING.—A correspondent writing from Mission San Gabriel, in referring to a method which we lately published, for removing an obstruction from a child's nose, by blowing through the mouth, sends the following experience in removing obstructions from the throat: Last fall a child in that neighborhood got a peach-stone into her throat, and was fast choking to death, when her mother took her up by the heels, held her head downwards, and almost instantly the obstruction dropped out upon the floor.

ANOTHER CASE.—But a few days previous to the date of the above-mentioned note, a lady came rushing into the post-office, at El Monte, with her child in her arms, and choking with a piece of meat in her throat. The wife of the Postmaster, recollecting the case of the peach-stone, immediately caught the child by the heels, gave it a pretty severe shake, when out came the meat, to the great relief of the agonized mother, and the saving of the child's life. Our correspondent very properly thinks such incidents are worthy of a cord in the Health Department of the Press.

THE PHILOSOPHY OF DEATH.—According to the Spiritualist, spirits and mediums, clairvoyants and seers, all agree very closely in the descriptions they give to the natural process called death. The vital forces first quit the feet and lower extremities of the body, and those who have the power of spirit vision see a luminous haze slowly forming above the head, and connecting with it by a shining cord. Gradually, as the vitality of the body diminishes, the cloud above assumes a distinct shape, and the spirit form of the departing individual is seen lying in a state of insensibility above the prostrate body. At last the spirit awakes to consciousness, the silver cord still connecting it with the body is severed, and the newborn spirit quits the house in company with spirit friends and relatives who awaited his arrival. The spirit friends are often seen before life has entirely quitted the body, which is the reason why the dying so often talk of seeing departed friends around the bed.

DOMESTIC ECONOMY.

STRAWBERRIES.—The best use to make of this delicious first fruit of the year, is to pick and serve them on the stems, if possible, letting each one bull them for himself as he puts them one by one into his mouth. This is the nearest thing possible to eating them in the field or garden, which, of course, everybody knows enough to do when he gets a chance. These plans will be mostly available only to those who raise their own fruit. Much of this fruit which is brought to market is coarse and sour, and really needs cooking to make it palatable. Still, this cooking should be very slight, as the flavor is evanescent. Remember this in making pudding sauces of strawberry juice.

Whether for cooking or not, they should never be washed, if it can be avoided. When it must be done, pour them, a few at a time, into a bowl of water, stir carefully with the fingers until as clean as necessary, skim out and lay on a sieve to drain, being careful not to muss them. They will hardly do to serve *au naturel* now. If for "sauce," hull them, putting them at once into the dish in which they are to be served, and sprinkling sugar upon them as you proceed. Handle them as little as possible, and that little as near to the time of serving them as may be. They are better picked before the sun is hot in the morning; but after that they should stand, with out being disturbed, until time to put them into sugar. The time they will need to stand in sugar depends on their sourness. The best kinds need little, if any, sugar, and that put on after they have been dished out—each one serving and suiting himself.—*Science of Health.*

WHAT WE DRINK.—The Hollanders are credited with being the largest consumers of coffee in the world, and, next to them, the Belgians; but we can furnish statistics to show that neither of them compare at all with California in this particular. The annual consumption of coffee, per head, in the various countries named below is thus given by Dr. Schlosser, a Holland statistician: England, 1½ pounds to each person; France, 2¼; Germany, 4; Denmark, 5½; Switzerland, 6; Belgium, 8½; Holland, 10½; United States, 7 pounds to each person. In 1868, we consumed in California 8,300,000 pounds of coffee. Estimating our population then at 500,000 it gives 16 3-5 pounds to each individual. But we have more than 100,000 Chinese and Indians who do not drink coffee; this leaves 400,000 consumers, with an allowance of 20½ pounds to each person; or nearly twice the quantity, per head, consumed in Holland, and nearly three times as much as in other portions of the United States. The English are notoriously a tea-drinking people, preferring it to coffee. So far, this year, England has imported from China no less than 140,000,000 pounds of tea. Besides, the extent to which coffee is adulterated in England is almost unreliable. The daily allowance of coffee per capita to each person in the United States is about half an ounce, and in California one and a half ounces.

THE BREAD OF LIFE.—The London *Dietetic Reformer* shows, by scientific data, that wheat meal, which is cheaper than bolted meal (fine flour), contains one-third more nutriment than flour does from which the bran has been sifted. The adoption, therefore, of wheat meal instead of fine flour, as bread-making material, would be an immense saving, amounting to hundreds of millions of dollars annually. But this is an insignificant matter when compared with the sanitary aspect of the question. Fine flour is not food at all, in the proper sense of the term. The elements of the grain which are separated in the process of bolting, are essential to perfect nutrition; hence, those who use fine flour are obliged to subsist mainly on other things, or lose their health; so that nearly all they expend for a fictitious "staff of life" is worse than thrown away. No one who makes baker's bread a principal article of diet can long maintain health, while all who use wheat-meal bread (unless it is fermented or adulterated in some way) can always maintain health with a very little addition of other foods, either fruits or vegetables. As we said, therefore, in our last issue, the laboring population will become independent whenever they learn to "eat to live."

A CHERRY PUDDING can be made by boiling one-half pint of rice half an hour in five times as much water, and then pouring it boiling hot into one pint of wheat-meal. Mix thoroughly, and place it in small spoonfuls in a nappy, interlaying it with one pint of cherries (or more, if not very juicy), and then steaming half or three-quarters of an hour. Serve warm in the nappy, trimming it with melted sugar, or sweetened cherry juice, or some other sweet sauce. This recipe can be used for other such small fruits in their season, as will bear cooking enough to do the wheat-meal. Half an hour is the least that will answer for that purpose; three-quarters of an hour is better.

WHITE WAX.—To convert yellow wax into white wax, the former is boiled in water, spread out into thin layers, and exposed to the light and air. This is repeated until all the color is gone, and the wax remains pure and white.

INK FROM FLOORS.—Ink spots on floors can be extracted by scouring with sand wet in oil of vitrol and water. When the ink is removed rinse with strong pearlash water.



W. B. EWER.....SENIOR EDITOR

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Saturday Morning, May 31, 1873.
San Francisco:

Legal Tender Rate.—S. F., Thurs., May 29.—
buying 85; selling 85½.

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THINK TWICE before you stop your paper, because just now your funds are low. If you stop a valuable paper you will not cut yourself (and may be others too) down in that which will be the most irreparable, that which will lessen you in the very highest qualities of your possessions; that which would give you greater power for accumulating for yourself and for usefulness to others? Had you not better dispense with some expenses that contribute merely to your lower wants; that will merely entail your pecuniary possessions; something that can be made up to you again by good fortune in any future day? Remember that a good newspaper helps you grow as well as your crops. You cannot make up lost time on live newspaper reading. Can you apply the sunshine of yesterday to the growth of to-day or to-morrow?

CORRECTION.—Our correspondent, "L. P. Mc.," wishes to state that the idea he intended to convey in his letter last week, in the first few lines, was that mining operations were not being carried on to any extent in Mariposa County, in the direction of Hitee Cove. Also that the "River Tunnel" will be 6,000 feet in length when completed, not 600 feet, as printed.

RICH PAY.—Quartz has been found in the Excelsior mine in Tuolumne County and is now being taken out.

The EUREKA mine cleared up from the amalgamators \$8,500 from six days run, with 10 stamps, a few days since.

PROSPECTING in the vicinity of Virginia City is more actively carried on at present than it has been for some years past.

The ANNUAL election of the Mechanics' Institute will take place on Monday, June 2d.

TUOLUMNETES are to have a reunion at Oakland on the 17th of June.

An Endless Wire Rope-Way for Little Cottonwood Canon.

Cheap and rapid transportation of material, particularly argentiferous ores from the Little Cottonwood mines to the railroad station at the mouth of the cañon, is a matter of grave importance to the mining interests of that region, especially during the long winter which is the rule in that locality. This well-known cañon is a deep gorge in the Wahsatch Range of mountains, 25 miles southeast of Salt Lake City, Utah, and is the only outlet to an extensive and exceedingly rich silver region, whose yield during the past season was about 400 tons of ore per day. All this ore had to be hauled over a narrow rugged mountain road at an expense of some \$7 per ton. The road referred to runs the whole length of the cañon, 8¼ miles, and is free from snow only about five months in the year. At the upper end of the cañon is Alta City, 3,200 feet above sea level and at the lower end is the town of Granite, 4,270 feet above sea level, or 3,926 feet below Alta, being an average grade of 476 feet to the mile. The snow lies at Alta for about seven months and has a depth of from 8 to 20 feet deep for a distance of five miles below Alta. It is a region of avalanches and snow slides which, as is well known, have several times occasioned serious damage and loss of life. The heavy grade in the cañon is unfavorable to the construction of a narrow-gauge railroad, and the depth of snow would necessitate snow sheds, etc., all attended with great expense. Several parties in this city having seen the advantages of the endless wire rope system in other localities, are now forming a company in this city for the purpose of putting up a wire rope road elevated on towers high enough above snow and other obstructions to carry its load free from all interruption at all seasons of the year.

Everyone who has been there knows that the locality is peculiarly favorable for a line of this kind, while at the same time no other system can compete with it in economy, and not at all during the winter months. There is little doubt, if it were erected, but that it would have all the carrying trade during the winter, and, if the company were reasonable in their charges, all of the summer trade also, then the mines could be worked during the winter and there would be no need of the great accumulation of ore in the dumps. The character of the seasons, depth of snows, points exposed to avalanches, etc., are all explained at length in the report of the engineer employed to look into the matter. During the winter months the charge for transportation down the cañon is from \$10 to \$20 per ton and up the grade is from \$20 to \$40 per ton and often for many weeks it is impossible to haul at all. In this cañon are the famous Emma, Flaggstaff and Vallejo mines with some 90 other mines more or less developed, the majority only partly so. The ore from these mines is argentiferous galena, yielding from \$16 to \$500 per ton in silver and from 12 to 60 per cent lead.

The high charge of transportation through the cañon precludes the possibility of shipping any very low grade ores. During the few summer months the ore is hauled in wagons, charging under favorable circumstances about \$5 per ton. Considerable money and time have been expended on the road to make it passable, but the experience of the past winter shows that its passage is still a difficult operation. It is frequently blocked by streams of loaded wagons. A fine stream of water runs throughout the year in the bed of the cañon at a point two miles below Alta, carrying about 1,000 inches of water in the driest season, and furnishing an abundant water power.

The engineers' report specifies the following as the ascent per mile from the town of Granite up the cañon, ¼ mile, 76 feet; first mile, 396 feet; second mile, 550 feet; third mile, 650 feet; fourth mile, 434 feet; fifth mile, 470 feet; sixth mile, 604 feet; seventh mile, 410 feet; eighth mile, 336 feet; total, 3,926 feet; average grade per mile, 476 feet, or 1 in 11. The advantages of the system set forth, are that the endless wire rope-way will run by gravitation, the loaded buckets descending, carrying back the empty ones with a grade of 1 on 8; hence, with the addition of a small amount of power on the line of route, furnished by the water privileges referred to, the line can be run with facility. The heaviest grade which a locomotive can propel itself is

300 feet to the mile. This is nearly reached at the Pittsburgh railway, Mount Diablo Coal Mines in this State, which, on a grade of 296 feet to the mile, carries coal down grade from the mine to the depot on the river. The American Fork, three feet gauge railroad, in Utah, has a grade of 296 feet to the mile for 1,700 feet, using a Fairlee engine. On this proposed line the angles are to be small, and the parts sustaining the bearing pulleys 150 feet apart. These, in order to carry the ore clear of the greatest depth of snow, will have to be 40 feet high for the upper four miles; below Tannersville their height can be materially reduced.

The small cost of constructing the endless wire rope-way system of transportation in comparison with any other; the facility with which it can be repaired in the event of a break from a heavy avalanche; the economy of its working; its ability to work under all conditions of weather and the rapidity and low cost at which it conveys its load, recommend it particularly for the purpose proposed at this particular locality. The undertaking if carried out will be of great benefit to the mining district of Little Cottonwood and will be the means of developing the mines more systematically and continuously than has been done before. The estimate of cost of construction of an endless wire rope-way of Hallidie's patent with a capacity of 500 tons per day and a length of 8¼ miles, places the total cost at \$150,755. This estimate provides extra arms to the posts throughout. So that in the event of the business requiring it, an additional line could be erected at very little cost. A very handsome profit could be made on the capital invested if they carry ore down at \$3 per ton and the company could afford to carry it for even less than that.

To construct this proposed ropeway it will take 3 grip pulleys, costing \$2,100; 8 plane pulleys, \$2,000; 580 sets of bearing and guide pulleys, \$1,500; 870 sets of carriers, steel clips, brackets, etc., \$26,100; two turbines, \$1,475; lumber, \$35,000; labor on construction \$20,000; 16½ miles of steel rope hardened and tempered, \$55,500. This in addition to freight of material to the cañon will amount to over \$150,000. It is probable if the company perfect the arrangements they expect to, work will be commenced on this road as soon as possible.

Atmospheric Pressure in Mines.

It is only until quite recently that any elaborate experiments have been made to find the laws of temperature and moisture at any considerable depths in the mines. Mr. Simonin, however, has recently published the results of a series of experiments for the purpose of ascertaining the increase of atmospheric pressure in deep mines, and especially such as go below the surface of the ocean. Mr. S. says as this increase has generally been found to be 1 millimetre for every metre as we descend, it remains to be seen whether the same would be the case in the shafts of mines where the air, confined in a narrow space, is at the same time exposed to the action of a powerful draught, and more or less impregnated with steam, and at variable temperatures. Operating in very deep shafts, our author had the opportunity of bringing the barometer below the level of the sea.

His experiments were conducted in the basin of the Saone and Loire, where the coal pits of the Crenoz and Epinae are situated. Two shafts are here 400 metres deep, and since the average reading of the barometric altitudes at the orifice is about 355 metres above the level of the sea, Mr. Simonin operated at a clear depth of 45 metres below that level. From his observations, it appears that at Epinae, as regards temperature, there is an increase of 10 Centigrade for every 50 metres of vertical descent; and, as regards pressure, a rise of 1 millimetre in the barometer for 11° of vertical descent. At the Crenoz there was an increase of 1° in the temperature for every 40° of vertical descent, and an increase of pressure of 1 millimetre for every 10 metres.

The averages, therefore, are: For temperature, 1° for 45 metres; and for pressure, 1 millimetre for 10½ metres. Mr. Simonin has taken care to operate only on shafts through which pure air enters; for the air that leaves the mine is vitiated, and unduly heated from various causes. The shaft should also be water-tight, and the wood work as much as possible free from decomposition by fermentation.

"A CARD" from O. W. Easton, in relation to the letter of our Mariposa correspondent last week, is unavoidably laid over. It will appear next week.

A \$40,000 strike is reported at the Mono mine in Dry Cañon, Utah.

BORAX from California is selling in New York at 24 cents, and that from Nevada for 20 cents.

A NUGGET weighing over eight ounces was taken out of a claim at Deer Valley, El Dorado County, last week, by E. N. Smith.

The World of Atoms.

It is quite impossible for the human mind to conceive of the minuteness of chemical atoms. M. A. Gusdin, an eminent French physician, has recently been investigating the molecular and atomic constitution of bodies, and has published the result of his researches. He holds that the distance from centre to centre of individual atoms does not exceed the 2,500-millionth part of an inch. To give some idea of this excessive minuteness, the Doctor states that there are as many atoms of oxygen and hydrogen in a single drop of water, as there would be grains of sand covering the entire surface of the earth to a depth of over one mile! These atoms are held to be spheroidal agglomerations of particles, each perfectly distinct from the other.

His theory of combination is, that an atom of one kind is always placed between two others of a different kind, and always exactly on the lines joining their centres. With these atomic files or lines he arrives at all the molecular arrangements indicated by chemical formulae, in which the atomic systems are invariably found perpendicular to the axis. The phenomena of crystallization is also referred to this parallel and symmetrical disposition of atoms. In square or hexagonal prisms, and in the rhomboid, the atoms preserve their invariable parallelism, perpendicular to the axis; while in the doubly oblique they observe two unequal distances; and it is this inequality that produces the phenomena of double refraction in crystals of unsymmetrical systems. These theories are novel and interesting, particularly in reference to their bearing on crystallization.

The extreme minuteness of the original particles of matter may help explain the wonderful transparency exhibited by most cometary bodies, many of which, though millions of miles in diameter, scarcely affect, to any appreciable extent, the brightness of the faintest star when they pass between it and the earth. That most comets do thus exist in this most extreme degree of divisibility, is known from the immense disproportion which exists between their actual mass or weight and their known diameters. A comet which, in its gaseous condition, has a diameter of many thousand miles, would, if brought to the density of earthly matter, be reduced to a diameter of only a few rods, or perhaps, even feet. The law of repulsion, by which all gases are governed, when applied to those gases existing in the condition of original atoms, would give us a form of matter so attenuated that it is only by some such illustration as is given above, in relation to a drop of water, that the human mind can conceive of it.

It is only through a knowledge of the possibility that a single drop of water may, by being separated into its ultimate atoms, be made to cover the entire earth, that we can form any idea of the probable fact that the heavenly bodies, although now separated by such immense distances, once absolutely filled all space, so that afar touched star throughout the immensity of the universe.

This ultimate or rather original extreme divisibility of matter will also explain the possibility of that highly attenuated, interplanetary ether, which is supposed to pervade all space, and all matter as well, and to actually separate each particular atom, as above described from every other, so that no one is in actual contact with its neighbor on either side. Such is the world of atoms as indicated by chemistry and philosophical research.

AN EXCELLENT PRACTICE.—An exchange complains of the "tendency in this country toward placing scientific men, rather than those of exclusive literary acquirements, at the head of our more prominent collegiate institutions." We deem it a matter of congratulation, rather than otherwise, that such a change in public sentiment, with regard to our educational institutions, is rapidly gaining ground. Practical education is the kind of learning that the country and the world is now most in need of.

THE SURVEY of the Colfax and Grass Valley narrow gauge railroad has been completed, and Engineer Watson's report as to the route is favorable.

COPPER ORE is selling at Salt Lake City as follows: Fifteen per cent. ore \$25 per ton; 25 per cent. ore \$45; thirty per cent. ore \$55; forty per cent. \$110 per ton.

The Vienna Exposition.

(FROM OUR SPECIAL CORRESPONDENT—GUIDO KUSEL.)

A week from now the Emperor Franz Joseph and the Empress will be received at the pavilion by the Protector, Archduke Carl Ludwig; the President, Archduke Rainer; and the Director, Baron Schwarz. The present princes and dukes will be greeted by the Emperor, and the high company will then proceed into the rotunda of the palace. At the same moment the national hymn will be sung by several "Sing-vereins," accompanied by Strauss' Orchestra. The Emperor and Empress take a place on a throne-estrade, where there is room for the prominent high guests and the archdukes. After the hymn the Emperor will deliver the opening speech, declaring that the Vienna Exposition of 1873 is opened. Archduke Carl Ludwig will answer as Protector, and Archduke Rainer as President of the Imperial Exposition Commission. A speech by the Mayor of Vienna will conclude the ceremony. The commissioners of the different countries go to their respective galleries to meet the Emperor in his rotunda.

To the present day, however, in the American department not a single box has been opened, except in the machinery hall, as our commissioners will probably keep away from their gallery. The Russians are just as far in their "putting up" as we are, occupying the extreme eastern end of the building. I send you

A Plan of the Different Buildings and pavilions as situated within the limits of the Exposition.

The numbers and letters on the accompanying cut signify: I. Palace of Industry; II. Machinery Hall; III. Art Hall; IV. Pavilion of Arts; V. Exposition of Art Amateurs; VI. Western Agricultural Hall; VII. Eastern Agricultural Hall; VIII. Pavilion of the Jury; IX. Emperor's Pavilion; X. Office of the Directory; XI. Post, Telegraph and Customs-House Offices; XII. Casino; XIII. Exposition of Horses; XIV. Railroad Station; W. Watch-Houses; A. Water Closets.

In the First Zone.

1. American Tavern; 2. Bier Halle of the Pilsen Brewery; 3. Bier Halls; 4. Hungarian Wine House; 5. American Bar-Room; 6. Pavilion of the "Nieu Presse"; 7. Swiss Confectionery; 8. Pavilion of Music-Boxes; 9. Bier Halle; 10. French Tavern; 11. Pavilion of the Duke Monaco; 12. Pavilion of the Domain Finepunk; 13. Swedish School House; 14. Swedish Army Exposition; 15. Swedish Hunting Pavilion; 16. Gothic Maneoleum; 17. Boiler Room; 18. Kiosk of the "Snedhehn"; 19. Kihhn's Dissectable House; 20. Pavilion of the "Erste Oesterr Sparbank"; 21. Sterk's Pavilion; 22. Pavilion of Little Children; 23. Restauration d Freres Provencean; 24. Salad Lettura; 25. Tavern; 26. Winehouse; 27. "Eisenhof" Exposition Hall for Metal Industry; 28. Pavilion for Austrian Medicinal Springs; 29. Pavilion of Tobacco and Cigar Specialties; 30. Pavilion of Perlmoseer Cement Wares from Nussdorf; 31. Russian Tavern; 32. Styrian Wine House; 33. Rnean Dwelling House; 34. Exhibition of the "Oesterreichischen Lolyd"; 35. Indian Tent; 36. Iron Hot-House; 37. Palace of the Viceroy of Egypt; 38. Japanese Buildings; 39. Circle Oriental; 40. Turkish Dwelling House; 41. Turkish Bazar; 42. Turkish Coffee House; 43. Persian Dwelling House; 44. Exhibition of the Imperial Royal Marine Ministry; 45. Light-House; 46. Photographic Association House; 47. Farm House of the Imperial Agricultural Society; 48. Sanitary Pavilion; 49. Building Yard; 50. Italian Tavern; 51. Exposition of the Horticultural Society; 52. Iron Furniture Pavilion; 53. Gardener's House.

Second Zone.

1. Light-House; 2. Ahmed Fountain; 3. Tri-

nump Port of a Brick Factory; 4. Russian Farm House; 5. Pump House; 6. Iron Church; 7. Swedish Farm; 8. Pavilion of Hungarian Forestry; 9. Pavilion of Styrian Forest Owners; 10. Saxonian Peasant House; 11. Szekler Peasant House; 12. Austrian School House; 13. Vorarlberg Farm; 14. Austrian Turner House; 15. Pavilion of Glase Paintings; 16. Slavakian Pleasant House; 17. Croatian Peasant House; 18. Rumanian Peasant House; 19. 20. Peasant Houses from near Prehurg.

Third Zone.

1. American Tavern; 2. Vienna Bakery; 3. English Working Mens House; 4. Pavilion for Seeds; 5. Water Tower for the High Pressure Water Conduit Pipes; 6. Iron House; 7. Swedish Tavern; 8, 9. Norwegian and Swedish Fisher Houses; 10. Norwegian Garden Kloeke; 11. Germany's Pavilion of Instruction; 12. Germany's Pavilion of Industry; 13. Germany's Exposition of Mining Industry; 14. Boarding House; 15. Pavilion Duke's Cohurg Gotha; 16. Duke's Sotmarzenberg Pavilion; 17. Pavilion Manthner; 18. Stahl Building; 19. Curtis' Ohelisk of Cement; 20. House of Artificial Stone; 21, 22, 23. Verderberg's, Innerberg's and Carinthia's Mining Industry; 24. Brewery; 25. Machine Shop Company's Building; 26. Tar and Aephntam; 27. Building Ornaments of Zinc; 28. Heffen's Machines Exposition; 29, 30. Rothschild's Bridge and Machine Exposition; 31. State Exhibition; 32. Wood Ware; 33. Pavilion of the "Staats Bahn"; 34. English Tavern; 35. Bridges and Road Building Association; 36. Tyrolian House;

France, is now produced in Germany up to 10 cwt. a day. It replaces the iodine-violet, the production of which, on account of the high price of iodine, is no more practicable. This change reduces the quantity of poisonous residue of the aniline factories, which, until now, consumed daily up to 30,000 cwt. of arsenical acid. This will be limited now only to the production of fuchsine; but even in this direction a favorable result is expected from the experiments made in all laboratories of the German factories to produce fuchsins without the use of arsenical acid. Two German chemists, Gracher and Lieberman, discovered (1868) that the dyeing matter of "madder" originates from carburated hydrogen, which appears also in the coal tar. Following up this discovery, they succeeded in making artificial alizarine from anthracene. Since 1870 this method, in producing alizarine from coal tar, is adopted by the most of the ten or twelve German aniline factories; only one factory is in England and one in France. The total produce of alizarins in 1873, amounts already to 22,000 cwt., of which, 15,000 are made in Germany.

Of the anthracene, the raw material for alizarins, there is for the present consume, an abundance of it in the five millions of cwt. of tar, produced in the gas works. The artificial alizarins dispense with all madder preparation, and the cultivation of madder is rapidly decreasing. At a lower price of alizarins, the import of log-wood will also considerably decrease.

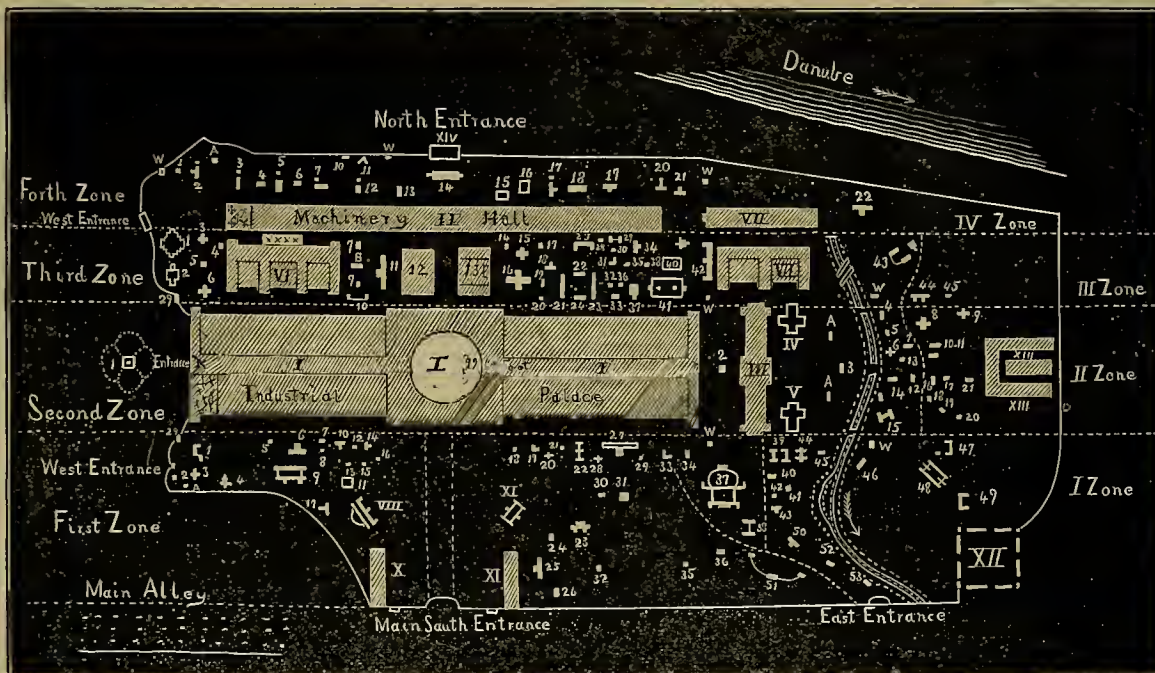
Since the above was in type our correspon-

popular hymn was sung by several "Vereins" accompanied by a selected band of music. The Emperor stepped up the estrade, on his arm the crown princess Victoria, of Germany, and the crown prince of Germany with the Empress, followed by the princes of Walles of Denmark, the arch-dukes, etc. It was a brilliant company in which, amongst the ladies, the Empress was the handsomest; but there is no need of writing much about this affair as the particulars of the whole ceremony were telegraphed the next day to the *New York Herald* at the expense of about \$7,500. For this purpose an American reporter, a French one, and Mrs. L. Mulbach from Berlin were engaged by the paper names.

In a clear, suphonic voice the Emperor declared the exposition of 1873 opened. After the ceremony the most of the visitors remained in the exposition rayon till six o'clock, p. m. The exposition is open, but several weeks of hard work is at hand yet, before all will be arranged. The English, Belgian, French, German and Austrian exposition is the most advanced, but it is premature to describe anything of this sort.

There was a strike here by the *factors* or hackney coachmen, lasting, however, only two or three days, but which created, nevertheless, the utmost consternation among those, who imagine that walking on foot is an impossibility. The end of the strike commenced on the 30th of April, so that everything went on smoothly on the 1st of May. This strike was humorous, considering the short time, but the other, that pounced on

our Commissioners here, was a very humiliating affair to all Americans. The Europeans, especially after several of the late public swindling in the United States were published, are very much inclined to point out the United States as the hot-bed of corruption, without taking any notice of their own. One can read almost every day a swindling story in the newspapers, in which Counts and Barons, as well as common people, are implicated. Nevertheless, this event with the United States Commissioners at the World's Fair, in which the whole world is represented, was a very bitter pill, and it is now with the new Commissioners Meers LeGrend and B. Canon, to avoid confusion, and to make "something" out of our



Ground Plan of the Exposition Rayon, at Vienna, with all Extra Buildings, Pavilions and Separate Expositions, 1873.

37. Additional Exposition for History of Inventors and Industry, and Pavilion for Ladies' Work; 38. Pavilion; 39. Danube Steamship Company's Pavilion; 40. Alien Peasant House; 41. Exposition of the Imperial Agricultural Ministry; 42. Wine Hall of all Countries; 43. Tavern; 44. Pavilion for Forest Industry; 45. Pavilion of arch Duke Albrecht.

Fourth Zone.

1. Bakery; 2. Boiler Room; 3. American Boiler House; 4. English Workmens House; 5. English Boiler House; 6. English Workmans House; 7. French Boiler House; 8. English Gas Factory; 9. Gas Company, Limited; 10. Belgian Workmens House; 11. Machine Shop; 12. Swiss Boiler House; 13. Belgian Boiler House; 14. Pavilion of the World's Trade; 15. German Boiler House; 16. Germany's Pavilion for Brick and Ice Machine; 17. Austrian Boiler House; 18. "Nord Bahn" Pavilion; 19. Nord-west Bahn Pavilion; 20. Boiler House for Water Conduit; 21. Pavilion Ring Hofer.

The German Aniline Exhibition.

In 1867 the German production of aniline oil was equal to 10,000 cwt. per year, but to the present time it increased to 25,000 cwt. The consumption of this article in the German color factories, however, is larger, so that 10,000 cwt. more is imported from outside. About a hundred pounds of fuchsine is produced daily, besides other dyeing matter. Also methyl-aniline, heretofore fabricated only in

deut writes as follows under date of May 2d: "The opening of the Exposition was effected yesterday, in the way I described in my last letter. The weather was not favorable for the occasion. It rained at intervals through the day, and damaged many elegant dresses of ladies who were caught on foot. The palace itself was opened at nine o'clock, but a great many visitors started out before six, in the morning, visiting the different buildings in the rayon. The programme was to close the palace at 11 A. M., but at this time one end of the carriages was at the portal of the Exposition, the other in town; There were many invited guests; free cards were also given to exhibitors and reporters of the press, of which there were over a thousand. The regular tickets for the 1st of May were sold at \$12.50 a piece, season tickets at \$50, and for ladies \$25. These season tickets are good also for the 1st of May. After the fourth, each single ticket costs 50 cents, and on Sunday 25 cents. The Prater alley was crowded with splendid carriages; a large force of police was busy to preserve order and to regulate the movements of carriages, etc. In the rotunda of the palace at half past twelve nearly all the places were taken up. The diplomatic corps were present all in gala array and a great variety of brilliant military uniforms were seen, amongst them the Hungarian magnates in their rich national costume. At 12 o'clock the Emperor and his guests entered the rotunda, while the

exposition, and to save the Union from being ridiculed. It is very lucky that Mr. McElrath was left in his place.

A Vienna correspondent of the *Daily News* exaggerates in an article about the expensive living in Vienna, stating that a "moderate" dinner costs from five to six shillings, and thinks that from the 1st of May a dish of soup will cost fifty cents. A moderate dinner, including wine or beer, costs two shillings, or fifty cents, in a decent, but second-class restaurant. Even on the 1st of May, in the exposition rayon, a moderate dinner amounted only to seventy-five cents.

CORUNDUM—EMERY.—An exchange reports the discovery of "a mine of corundum, an substance harder than emery," in Chester county Pennsylvania. It is said to be the only continuous deposit of the kind in the world, corundum generally being found in nodules. "Corundum harder than emery" is good, considering that emery is nothing else than corundum itself. Whatever is found in commercial emery that is not corundum, is an adulteration either added or not removed. A mine of pure corundum, of a character suitable for the manufacture of emery would be valuable.

THE SUTRO TUNNEL.—A meeting of the stockholders of the Suto Tunnel Co. is called for the 23d of June, to act upon a proposition already submitted, to increase the capital stock to twenty million dollars.

Cinnabar in Solano County.

A range of hills traverses the centre of the peninsula in Solano county, lying between the bays of Napa and Suisun. The Sulphur Spring Mountain, in which extensive deposits of cinnabar have long been known to exist, forms the southern limit of this range. The *Vallejo Chronicle* furnishes a complete history and an elaborate description of the mines. It says

The First Explorations for Cinnabar

And other minerals in the Sulphur Spring mountain were made by John Neate in 1852. In 1858 Mr. Neate placed before the late W. E. Barron, specimens of the cinnabar and coal taken therefrom. Barron discouraged the opening of any new quicksilver mine, stating as a reason, that the supply was greater than the demand. In 1862 Neate having become discouraged in the hope of obtaining the help of capitalists, determined to start himself in the attempt to develop a mine, and engaged some miners to help him, when the Sussol grant was rejected, the uncertainty of titles now prevented him from making any developments. In 1863 the titles being quieted, Neate obtained rights and privileges from the land owners and got fairly under way. The first actual mining done for quicksilver was upon the Brownlie ranch; here Neate mined with the help of six or eight miners for eighteen months and during that time extracted a quantity of rich ore, some of it going as high as eighty-five percent. About \$30,000 has been taken from the surface of this mine. It has not been explored to a greater depth than forty feet, and that in only one place. The mine is in the hands of the executors of the late W. E. Barron. After leaving this mine in 1870, he commenced prospecting

The St. John Quicksilver Mine,

Which is now attracting much attention. This mine and works are located on the Wilson Hill Ranch, which is situated five miles directly north of Vallejo, in the range of high hills that form a portion of the coast range. It is reached by three routes from Vallejo—all good wagon roads. The best and most pleasant, however, is via the Brownlie and Surveyor Rowe ranches; the next is via the Vallejo White Sulphur Springs; the third is via the Hunter Ranch. Though the first is by far the most agreeable and shortest route, it is only by the courtesy of Messrs. Rowe and Brownlie that it can be traveled, being their private property. A beautiful drive of a mile or so through the hills, passing on the right near the road the quicksilver mine and splendid furnace on the Brownlie Ranch, brings the visitor to the grounds of the St. John's Company, and within a few yards of the ledge or lode that gives such great promise of immense value, and has made the mine an object of many visits of quicksilver experts and geological celebrities. Character of the Ledge and Progress of the Explorations.

The ledge runs southeast and northwest, near the summit of one of the highest hills in the range, and dips to the north at an angle of about forty degrees; it was opened by a drift twenty feet below the out-crops, developing a width of thirty feet for the ledge with fifteen per cent. Ore all the way through; at the end of the tunnel or drift or at the "wall" on the east side the workmen have gone down with an incline for a distance of fifty feet; and it is in this latter mentioned excavation where the largest deposit of rich ore has been found. Our reporter descended the incline and saw a sight of wealth and riches pleasing to look upon. From the mouth of the incline, every foot down, the rock grew richer and richer, and the bottom of the incline was one solid mass of 50 to 60 per cent. ore; and out of the last twelve feet, the Superintendent informed us that he had taken five thousand dollars, and from, of the whole excavation, between seven and eight thousand had been taken out. It has been estimated by experts that there is something like forty or fifty thousand dollars in sight there. It is considered by nearly all who have visited the mine that the entire ledge contains as large, if not the largest and richest deposit of cinnabar possessed by any mine in the State at the present time. The Superintendent, acting on this belief, and to thoroughly test the matter, is running in a tunnel to tap the ledge on a level one hundred and seventy feet below the outcrop. This tunnel is already in one hundred and fifty feet, and it is expected that the workmen will strike the ledge in two or three weeks. Should they find the metal there, as in every probability they will, the richness of the mine will be fabulous, and its value as salable property immense. Another drift was pushed in on the ledge further east and at a higher level than the drift just described, to tap the metal already in sight, at a distance of twenty five feet below the bottom of the incline. The workmen here have struck the ledge, and a large body of water was drained off, and they are fast approaching the ore.

At a distance of two or three hundred feet west of the location of the above described operations, near the summit, a little prospecting has been done, developing a vein six feet wide, containing a leader of very rich metal six inches in width, with a foot and a half of paying ore on each side, which, when first discovered, was only the thickness of one's hand, growing wider as the workmen went down upon

it. Out of excavation, which is not of sufficient dimensions to screen a yoke of oxen, over \$800 has been taken out. The lode of this portion of the mine has been traced and explored for a half mile, and at intervals of twenty or twenty-five feet, shows the outcrop of metal of exceedingly rich character.

When Mr. Neate first commenced prospecting on this ranch, he ran a two hundred foot tunnel in a hill adjoining, and north of the last mentioned eminence, in which he found quite a large body of a low grade of ore. At three or four other places he has opened on considerable bodies of low grade rock, which will pay to work, especially at this point, where a mine can be operated so economically.

A mining expert thus speaks of the St. John's ledge: The Sulphur Spring mountain has an altitude of twelve hundred feet from the bay, and can be drilled to a depth of eight hundred feet with an easy tunnel. The development is in a ferruginous clay slate and sand stone. The clay slate lode is twelve feet wide having well defined walls of blue talcose slate. This lode, for fifty feet, has produced paying ore. The lode is in sandstone thirty feet wide with two well defined walls. The metal crosses the lode, being about one foot upon the foot wall and runs to four and five feet upon the hanging wall. This has been explored to a depth of forty feet, the ore and its matrix having that soft, rich, sugary appearance that cinnabar delights to live in. Other explorations upon the lode is showing a splendid out-crop, and is considered by all quicksilver miners who have examined or worked in it, as unparalleled in richness, and bids fair to out-rival the famous Almaden mines.

The Brownlie Mine.

The Brownlie mine is two miles southeast of the St. John's. The ore occurs in clay slate (metamorphic) which changes to Jasper, having a well-defined wall of talcose slate of cream color.

Quicksilver Smelting Works.

The superintendent of the St. John's mine is rebuilding the furnace, making it of much greater capacity and adding two more condensing chambers. The furnace torn down was too small for general use; it was built as an experiment in carrying out an idea of Mr. Neate's. It being a success, Mr. N. has applied for a patent, and is having the new one built on the same principle; it is now about completed. They have a furnace partially constructed, which can be completed very quickly whenever the occasion requires its use. We will endeavor to give the reader an idea of the manner of securing the quicksilver from the ore with the Neate furnace. The furnace proper is constructed of brick in a circular form between nine and ten feet in diameter and about thirteen feet high; the largest diameter of this furnace inside is four feet and six inches; it has a depth of twelve feet; the chamber is charged by filling it with ore and coke—a layer of each, one above the other; and its capacity is eight tons of ore every twenty-four hours; the fire is started in the chamber or furnace with an exceedingly heavy draught, the quicksilver raises in a vapor and passes with the smoke through a large flue about twenty feet long into the first condensing chamber, which is of brick, about twelve feet square. By the time the vapor finds the egress to the second condensing chamber, the principal portion of the vapor has cooled off, precipitating the liquid silver, which is run off into proper receptacles through small iron spigots from the bottom of the chamber. There are five condensing chambers altogether, situated about ten feet apart, connected by a long brick flue, each chamber gathering some quicksilver, but in the fifth chamber little if any is found, about all the vapor having condensed before reaching that point; the smoke then passes off into a chimney, thence into the atmosphere.

Thirty men are now employed by the Company, but accommodations are being made for one hundred.

The Company was incorporated on the 27th of April and the following officers were elected: President, E. J. Wilson; General Superintendent, John Neate; Secretary and Treasurer, L. C. Fowler; Trustees, E. J. Wilson, John Neate, L. C. Fowler, S. G. Hilborn, and J. W. Batcheller.

THE ONE-LEDGE THEORY.—Recent developments in the Pioche mines tend to prove as correct the one-ledge theory—that is, that in any mountain characterized by numerous argentiferous veins, those veins all tend, like small veins running to the main arteries in the human system, to one grand central deposit. The ledges on the south side of Spring mountain generally dip to the north, those on the north side to the south, and the bodies of ore have increased in extent as depth has been attained. If development continues in the future as they have in the past, we will yet be able to boast as great an extent of ore as have been exposed in the Comstock mines.—*Record*.

ENGLISH COAL.—The evidence so far taken by the select committee appointed by the English House of Commons to investigate the cause of the extraordinary advance in the price of coal tends to establish the fact that the increase in the price of the article is much larger in proportion than the increase in wages. There are serious complaints respecting the effects of high wages in diminishing the labor of workmen. It is stated that the men can now earn as much money in two or three days as they formerly did in six, and as they have more money they waste more time in idleness and drinking.

The Dry Concentration Process.

We have already referred to a dry concentration process employed by a company in Star Cañon, Humboldt county. It is called the "Krom process," and is said to work admirably. It concentrates the rebellious ores of Humboldt county to a tenth part of their bulk and at small expense and small loss of their assay value. The Salt Lake *Tribune* has been furnished with the following items in relation to the operations of the process in Star Cañon:

Work was commenced in March, 1873, on ores from the De Soto mine, in that district. The ore consisted from three to five per cent. of base metal, principally antimony, also some lead and zinc; the silver mostly occurs as a black sulphuret. The assay value in silver was about \$54 to the ton.

The following results of the treatment of the ore by three different methods are of interest to the mining and scientific world:

First—By amalgamation (stamp mill) process, the loss was to such an extent as not to leave any margin at all for the expenses of working.

Second—By the most approved method of wet concentration, 75 per cent. of all the silver was lost, and the 25 per cent. saved for final treatment, was not sufficient to pay expenses.

Third—By Krom's dry crushing and dry concentrating process over 95 per cent. of silver was saved, and the result produced was over \$1,000 in silver to the ton of concentrated ore from the original which contained in bulk only \$54 of silver to the ton.

If correct, these statements are important. Works on this plan are about to be started in Utah, and the *Tribune* says:

We shall look forward to the erection of these works with a great deal of interest, for, if the Krom process proves to be what is claimed for it. Mr. Nichols will prove a benefactor to every poor miner in Utah, by enabling him to utilize every pound of ore now so poor in silver as to be absolutely worthless; and when it is considered that we have millions of tons of such low grade ores which, if utilized and made to yield a good profit, as claimed by Mr. Nichols, the great importance of his process of concentration will be at once apparent. The problem of working low grade ores in the West economically has not yet been satisfactorily solved, we therefore hope the Krom process of concentration will prove the boon we need in Utah.

A New Concentrating Process.

Some reference has already been made in these columns to the new concentrating works on Star creek, in Humboldt county. In these works a new process for the concentration of ores has been introduced, and, from all accounts, is operating with success. It is well adapted to the rebellious ores of Humboldt county, and the Silver State promises for it wonderful results. The ores are concentrated by a dry process, we believe. The works were erected by an Eastern company at a large expense, and similar works, we understand, are in contemplation elsewhere. It reduces thirty tons of ore daily, at a light expense, to less than one-twentieth its original bulk, saving the valuable metals to within five or ten per cent. of the assayed value. This is what is claimed by the Silver State, and if the statement be true, the process must prove of great value. That journal says: "It is at present reducing inferior ore from the De Soto mine, hitherto valueless, with profit, the concentrating ore assaying from \$4,200 to \$2,000, according to the percentage of base metal it contains. This can be easily handled and shipped to San Francisco or elsewhere at a comparatively small expense."

These results, which we have received from a reliable source, indicate what can be accomplished in mining here with this concentrator. It is just the thing needed, and if it continues to work as represented it will stimulate the mining interest of the Humboldt range to activity. The ores of the range referred to are of a peculiar character. They abound in base metals and are exceedingly difficult to work. They cannot be profitably reduced by the ordinary wet processes of crushing and amalgamation, nor do they, as a rule, contain sufficient base metal to make the smelting of them profitable. This Star Creek process, therefore seems to be just what is required, and might be introduced with advantage in other portions of the State.—*Va. Enterprise*.

BIG BLAST.—A blast of 250 kegs of powder was, 15th inst., put into the Excelsior Gravel Claim, at Placerville, El Dorado County. According to the *Republican* more than \$4,000,000 in gold has been taken from this claim since 1850, from about 60 acres of land. They took out nearly \$100,000 last winter from the second washing—or the tailings—on which they have been at work for the past eight months. The effect of the blast will aid materially in future hydraulic operations.

Iron ore has been found in Marion County, Oregon.

THE BROOKLYN.—The Brooklyn mine is one of the latest developments of the district, and, as it is attracting considerable attention at the present time, we yesterday paid it a visit, to report on it from personal observation. It is situated about a mile east of Main street, and a short distance from the Bowery hoisting works. The main shaft was begun by a party of practical miners the first of last November. When the shaft was down 78 feet, they drifted 32 feet to the north, but without finding the ledge; they then drifted southward 25 feet and cut a vein of good ore 18 inches wide. The vein was then followed 25 or 30 feet to the west, widening considerably in this drift, from which some very rich ore was extricated. A winze was then started down on the ledge from the bottom of the shaft, which had been sunk 13 feet when we visited it yesterday. The ore body at the bottom of the winze is four feet wide, strong, and both walls are as smooth and well defined as any walls we ever examined, the dip from where the vein was first struck to the bottom being at an inclination of about 36 degrees, and very regular. The ores are all of the chloride class, not a tracing of lead having been found in a number of assays. Five assays were taken of ore at different places in the winze from top to bottom, not one of which showed less than \$100 of silver to the ton. The strike of the ledge is easterly and westerly, the dip to the south, and the formation is quartzite. The vein is still improving as depth is attained. On these facts the reader can form his opinion as to the Brooklyn. It certainly promises to become one of our most important mines. The fortunate locators and owners are A. W. McDonald, C. Wagoner, J. A. Forbes, L. A. Bull and Levi Levitt—all industrious and intelligent practical miners. They are pushing developments with all energy.—*Pioche Record*.

COAL DISCOVERY.—The *Virginia Enterprise* says the natural supply of wood fuel in that region is rapidly becoming exhausted, and the enormous prices which the citizens of Virginia are annually compelled to pay for firewood, renders any indication of a coal discovery hereabouts an important event. For several years past it has been known that coal exists in the vicinity of Verdi on the line of the Central Pacific Railroad. Several attempts have, at various times, been made to develop the mineral in paying quantities, but until quite recently nothing has been found to warrant the existence of a permanent coal bed. During the past two months Mr. Lewis Wentworth, of this city, in company with some other gentlemen, has been prospecting the Verdi mine.

Wentworth has just returned with an ample supply of samples of coal and the accompanying rocks. At the depth of twenty feet from the surface, the shaft which the party has been sinking, passes through an eight-foot layer of gray sandstone and bituminous shale, under which lies an apparently well defined seam of shaly coal of unknown thickness. The seam lies in a horizontal position, and has been penetrated to the depth of three feet without reaching its nether side. The coal, when free from shale and sandstone, is, for croppings, unusually good, and burns readily when ignited. The accompanying rocks in the vicinity of the mine are those usually accompanying a coal measure, such as tertiary sandstone, gray sandstone, shale and conglomerates. The Wentworth party are vigorously at work on the claim, and we earnestly hope their labors may be crowned with success.

AN EXTENSIVE SYSTEM OF RESERVOIRS.—Messrs. Parke & Bowie, says the *Enterprise*, have filled Seven-mile Cañon from their large tailings mill up as far as the Winfield Mill with a complicated system of reservoirs for catching tailings and slimes. Of some of these the tailings themselves form the walls, their outer edges being built up as the tailings accumulate, while others are constructed of lumber or are excavations in the hill sides. They stand one above another, terrace fashion, and while one is being filled another is drying out, in order that its contents may be removed. The contents of all these reservoirs are almost incalculable, and as long as the mills above continue to reduce ore the accumulation goes on. The tailings which find their way down Six-mile Cañon are also caught and saved. Even after they have once worked the tailings, Parke & Bowie catch them in reservoirs below their mill, and so work them again and again until they have worn them out and they float off with the water to Carson River, refusing to be again caught or further tortured. In looking at all these traps for saving the nimble silver, and in reflecting upon the former wasteful modes of working, one cannot but sigh when he thinks of the millions in gold, silver and quicksilver now forever lost in the sandy bed of Carson River, and the broad marshes of its sink.

NEW FURNACES.—The *Arizona Citizen* says that two new furnaces are nearly completed at Sierra mines, and the work of smelting silver and lead ores will soon commence. Samuel Hughes & Co. sent some experienced smelters this week to examine the mines, with a view to putting up works as soon as possible. About thirty men are at work there now, and if the ores pay as assays and tests indicate, this will soon become one of the most populous, prosperous camps in the Territory. Mr. Hughes has had from the commencement great confidence in this district, and has kept men steadily at work there for a year and a half. We hope and believe he will receive a rich reward for his enterprise.

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Mining and Other Companies.

Owing to the time necessary to mail the present large edition of the M. & S. Press, we are obliged to go to press on Thursday evening—which is the very latest hour we can receive advertisements.

Angels Quartz Mining Company—Principal place of business, 408 California street, San Francisco. Location of works, Angels Mining District, Calaveras County, California.

Notice.—There are delinquent upon the following described stock, on account of assessment (No. 3), levied March 4th, 1873, the several amounts set opposite the names of the respective shareholders as follows:

T D Mathewson.....	3	300	\$150 00
T D Mathewson.....	4	400	200 00
T D Mathewson.....	5	500	250 00
T D Mathewson.....	17	25	30 00
T D Mathewson (not issued)	325 5-7	483 57	
J H Fish.....	342 6-7	574 29	
J H Fish, Trustee.....	20	50	75 00
J H Fish, Trustee.....	21	10	75 00
J H Fish, Trustee.....	22	50	75 00
J H Fish, Trustee.....	23	50	75 00
M R E Fish.....	9	1000	1500 00
R M Anthony.....	19	100	150 00
R M Anthony.....	45 5-7	68 57	
R M Anthony.....	19	60	90 00
E H Sawyer.....	11	800	1200 00
E H Sawyer.....	(not issued)	228 4-7	342 86
Oeo. Osgood.....	12	600	900 00
Oeo. Osgood.....	(not issued)	114 4-7	171 43

And in accordance with law and an order made by the Board of Directors, on the 4th day of March, 1873, so many shares of each parcel of said stock as may be necessary, will be sold at public auction, at the office of Maurice Dore & Co., 327 Montgomery street, San Francisco, Cal., on Monday, April 21st, 1873, at 2 o'clock p. m., of such day, to pay said delinquent assessment, together with costs of advertising and expenses of sale.

Office, Room No. 1, 408 California street, San Francisco, California (up stairs). a5-3t

POSTPONEMENT.—Angels Quartz Mining Company. The above sale is hereby postponed to Wednesday, June 12th, 1873, at the same hour and place.

Office, Room No. 1, 408 California street, San Francisco, California. GEORGE CONGODON, Secretary. m17

Alpine Gold Mill and Mining Company—Location of works, Puckerville Mining District, Amador County, California. Principal place of business, San Francisco, California.

Notice is hereby given that at a meeting of the Board of Directors of said Company, held on the 13th day of May, 1873, an assessment (No. 4) of one dollar per share was levied upon the capital stock of the Corporation, payable immediately, in United States gold coin, to the Secretary, at the office of the Company, No. 438 California street, San Francisco, Cal. Any stock upon which this assessment shall remain unpaid on the 15th day of June, 1873, will be delinquent, and advertised for sale at public auction, and unless payment is made before, will be sold on the 9th day of July, 1873, to pay the delinquent assessment, together with costs of advertising and expenses of sale.

Office, No. 438 California street, San Francisco, California. JOEL F. LIGHTNER, Secretary. m15

The Central Land Company—Office and principal place of business, 338 Montgomery street, Room 5, San Francisco, California.

Notice.—There are delinquent upon the following described stock, on account of assessment levied on the 9th day of April, 1873, the several amounts set opposite the names of the respective shareholders, as follows:

Jacob Hardy.....	No. Certificate.	No. Shares.	Amount.
Edward McLean.....	30	100	\$50 00
Edward McLean.....	11	50	balance 50 00
Edward McLean.....	12	50	balance 50 00
F B Haswell.....	34	100	50 00
F B Haswell.....	35	100	50 00

And in accordance with law and an order of the Board of Directors, made on the 9th day of April, 1873, so many shares of each parcel of said stock as may be necessary, will be sold at public auction, at the above named room 5, 338 Montgomery street, San Francisco, Cal., on Saturday, May 31, 1873, at 1 o'clock p. m., of such day, to pay said delinquent assessment, together with costs of advertising and expenses of sale.

Office, Room 5, No. 338 Montgomery street, San Francisco, Cal. F. B. HASWELL, Secretary. m17

California Beet Sugar Company—Principal place of business, San Francisco. Location of works, Alvarado, Alameda County, California.

Notice is hereby given, that at a meeting of the Board of Directors, held on the 25th day of May, 1873, an assessment of Ten (\$10) Dollars per share was levied upon the capital stock of the Corporation, payable immediately, in United States gold coin, to the Secretary, at the office of the Company, 314 California street, San Francisco, Cal. Any stock upon which this assessment shall remain unpaid on the 30th day of June, 1873, will be delinquent, and advertised for sale at public auction, and unless payment is made before, will be sold on Tuesday, the 22d day of July, 1873, to pay the delinquent assessment, together with costs of advertising and expenses of sale.

Office, 314 California street, San Francisco, Cal. LOUIS FRANGONI, Secretary. m29

Dutch Flat Blue Gravel Mining Company, Place of business, San Francisco.

Notice is hereby given, that at a meeting of the Directors, held on the 13th day of May, 1873, an assessment (No. 1) of ten cents per share was levied upon the capital stock of the Corporation, payable immediately in U. S. Gold coin, to the Secretary, at the office of the Company, Room 11, 401 California street, San Francisco, Cal. Any stock upon which this assessment shall remain unpaid on the 15th day of June, 1873, will be delinquent, and advertised for sale at public auction, and unless payment is made before, will be sold on Monday, the 14th day of July, 1873, to pay the delinquent assessment, together with costs of advertising and expenses of sale.

Office, Room 11, 401 California street, San Francisco, Cal. W. M. HELLMAN, Secretary. m16

Equitable Tunnel and Mining Company, Location of works, Little Cottonwood District, Utah Territory.

Notice is hereby given, that at a meeting of the Board of Directors, held on the 25th day of May, 1873, an assessment (No. 2) of ten cents per share was levied upon the capital stock of the Corporation, payable immediately in United States gold and silver coin, to the Secretary, at the office of the Company, No. 35 New Merchants' Exchange, San Francisco, Cal. Any stock upon which this assessment shall remain unpaid on the 30th day of June, 1873, will be delinquent, and advertised for sale at public auction, and unless payment is made before, will be sold on the thirtieth day of June, 1873, to pay the delinquent assessment, together with costs of advertising and expenses of sale.

Office, No. 35 New Merchants' Exchange, San Francisco, Cal. CHARLES S. HEALY, Secretary. m6

Frear Stone Company of California—Principal place of business and location of works, City and County of San Francisco, State of California.

Notice is hereby given, that at a meeting of the Board of Directors, held on the 27th day of May, 1873, an assessment (No. 1) of two dollars per share was levied upon the capital stock of the Corporation, payable immediately, in United States gold coin, to the Secretary, at the office of the Company, No. 414 California street, San Francisco, California. Any stock upon which this assessment shall remain unpaid on the 30th day of June, 1873, will be delinquent, and advertised for sale at public auction, and unless payment is made before, will be sold on Monday, the 21st day of July, 1873, to pay the delinquent assessment, together with costs of advertising and expenses of sale.

Office, 414 California street, San Francisco, Cal. W. L. WICKER, Secretary. m29

Hasloe Mill and Mining Company—Location of works, Gentry's Gulch, Mariposa County, Cal.

Notice is hereby given, that at a meeting of the Board of Directors, held on the 14th day of May, 1873, an assessment (No. 1) of fifty (50) cents per share was levied upon the capital stock of the Corporation, payable immediately, in U. S. gold and silver coin, to the Secretary, at the office of the Company, Room 14, No. 408 California street, San Francisco, Cal. Any stock upon which this assessment shall remain unpaid on the 25th day of June, 1873, will be delinquent, and advertised for sale at public auction, and unless payment is made before, will be sold on the 21st day of July, 1873, to pay the delinquent assessment, together with costs of advertising and expenses of sale.

Office, Room 11, No. 408 California street, San Francisco, Cal. J. W. TRIPLE, Secretary. m17

Hardy Coal Mining Company—Location of principal place of business, San Francisco, Cal.

Notice.—There are delinquent upon the following described stock, on account of assessment levied on the 26th day of March, 1873, the several amounts set opposite the names of the respective shareholders as follows:

Names.	No. Certificate.	No. Shares.	Amount.
Warren Goodale.....	37 (old)	94	\$569 30
Edward McLean.....	1	30	30 00
Edward McLean.....	2	52	22 00
Edward McLean.....	6	41	41 00
Edward McLean.....	16	100	100 00
Edward McLean.....	22	50	50 00
Edward McLean.....	23	50	50 00
Edward McLean.....	24	150	150 00
Edward McLean.....	33	2	2 00
Edward McLean.....	35	4	4 00
Edward McLean.....	47	40	40 00
C S Kilbridge.....	35 (old)	4	50 00
F O Lowrey.....	15	12 1/2	12 00
Jacob Hardy.....	10	100	100 00
Jacob Hardy.....	12	10	10 00
Jacob Hardy.....	21	85	85 00
Jacob Hardy.....	31	8 1/2	8 50
Jacob Hardy.....	38	12	12 00
Jacob Hardy.....	41	8	8 00
Jacob Hardy.....	45 (old)	1	12 50
Jacob Hardy.....	28 (old)	1	12 50
Jacob Hardy.....	39 (old)	1	12 50
M H Eastman.....	28	45	45 00
M H Eastman.....	29	55	55 00
M H Eastman.....	30	50	50 00
Bartlett & Wilcox.....	33 (old)	50	312 50

And in accordance with law, and an order of the Board of Directors, made on the 26th day of March, 1873, so many shares of each parcel of said stock as may be necessary, will be sold at public auction at the Company's office, Room 5, No. 338 Montgomery street, San Francisco, Cal., on the 24th day of May, 1873, at 1 o'clock p. m., of such day, to pay said delinquent assessment, together with costs of advertising and expenses of sale.

Office, Room 5, No. 338 Montgomery street, San Francisco, Cal. JACOB HARDY, Secretary pro tem. m3

Ida and Rhoda Lewis Consolidated Mining Company—ANNUAL MEETING.

The annual meeting of stockholders of the Ida and Rhoda Lewis Consolidated Mining Company, for the election of Directors, and for the transaction of such business as may be presented, will be held on Tuesday, June 17th, 1873, at 1 o'clock p. m., at the office of the Company, No. 10 Webb street, San Francisco, California. J. DE STA MARINA, President. m13-td

Kincaid Flat Mining Company—Principal place of business, San Francisco, Cal. Location of works, Tuolumne County, State of California.

Notice is hereby given, that at a meeting of the Board of Directors, held on the 8th day of May, 1873, an assessment of two dollars per share was levied upon the capital stock of the Corporation, payable immediately in United States gold and silver coin, to the Secretary, at the office of the Company, No. 331 Kearny street, San Francisco, Cal. Any stock upon which this assessment shall remain unpaid on the 9th day of June, 1873, will be delinquent, and advertised for sale at public auction, and unless payment is made before, will be sold on Tuesday, the 24th day of July, 1873, to pay the delinquent assessment, together with costs of advertising and expenses of sale.

Office, 217 Sansome street (up stairs) San Francisco, Cal. R. H. CORNELL, Secretary. m15

Mansfield Gold Mining Company—Principal place of business, San Francisco, California. Location of works, Kelsey Mining District, El Dorado County, California.

Notice is hereby given, that at a meeting of the Board of Directors, held on the 8th day of May, 1873, an assessment of five cents per share was levied upon the capital stock of the Corporation, payable immediately, in United States gold and silver coin, to the Secretary, at the office of the Company, No. 331 Kearny street, San Francisco, Cal. Any stock upon which this assessment shall remain unpaid on the 9th day of June, 1873, will be delinquent, and advertised for sale at public auction, and unless payment is made before, will be sold on Tuesday, the 24th day of July, 1873, to pay the delinquent assessment, together with costs of advertising and expenses of sale.

Office, No. 331 Kearny street, San Francisco, Cal. WM. SMALL, Secretary. m15

Mazepa Silver Mining Company—Location of works, Ely Mining District, Lincoln County, State of Nevada. Principal place of business, San Francisco, Cal.

Notice is hereby given, that at a meeting of the Directors, held on the 20th day of May, 1873, an assessment (No. 1) of five cents per share was levied upon the capital stock of the Corporation, payable immediately in United States gold coin, to the Secretary, at the office of the Company, No. 320 Sansome street, San Francisco, California. Any stock upon which this assessment shall remain unpaid on the 24th day of June, 1873, will be delinquent, and advertised for sale at public auction, and unless payment is made before, will be sold on Monday, the 15th day of July, 1873, to pay the delinquent assessment, together with costs of advertising and expenses of sale.

Office, No. 320 Sansome street, San Francisco, Cal. LOUIS FRANGONI, Secretary. m28

Office Newton Booth Consolidated Mining Company—NOTICE TO STOCKHOLDERS.

Some irregularities having occurred in the levying, advertising and collecting the assessment levied on the 10th day of February, 1873, said assessment being of 25 cents per share on the capital stock of the Newton Booth Consolidated Mining Company, notice is hereby given, that a meeting of the Trustees of said Company, held on the 7th day of May, 1873, said assessment levied on the 10th day of February, 1873, has been rescinded, and another assessment of five cents per share has been levied in lieu thereof. Any one having paid the assessment levied February 10th, 1873, shall be credited for the amount paid on account of the assessment levied this day.

San Francisco, May 7th, 1873. LOUIS FRANGONI, Secretary.

Newton Booth Consolidated Mining Company—Location of principal place of business, San Francisco, California. Location of works, Ely District, Lincoln County, Nevada.

Notice is hereby given, that at a meeting of the Directors, held on the 7th day of May, 1873, an assessment of five cents per share was levied upon the capital stock of the Corporation, payable immediately in United States gold coin, to the Secretary, at his office, No. 314 California street, San Francisco, Cal. Any stock upon which this assessment shall remain unpaid on the 14th day of June, 1873, will be delinquent, and advertised for sale at public auction, and unless payment is made before, will be sold on Monday, the 11th day of July, 1873, to pay the delinquent assessment, together with costs of advertising and expenses of sale.

Office, No. 314 California street, San Francisco, California. LOUIS FRANGONI, Secretary. m10

Office of the Providence G. and S. Mining Company—Location of works, Nevada County, California. Principal place of business, San Francisco, California.

The annual meeting of stockholders of the Providence

Gold and Silver Mining Company, for the election of Directors and transaction of business, as may be presented, will be held on Friday, the 20th day of June, 1873, at 3 1/2 o'clock p. m., at the office of the Company, room 37, New Merchants' Exchange, California street, San Francisco, California. J. M. BUFFINGTON, Secretary. m21-td

Regent Consolidated Mining Company. Principal place of business, S. n Francisco, California. Location of works, Little Cottonwood District, Salt Lake County, Utah Territory.

Notice is hereby given that at a meeting of the Board of Directors, held on the 26th day of May, 1873, an assessment of ten cents per share was levied upon the capital stock of the Corporation, payable in lawful currency of the United States, to the Secretary, No. 438 California street, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the 28th day of June, 1873, will be delinquent, and advertised for sale at public auction, and unless payment is made before, will be sold on Monday, the 22d day of July, 1873, to pay the delinquent assessment, together with costs of advertising and expenses of sale.

Office, 435 California street, San Francisco, California. W. M. L. USTICK, Secretary. m27

Rising Star Mining Company—Location of principal place of business, San Francisco, California.

Notice.—There are delinquent upon the following described stock, on account of assessment levied on the 25th day of April, 1873, the several amounts set opposite the names of the respective shareholders as follows:

Names.	No. Certificate.	No. Shares.	Amount.
E B Barnes.....	372	100	\$ 5 00
E B Barnes.....	358	25	1 00
J M Buffington, Trustee.....	50	100	6 00
J M Buffington, Trustee.....	59	100	6 00
J M Buffington, Trustee.....	61	100	6 00
J M Buffington, Trustee.....	64	100	6 00
J M Buffington, Trustee.....	65	100	6 00
J M Buffington, Trustee.....	66	100	6 00
J M Buffington, Trustee.....	67	100	6 00
J M Buffington, Trustee.....	68	100	6 00
J M Buffington, Trustee.....	69	69	4 14
J M Buffington, Trustee.....	373	100	0 00
J M Buffington, Trustee.....	375	100	0 00
J M Buffington, Trustee.....	382	100	6 00
J M Buffington, Trustee.....	383	100	6 00
J M Buffington, Trustee.....	401	375	22 50
J M Buffington, Trustee.....	413	391	19 86
J M Buffington, Trustee.....	419	25	1 50
J M Buffington, Trustee.....	420	25	1 50
J M Buffington, Trustee.....	421	25	1 50
O Brown.....	116	25	1 50
O Brown.....	117	25	1 50
O Brown.....	118	25	1 50
O Brown.....	119	25	1 50
O Brown.....	120	25	1 50
O Brown.....	121	25	1 50
O Brown.....	122	25	1 50
O Brown.....	123	25	1 50
O Brown.....	124	25	1 50
O Brown.....	125	25	1 50
O Brown.....	126	25	1 50
O Brown.....	127	25	1 50
O Brown.....	128	25	1 50
O Brown.....	129	21	1 26
O Brown.....	395	50	3 00
O Brown.....	396	50	3 00
O Brown.....	397	22	1 32
W Bryan.....	123	12	7 72
H B Berrymen.....	186	100	6 00
H B Berrymen.....	187	100	6 00
H B Berrymen.....	188	31	1 98
H B Berrymen.....	355	60	3 00
H B Berrymen.....	356	50	3 00
M Bannon.....	394	60	3 00
Jacob Bryan.....	416	25	1 50
Frank Clayton, Trustee.....	423	331	19 86
Frank Clayton, Trustee.....	427	632	39 72
W J Ounn.....	338	70	4 50
N B Green.....	33	200	12 00
N B Green.....	34	100	6 00
N B Green.....	35	31	1 86
N B Green.....	36	50	3 00
R W Ounn, Trustee.....	364	50	3 00
R W Ounn, Trustee.....	365	50	3 00
R W Ounn, Trustee.....	366	50	3 00
R W Ounn, Trustee.....	367	50	3 00
T O Hutchinson.....	417	25	1 50
S T Kennedy.....	157	100	6 00
S T Kennedy.....	158	100	6 00
S T Kennedy.....	343	85 1/2	5 20
P Newman.....	194	60	3 00
P Newman.....	195	50	3 00
P Newman.....	196	50	3 00
S Nathan.....	426	331	19 86
A Rosenfeld.....	32	24	1 44
A Rosenfeld.....	298	1000	60 00
A Rosenfeld.....	299	100	6 00
A Rosenfeld.....	300	100	5 00
M Rosenheim.....	177	331	19 86
Daniel Sheehen.....	414	50	3 00
C A Wabman.....	415	25	1 50

And in accordance with law, and on order of the Board of Directors, made on the 25th day of April, 1873, so many shares of each parcel of said stock as may be necessary, will be sold at public auction, at the office of the Company, room 37 New Merchants' Exchange, California street, San Francisco, Cal., on Monday, the 10th day of June, 1873, at the hour of 12 o'clock p. m., of said day, to pay said delinquent assessment, together with costs of advertising and expenses of sale.

Office, 37 New Merchants' Exchange, California street, San Francisco, California. J. M. BUFFINGTON, Secretary. m29

Schell Creek Mining Company—Location of principal place of business, No. 304 California street, San Francisco, California. Location of works, Schell Creek Mining District, White Pine County, State of Nevada.

Notice is hereby given, that at a meeting of the Board of Directors, held on the 10th day of April, 1873, an assessment of ten cents per share was levied upon the capital stock of the Corporation, payable immediately, in United States gold coin, to the Secretary, at the office of the Company, No. 304 California street, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the 15th day of May, 1873, will be delinquent, and advertised for sale at public auction, and unless payment is made before, will be sold on Monday, the 24th day of June, 1873, to pay the delinquent assessment, together with costs of advertising and expenses of sale.

Office, No. 304 California street, San Francisco, Cal. P. W. VAN WINKLE, Secretary. m19

POSTPONEMENT.—The day for deeming shares delinquent on the above assessment is hereby postponed until Saturday, the 24th day of May, 1873, and the sale thereof until Monday, the 16th day of June, 1873. By order of the Board of Directors.

Office, No. 304 California street, San Francisco, Cal. P. W. VAN WINKLE, Secretary. m19

POSTPONEMENT.—The day for deeming shares delinquent on the above assessment is hereby postponed until Saturday, the 7th day of June, 1873, and the sale thereof until Monday, the 24th day of June, 1873. By order of the Board of Directors.

Office, No. 304 California street, San Francisco, Cal. P. W. VAN WINKLE, Secretary. m19

The Sanderson Gold Mining Company—Location of works, Railroad Flat, Calaveras County, California.

Notice is hereby given, that at a meeting of the Board of Directors, held on the 14th day of May, 1873, an assessment (No. 4) of 12 1/2 cents per share was levied upon the capital stock of the Corporation, payable immediately, in United States gold and silver coin, to the Secretary, at the office of the Company, No. 304 California street, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the 22d day of June, 1873, will be delinquent, and advertised for sale at public auction, and unless payment is made before, will be sold on Thursday, the 18th day of June, 1873, to pay the delinquent assessment, together with costs of advertising and expenses of sale.

Office, 113 Leland street, San Francisco. WILLIAM STUART, Secretary. m16

State of Maine Mill and Mining Company. Principal place of business, San Francisco, Cal. Location of works, Amador County, Cal.

Notice is hereby given, that at a meeting of the Board of Directors, held on the 23d day of May, 1873, an assessment (No. 3) of five cents per share was levied upon the capital stock of the Corporation, payable immediately, in United States gold and silver coin, to the Secretary, at the office of the Company, 305 Montgomery street, San Francisco, Cal. Any stock upon which this assessment shall remain unpaid on the 21st day of July, 1873, will be delinquent, and advertised for sale at public auction, and unless payment is made before, will be sold on Monday, the 21st day of July, 1873, to pay the delinquent assessment, together with costs of advertising and expenses of sale.

Office, 305 Montgomery street, San Francisco, Cal. m29

Sierra Iron Company—Location of Works, Sierra and Plumas Counties. Principal place of business, San Francisco, California.

Notice.—There are delinquent upon the following described stocks, on account of assessment levied on the 1st day of April, 1873, the several amounts set opposite

Machine Builders.

ESTABLISHED 1851.

PACIFIC IRON WORKS,

First and Fremont streets,

SAN FRANCISCO

RA P. RANKIN, A. P. BRAYTON,
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Steam Engines and Boilers,

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Mining Machinery of Every Description,

And all other classes of work generally done at first-class establishments, manufactured by us at the lowest prices, and of the best quality.

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Foundry and Iron Works.

HINCKLEY & CO.,

MANUFACTURERS OF

TEAM ENGINES,

Quartz, Flour and Saw Mills,

Wey's Improved Steam Pump, Brodie's Improved Crusher, Mining Pumps, Amalgamators, and all kinds of Machinery.

N. E. corner of Tehama and Fremont streets, above How-
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THE RISDON

Iron and Locomotive Works.

INCORPORATED.....APRIL 30, 1863.
CAPITAL.....\$1,000,000.

LOCATION OF WORKS:
Corner of Beale and Howard Streets,
SAN FRANCISCO.

Manufacturers of Steam Engines, Quartz and Flour Mill Machinery, Steam Boilers (Marine, Locomotive and Stationary), Marine Engines (High and Low Pressure). All kinds of light and heavy Castings at lowest prices. Cams and Tappets, with chilled faces, guaranteed 40 per cent. more durable than ordinary iron.

Directors:
Joseph Moors, C. J. Brenham, O. E. McLane,
Wm. Norris, Wm. H. Taylor, Lloyd Tevis,
James D. Walker.

WM. H. TAYLOR.....President
JOSEPH MOORE.....Vice-President and Superintendent
LEWIS R. MEAD.....Secretary
25v17-47

UNION IRON WORKS,

Sacramento.

ROOT, NEILSON & CO.,

MANUFACTURERS OF

STEAM ENGINES, BOILERS,

CROSS' PATENT BOILER FEEDER AND SEDIMENT COLLECTOR

Dunbar's Patent Self-Adjusting Steam Piston

PACKING, for new and old Cylinders.

And all kinds of Mining Machinery.

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RAILROAD AND OTHER IRON
—AND—
Every Variety of Shafting,

Embracing ALL SIZES of
Steamboat Shafts, Cranks, Piston and Connecting Rods, Car and Locomotive Axles and Frames

HAMMERED IRON

Of every description and size.

Orders addressed to PACIFIC ROLLING MILL COMPANY, P. O. box 2093, San Francisco, Cal., will receive prompt attention.

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CO-OPERATIVE,

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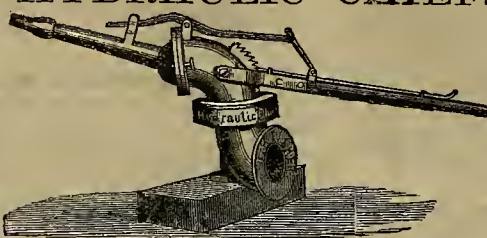
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KNUCKLE
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Cheapest and Best
Hydraulic Machine
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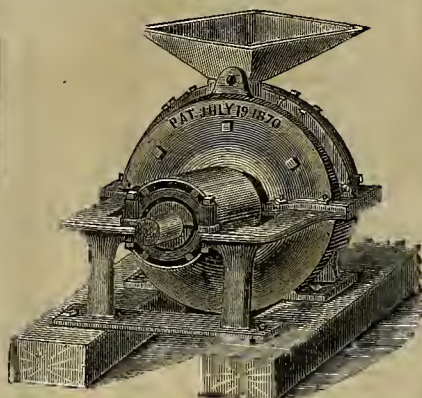


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9v23-14

Address F. H. FISHER, Nevada, Cal.

HYDRAULIC MINERS, TAKE NOTICE—I hereby caution Miners and Manufacturers against making, buying, selling or using a Hydraulic Machine or Joint known as the Little Giant, manufactured and sold by E. R. & J. Craig and Richard Hoskin, as the same is an infringement upon the invention of the machine known as FISHER'S HYDRAULIC CHIEF, secured by Letters Patent, No. 110,222, dated Dec. 20, 1870. All parties participating in such infringements will be rigorously prosecuted. Nevada, Jan. 13th.

THE LIGHTNING MILL.



THE LIGHTNING MILL For Pulverizing Quartz,

"Charleston Rock," and all Native Phosphates, Flint, Feldspar, Iron Ore, Manganese, Antimony, Carbon, Corundum, Old Crucibles, Barytes, Brimstone, Slate, Soapstone, Graphite, Glass, Marble, Plaster, Anthracite and Bituminous Coals, etc.

WM. STEWART'S

Patent Bone Mills and Crushers.

For Grinding Bones, Rock, Quartz, and all hard substances; also, Corn, Wheat, Oats, Barley, Coffee, Spices, etc.

WALKER BROS. & CO., Twenty-third and Wood Streets, Philadelphia, Sole Manufacturers of Stewart's Celebrated Patent Bone Mills and Crushers, A. W. Straub & Co.'s Patent Revolution French Burr Mill and A. Duval's Patent Centrifugal Pumps.

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MINING STEAM PUMPS.

DAVID STODDART,

114 Beale Street, - - - - - SAN FRANCISCO.

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PRESCOTT, SCHEIDELL & CO.,

MARYSVILLE FOUNDRY.

Corner of B and Fourth streets, Marysville, Cal.

MANUFACTURERS OF

STEAM ENGINES,

STATIONARY AND PORTABLE

SAW AND GRIST MILLS,

Hydraulic Machinery,

Quartz Crushing and Amalgamating Machinery

Of every description, constantly on hand.

Plans and estimates furnished upon application. Repairs upon all kinds of Machinery promptly made, and at moderate charges.
Having unrivalled facilities, we are prepared to make to order, at short notice, anything required in our line. Specimens of our work may be seen in all the mining regions on this coast.

NATIONAL LOCOMOTIVE WORKS.

DAWSON & BAILY,

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Manufacture LOCOMOTIVES adapted to
Every Kind of Railway Service.

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All work accurately fitted to gauges, and thoroughly interchangeable.

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Photographs of Locomotives can be seen at the
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Manufactured
TO ORDER,
to throw from
One
to an
eight-inch
STREAM.

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CROCKER'S PATENT TRIP HAMMER QUARTZ BATTERY.



The inventor having perfected and tested the durability and capacity of these Batteries to his entire satisfaction, is now ready to manufacture and guarantee them. Parties in want of a Battery cannot find their equal in regard to PRICE, WEIGHT, CAPACITY, POWER to RUN THEM. State and County Rights for Sale by

G. D. CROCKER,
17v26-tf 315 California street, San Francisco.

Notice is hereby given, that the copartnership heretofore existing between A. J. Severance, Charles W. Randall and J. Gus. Burt, under the firm name of "Severance, Holt & Co.," is this day dissolved by mutual consent. A. J. Severance, having purchased all the interest of his late partners, will continue the business of manufacturing and selling Diamond Drills as before, under the style of A. J. Severance & Co. Dated San Francisco, Nov. 24, 1871.

Office, 315 California street. A. J. SEVERANCE,
OHAS. H. RANDALL,
J. GUS. BURT.

22-v23-tf

THEODORE KALLENBERG,

MACHINIST,
and Maker of Models for Inventors. All kinds of Dies
Stamps and Punches made. Also, all kinds of
Small Gears Cut.

Repairing done on very Reasonable Terms and in the
best manner. No. 32 Fremont street, S. F. 19v23-3m

BURLEIGH ROCK DRILLS

—AND—

Air Compressors.

The Burleigh Rock Drills, which have stood the test of five years' constant use at the Hoosac Tunnel, and which are now in use in nearly every State in the Union, as well as in Europe and South America, are unequalled in efficiency and economy by any other Drilling Machine. They are of various sizes, and equally well adapted to Tunneling, Shaffing, Open Cut or Quarrying, and will drill six to ten inches per minute in granite. They are driven by steam above ground. The Burleigh Air Compressor is the best engine yet devised for furnishing the "air motor" for the many purposes to which it is now being used.

They are to be used on the St. Gothard Tunnel, Switzerland; Tunnel 13 miles long. We refer to the following gentlemen and works:

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For further information, etc., address

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AGENT FOR THE PACIFIC COAST. 115

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PHELPS BROTHERS, Proprietors

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J. M. STOCKMAN,

Manufacturer of

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(Over W. T. Garratt's Brass Foundry).

N. W. corner Natoma and Fremont streets, S. F. En-
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Particular attention paid to all kinds of FIRE WORK
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GRATES, RANGES, etc.

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Established 1856.

We have just added a large amount of new machinery of
the latest and most improved kind, and are again prepared
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Tanned Manila Rope; Hay Rope; Whale Line, etc., etc.

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Stove and French Range Work, grate and fender work,
small machines of all descriptions, house
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IRON CASTINGS of all descriptions at short notice.
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NOTICE.—Particular attention paid to making Super-
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ALL KINDS of Brass, Composition, Zinc, and Babbitt Metal
Castings, Brass Ship Work of all kinds, Spikes, Sheathing
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Gongs of superior tone. All kinds of Cocks and Valves, Hy-
draulic Pipes and Nozzles, and Hose Couplings and Con-
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PRICES MODERATE.
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One of these Lamps, when placed at a distance of 200 feet from the bank, will light up a bank surface 260 feet in length and 160 feet high, and to a much better advantage than any other light heretofore tried, and at an expense not to exceed five cents per hour. Lamps furnished at short notice.

Letter of Recommendation.
Mr. C. B. Brown—Sir: Your Patent Lamp for lighting hydraulic mines, which you sold to me in December last, has given entire satisfaction, and far exceeds my expectations, and I think it the best and cheapest light ever used to light mining claims by night, and am satisfied that I have saved three hundred dollars by the use of it in the last mining season over pitch or any other light of the same brilliancy; and I will also say that if I could not get another lamp, five hundred dollars would not buy it.
Yours,
W. D. APLIN.

Little York, Nov. 5, 1872.
For further particulars, address,
fe22-1f C. B. BROWN, Placerville, Cal.

P. J. PHILLIPS & CO., No. 608 Clay street, near Montgomery, San Francisco, are agents for Brown's Lamp, where it may be seen.

The California Powder Works

No. 314 CALIFORNIA STREET.
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Manufacturers and have constantly on hand
SPORTING,
MINING,
And BLASTING
POWDER,

OF SUPERIOR QUALITY, FRESH FROM THE MILLS. It being constantly received and transported into the interior, is delivered to the consumer within a few days of the time of its manufacture, and is in every way superior to any other Powder in Market.
We have been awarded successively

Three Gold Medals
By the MECHANICS' INSTITUTE and the STATE AGRICULTURAL SOCIETY for the superiority of our products over all others.
We also call attention to our
HERCULES POWDER.

Which combines all the force of other strong explosive now in use, and the lifting force of the BEST BLASTING POWDER, thus making it vastly superior to any other compound now in use.

A circular containing a full description of this Powder can be obtained on application to our Office.
16v20-3m JOHN F. LOHSE, Secretary.

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No family that uses canned Fruits, Vegetables, Sardines or Oysters, should be without one of these convenient household tools. No Restaurant, Hotel or Oyster Saloon can afford to do without one. It will cut out any shaped hole, from a triangle to a perfect circle. One sample sent postage free for 75 cents.

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17 New Montgomery st. (under Grand Hotel), S. F.

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MAP OF UTAH.

SIZE, 40 BY 55 INCHES; SCALE, 8 MILES TO AN INCH.

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Manufactured by the San Francisco Gas Company.

FOR SALE BY ALL GROCERS.
15v26-2m

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Plane, Specifications, and Estimates for Machinery of all Kinds.
We also design machines to meet particular demands and secure and assign the patents on the same.
No. 237 First street, San Francisco. apl3-1m

NEW ENTERPRISE.

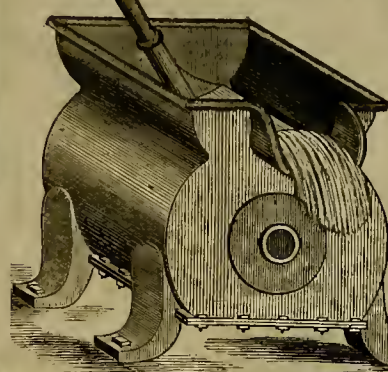
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We offer this wonderful Pump on this coast, confident that it surpasses any other in use when the amount of water discharged, the power required and the cost are compared; also the simplicity and durability of its working parts add to its great merit. It rarely getting out of order, and when it does, requiring no skill to repair it. It has no equal as a Windmill Pump.
Farmers, stock raisers, miners, ship owners, captains of vessels, dry-dock owners, irrigating companies, railroad men, or any one interested in Pumps, come and see its wonderful operations. This Pump has been approved (as a Fire and Bilge Pump) and adopted by the Supervising Board of Inspectors of Steam Vessels, and by the Secretary of the Treasury, as appears by Circular No. 4, issued from the Treasury Department February 21, 1872. This Pump can be seen at practical exhibition and for sale at our warehouse, No. 727 Market street, San Francisco. This Pump was exhibited and tested, with wonderful results, at the last State Fair in Sacramento.



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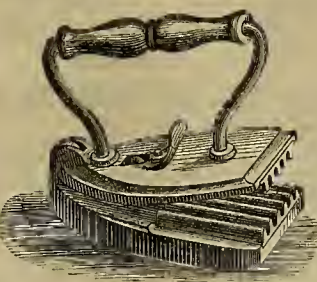
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Sole Agent for Washoe Tool Mfg Co.'s Goods west of Rocky Mountains.

No. 1 Round Eye surface, 4 lbs.....	\$14	No. 17 Drifting.....	4 1/2 lbs.....	\$17
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No. 3 " " " 5 lbs.....	15	No. 19 " " " 5 1/2 lbs.....	20	
No. 4 " " " 5 1/2 lbs.....	18	No. 20 " " " 6 lbs.....	20	
No. 5 " " " 6 lbs.....	20	No. 21 Poll " " " 4 lbs.....	20	
No. 6 " " " 6 1/2 lbs.....	22	No. 22 " " " 4 1/2 lbs.....	20	
No. 7 " " " 7 lbs.....	24	No. 23 " " " 5 lbs.....	20	
No. 8 Flat Eye surface, 4 lbs.....	18	No. 24 " " " 5 1/2 lbs.....	22	
No. 9 " " " 4 1/2 lbs.....	18	No. 25 " " " 5 lbs.....	24	
No. 10 " " " 5 lbs.....	18	No. 26 " " " 5 1/2 lbs.....	30	
No. 11 " " " 5 1/2 lbs.....	20	No. 27 " " " 7 lbs.....	30	
No. 12 " " " 6 lbs.....	22	No. 28 Coal " " " 2 lbs.....	14	
No. 13 " " " 6 1/2 lbs.....	24	No. 29 " " " 2 1/2 lbs.....	14	
No. 14 " " " 7 lbs.....	24	No. 30 " " " 3 lbs.....	15	
No. 15 Drifting.....	3 1/2 lbs.....	No. 31 " " " 3 1/2 lbs.....	16	
No. 16 " " " 4 lbs.....	16			

Washoe Mattocks and other Washoe goods cheap. Also, Pick Eyes ready for the steel, for Blacksmiths, which will be sold cheap. Prices from \$12 to \$16. 14v26-2am3m

Polishing and Fluting Iron.



This new invention takes the place of two articles needed in nearly every house. As a POLISHING IRON it has no superior. The part used for Fluting is made of brass, and highly polished. A Receipt for making FRENCH GLOSSING STRAIGHT, that gives a superior polish, goes with each iron. The Polishing Iron and Fluter, being in one, are both heated at the same time. We are now prepared to furnish them in quantities to suit.
Price, \$3.

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The San Francisco Nickel Plating Company are prepared to plate articles of all descriptions, of any metal. Cutlery, Liquor Flasks, Pistols, Guns, Swords, Bridle Bits, Pole Crabs, Hub Bands, Dash Rails, and all articles of household hardware plated at short notice, and warranted. Nickel Plate never tarnishes or corrodes, always retaining its polish until the article is worn out. Office at the KIMBALL MANUFACTORY WORKS, Cor. Fourth and Bryant Streets. 12v26-3m



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Of any desired Shade or Color,

Mixed ready for application, and sold by the gallon

It is Cheaper, Handsomer, more Durable and Elastic than the best of any other Paint.

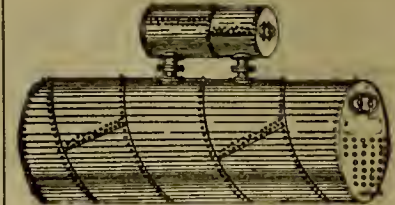
Office, corner Fourth and Townsend streets, San Francisco. Send for sample card and price list.
15v23-3mewp HEALY & JEWELL, Agents.

San Francisco Boiler Works,

123 and 125 Beale Street.....SAN FRANCISCO.

F. I. CURRY.

(Late Foreman of the Vulcan Iron Works,) Proprietor.



High and Low Pressure Boilers of all Descriptions.

SOLE MANUFACTURERS OF THE CELEBRATED SPIRAL BOILER.

SHEET IRON WORK of every description done at the Shortest Notice.

All kinds of JOBBING and REPAIRING promptly attended to. 17v25-3m

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High & Low Pressure Boilers

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Built according to Drawings or Specifications, and SHEET IRON WORK executed at the shortest notice, and on the most reasonable terms.

Repairing promptly attended to, and at reasonable rates.

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Steam Boiler Manufactory

—OF—

JAMES H. SHANLEY,

(Successor to D. McDonald.)

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ALL SORTS OF STEAM BOILERS

Made to order and repaired.

Also all kinds of Sheet Iron Work done promptly, and at prices to suit the times. 25v25-3m

McAFEE, SPIERS & CO.,

BOILER MAKERS

AND GENERAL MACHINISTS,

Howard st., between Fremont and Beale, San Francisco

SHEET IRON PIPE.

THE

Risdon Iron and Locomotive Works

Corner Howard and Beale Streets,

Are prepared to make SHEET IRON AND ASPHALTUM PIPE, of any size and for any pressure, and contract to lay the same where wanted, guaranteeing a perfect working pipe with the least amount of material.

Standard sizes of railroad Car Wheels, with special patterns for Mining Cars. These small wheels are made of the best Car Wheel Iron, properly chilled, and can be fitted up with the improved axle and box—introduced by this company, and guaranteed to outlast any other wheels made in this State.

All kinds of Machinery made and repaired. 24v22-8m JOSEPH MOORE, Superintendent.

BLACK DIAMOND FILE WORKS.



G. & H. BARNETT,

Manufacturers of Files of every Description,

Nos. 39, 41 and 43 Richmond street, Philadelphia, Pa.

MILL SAW FILES A SPECIALTY. 18v25-1y

OAKEY & SON'S EMERY AND BLACK LEAD MILLS, Blackfriars Road, London, England.
OAKEY'S WELLINGTON KNIFE POLISH. Packets, 3d. each; tins, 6d., 1s., 2s., 6d., and 4s. each.
OAKEY'S INDIA RUBBER KNIFE BOARDS from 1s. 6d. each.
OAKEY'S SILVERSMITHS' SOAP (NON MERCURIAL), for Cleansing and Polishing Silver, Electro-plate, Plate-glass, Marble, etc. Tablets, 6d. each.
OAKEY'S GENUINE EMERY, GRAIN AND FLOUR.
OAKEY'S EMERY AND GLASS CLOTH.
OAKEY'S CABINET GLASS PAPER, BLACK LEAD, etc.
OAKEY'S GOODS SOLD EVERYWHERE by Ironmongers, Grocers, Oilmen, Brushmakers, Drugists, etc. 21v26-1y

MINING SUMMARY.

California.

ALPINE COUNTY.

Alpine Miner, May 24: Tarshish mill is still running, and has made no definite clean-up yet. Mr. Hunter says he has about 60 tons more to run through before arriving at any thorough understanding of the experiment.

AMADOR COUNTY.

KENNEDY—Amador Ledger, May 24: It has been several weeks since we have mentioned this mine, but as it has run along so smoothly and satisfactorily under the superintendency of Mr. P. Reichelt, we could only speak well. We now find that the new shaft has reached a depth of 386 ft., and that it has been decided by the Co. to run a level from this point west until they strike the main lead, which will be done within 20 or 30 ft. From the old shaft the Co. are taking out some splendid rock, and the mill grinds out its regular monthly allowance of precious gold. The rock taken from the present level is improving in richness, and has every indication of lasting for years to come.

ALPINE—We are informed by a gentleman from Plymouth that the workmen in this mine have already struck some exceedingly rich ore, and that the Co. feel highly elated.

CALAVERAS COUNTY.

GWIN—Calaveras Chronicle, May 24: The contract for sinking the south shaft 100 ft. below the 600-ft. level is nearly completed. Only about 18 ft. remain to be sunk. We learn that another contract has been let to the same parties now engaged in the shaft to sink it 100 ft. below where the completion of their first contract will leave it, making 800 ft. in all. The ledge shows remarkably well in the bottom of the shaft, and the mine is paying largely. Immense quantities of ore are being taken from the various stopes, and the batteries are all kept in constant motion.

OKLAN UP—Simpson & Co., proprietors of the great hydraulic in Tunnel Ridge, partially cleaned up this week. How much gold was obtained we don't know, but we hear the amount stated all the way from \$5,000 to \$20,000.

AUSTRIAN—We understand that some of the richest ore ever discovered has lately been found in this mine near Jesus Maria. Our informant states that a single sack of quartz taken from the bottom of the shaft was estimated to contain \$3,000 in gold.

WORTH'S HILL—Prindle & Martin are making huge strides in their hydraulic claim. They have probably better facilities for working their claim to good advantage than most miners. They have already made a "face" of 200 ft. wide, 80 ft. high and 160 ft. deep. The company have two "runs" of sluices, the main run being 1,000 ft. in length. The dump will accommodate any amount of tailings, and the claim is good for twenty years to come.

PETER DAVIS has hung up his hydraulic for a season, and is now operating upon a quartz ledge above Lattimer's store. The vein shows up middling well, is about 7 ft. wide, and carries well defined walls.

ALEX. BROWN is putting the Epizootic shaft down as fast as picks and muscles will permit. He expects to find pay dirt at the depth of 60 ft., and rich at that. Jack Barker has 200 ft. of bed-rock tunnel to run before he can drain the hill. The claim, at the last working, hung to the tune of \$3 and \$4 per day. The ledge pitching into the hill, and the great amount of water encountered necessitated the running of a tunnel before the ground can be worked.

SQUIRES & Co., near Worth's Hill, still continue bringing the yellow stuff to light. The tunnel is in about 80 ft. They have a steady and even paying claim.

EVERETT—Calaveras Citizen, May 23: The machinery necessary for working this claim is being rapidly put in position. In the management of this mine, the Co. have felt their way carefully, and now feeling certain that it is a good investment, have determined to erect nothing but permanent improvements. With this view, they are erecting machinery capable of sinking 160 ft.

RODASINO—This claim has been paying about as usual for several months past, and the rock still continues to increase in richness. From a deficiency of water, however, the mill will be stopped in 2 or 3 weeks.

ODONABURO SOUTH EX.—Last Saturday there was struck a highly encouraging prospect. They are running a tunnel to cross the ledge, which they expect to strike in less than 300 ft. from the mouth of the tunnel. The tunnel is now in something more than 100 ft. After drifting a short distance they found some beautiful specimens of quartz, studded with bright sheets of plate-gold, quite similar to some of those from the Cedarberg, which have become so familiar. The strike has caused considerable excitement in Greenwood and vicinity.

EL DORADO COUNTY.

ST. LAWRENCE—Placerville Democrat, May 24: Ten new stamps have been added to the battery of the St. Lawrence Mill, and on Saturday last the whole were set in motion, so that now the product of that first class ledge is being crushed to powder by 30 stamps at the rate of over 40 tons in each 24 hours. The shaft is now down to a depth of 500 ft. with a thickness and ore of a better quality than any heretofore opened. Drifting is to be immediately commenced in both directions at the 500 ft. level, while at the same time work will be continued in the upper levels and the work of sinking the shaft will be vigorously prosecuted.

AT GEORGETOWN, last Sunday we were shown a beautiful specimen of gold which had been taken out during the previous week, by Mr. Sliney, at his claim on Wilton Hill, about 8 miles above Georgetown. This specimen was 4 1/4 inches long, nearly an inch wide, perhaps over 1/4 of an inch thick, remarkably regular in form and shape, bright, washed gold, pure, of great fineness, and weighed a trifle over 3 ounces.

The Mining & Scientific Press,

Started in 1860, is one of the oldest weekly journals now published in San Francisco. It has been conducted by its present proprietors for nine years, during which period it has been repeatedly enlarged and constantly improved. The active and steadfast efforts of its publishers have gained for its conduct an amount of practical experience greater than any other publishers have accumulated on this coast, of a weekly journal.

The aim paid by us for the best editorial talent obtainable for our special class journal; for engravings, for interesting news and correspondence, and for printing a large-size, handsome sheet, is unequalled by that of any other American weekly west of the Mississippi.

As a PRACTICAL MINING JOURNAL it has no rival on this Continent.

It is the only MINING, and the only SCIENTIFIC journal of the Pacific States.

Every Miner, Assayer, Millman, and Metallurgist in the United States should take it.

Every Pacific Coast Mechanic, Engineer, Inventor, Manufacturer, Professional Man, and Progressive and Industrial Student should patronize its columns of fresh and valuable information.

Every Mining Engineer, Superintendent, Metallurgist, Mine Owner and Mine Worker in the world should profit by its illustrations and descriptions of New Machinery, Processes, Discoveries and Record of Mining Events.

Every intelligent thinker in the land, in high or humble situation, who would avoid literary trash for genuine information, should SUBSCRIBE AT ONCE.

DEWEY & CO.

Publishers, Patent Agents and Engravers,
338 Montgomery street, S. F.

GIANT POWDER.

Patented May 26, 1873.

THE ONLY SAFE BLASTING POWDER IN USE.

GIANT POWDER, NO. 1.

For hard and wet Rock, Iron, Copper, etc., and Submarine Blasting.

GIANT POWDER, NO. 2.

For medium and sesmy Rock, Lime, Marble, Sulphur, Coal, Pipe Clay and Gravel Bank Blasting, Wood, etc.

Its EXCLUSIVE use saves from 30 to 60 per cent. in expenses, besides doing the work in half the time required for black powder.

The only Blasting Powder used in Europe and the Eastern States.

BANDMANN, NIELSEN & CO.,

General Agents, No. 210 Front Street.



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Sixteen well filled pages.
Original and Choice Engravings.
Editorials on Home Industries.
On various kinds of Stock-rearing.
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Correspondence from Farming Districts.
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Good Health and Useful Information.
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DEWEY & Co.,

Publishers, Patent Agents and Engravers, No. 338 Montgomery street, S. E. corner California, S. F.

Laws Concerning Corporations.

[Under the New Code—January 1, 1873.]

GENERAL PROVISIONS APPLICABLE TO ALL CORPORATIONS.
WAGON ROAD CORPORATIONS.
WATER AND CANAL CORPORATIONS.
HOMESTEAD CORPORATIONS.
MINING CORPORATIONS.
LAND AND BUILDING CORPORATIONS.
ALSO, MINING PARTNERSHIP LAW.

A pamphlet containing the above provisions concerning Corporations has been printed from the Statutes of California. It furnishes those who wish these special laws an opportunity of obtaining them for the small sum of 25 cents (post paid). Address, Dewey & Co., Publishers, and Patent Agents, S. F.

THE NEW U. S. MINING LAWS.

The new Laws of 1872, governing the location and purchase of Placer and Quartz Mines and Agricultural Lands in Mining Districts of the U. S., printed in circular sheet, for sale at this office. Single copies, 25 cts. Usual discount to the trade.

C. P. R. R.

COMMENCING

Sunday, May 4th, 1873,

And until further notice, Trains and Boats will

LEAVE SAN FRANCISCO.

7.00 A. M. (Daily). Atlantic Express Train (via Oakland) for Sacramento, Marysville, Redding, and Portland, O. Colfax, Reno, Ogden and Omaha

7.30 A. M. (Daily). Cal P. R. R. Steamer (from Broadway Wharf) Connecting at Vallejo with Trains for Calistoga, Knight's Landing and Sacramento; making close connection at Napa with stages for Sonoma.

2.00 P. M. (Sundays excepted). Stockton Steamer (from Broadway Wharf), touching at Vallejo, Benicia, and Landings on the San Joaquin river.

3.00 P. M. (Daily). San Jose Passenger Train (via Oakland), stopping at all way Stations.

4.00 P. M. (Sundays excepted). Passenger Train (via Oakland) for Lerop, Merced, Visalia, Tipton, and Los Angeles, Stockton and Sacramento.

4.00 P. M. (Sundays excepted). Cal. P. R. R. Steamer (from Broadway Wharf) connecting at Vallejo with Trains for Calistoga, Knight's Landing and Sacramento.

4.00 P. M. (Sundays excepted). Sacramento Steamer (from Broadway Wharf), touching at Benicia, and Landings on the Sacramento river.

6.30 P. M. (Daily). Overland Emigrant Train (via Oakland)—Through Freight and Accommodation.

OAKLAND BRANCH.—Leave San Francisco, 7.00, 8.10, 9.20, 10.10 and 11.20 a. m., 12.10, 1.50, 3.00, 4.00, 5.15, 6.30, 8.15, 9.20 and 11.30 p. m. (9.20, 10.20 and 3.00 to Oakland only).

LEAVE OAKLAND, 7.40, 8.50, 9.10, 10.00, and 11.10 a. m., 12.00, 1.40, 2.50, 3.50, 4.05, 5.20, 6.30, and 10.20 p. m.

ALAMEDA BRANCH.—Leave San Francisco, 7.20, 9.00, and 11.15 a. m., 1.30, 4.00, 5.30, and 7.00 p. m. (7.20, 11.15 and 5.30 to Fruit Vale only).

LEAVE FRUIT VALE (for San Francisco), 7.30, 7.00 and 10.45 a. m., and 3.30 p. m.

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Low Water Alarms, Gauge Cocks, Glass Water Gauges, Cylinder Cups, Self-Oilers, Boiler Felt, Seldene's, Tuck's, Hemp and Soapstons Packing, Stocke, Tape and Dies, Twist Drills, Drill, Lathe and Planer Chucks, Emery Wheels, Etc.

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N. B.—Agents wanted in every town in the State. On payment of \$5, one Stove will be sent as sample.
22725-1y

Mechanics' Institute Election.

Monday, June 2, 1873.

REGULAR TICKET.

J. C. PATRICK.....Hardware Merchant
RICHARD SAVAGE.....Foundryman
CHAS. ELLIOT, Engineer Spring Valley Water Works
JNO. H. MACDONALD.....Millman
J. P. CURTIS.....Contractor and Builder
H. W. JONES.....Real Estate and Collection Agent
P. B. CORNWALL.....President Black Diamond Coal Co.

MAOAZINES.	P. An.	W. E. LOOMIS,
Harper's.....	\$4 00	News Dealer
Atlantic.....		AND STATIONER,
Godey.....		S. E. corner of Sansome and
New York Ledger.....		Washington streets,
Blackwood.....	3 00	SUPPLIES ALL
Hours at Home.....		Eastern Periodicals,
Good Words.....		BY THE
Peterson.....	5 00	Year, Month, or Number
Artbur.....		
Lady's Friend.....		
Harper's Weekly.....	6 00	
Chimney Corner.....		
Literary Album.....	15 00	
London Society.....		
All the Year Round.....		
London Ill. News.....		

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Manufacturers of SOLID EMERY WHEELS. From 1 inch to 3 feet in diameter. EMERY GRINDERS for Stove Manufacturers, Foundries, Machine and Rail Road Shops, Planing Mills and Saw-Mills.

Emery Wheels and Saw Gunning Machines for sharpening and gumming GANG, MULAY and CIRCULAR Saws. A judicious use of Tanite Emery Wheels and Grinding or Gunning Machines, will more than repay the cost in this year's work.

Write for Circulars and Photographs to THE TANITE CO., Stroudsburg, Monroe co., Pa. 9726-6m16p

Mine for Sale at Michigan Bar.

A one-half interest (1,300 feet) in the mine is offered for the sinking of 60 additional feet—the present depth of shaft being 60 feet, well timbered throughout. Parties will have to furnish everything connected with working the mine. Assay value at depth of 48 feet, from State Assay Office, \$10 in gold; silver, \$5 per ton making \$13 per ton.

For further information apply to m15 8td-3ts JOHN J. COLLINS, Lodi, Cal.

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FIRE ENGINES, FORCE AND LIFT PUMPS.

Steam, Liquor, Soda, Oil, Water and Flange Cocks, and Valves of all descriptions, made and repaired. Hose and all other Joists, Spelter, Solder and Copper Rivets, etc. Gauge Cocks, Cylinder Cocks, Oil Globes, Steam Whistles, HYDRAULIC PIPES AND NOZZLES for mining purposes, Iron Steam Pipe furnished with Fittings, etc. Coupling Joints of all sizes. Particular attention paid to Distillery Work. Manufacturer of "Garratt's Patent Improved Journal Metal." Highest Market Price paid for OLD BELLS, COPPER and BRASS.
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Patent Tooth Circular Saws. They have proved to be the most durable and economical Saws in the World.

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HALLIDIE'S Patent Endless Wire Ropeway.

Covered by Numerous U. S. Patents.

IMPORTANT TO

Mining Companies, Civil Engineers, Contractors, Etc.

The system of transporting material, such as Ores, from the mine to the mill, Earths for embankments, Rock from quarries, etc., by means of steel wire rope, has been well tested and found more economical, advantageous and reliable than any other method of transportation; and to the annexed certificates in connection therewith I beg to call the attention of those interested:

EUREKA, Nevada, July 10, 1872.
T. M. MARTIN My dear sir: On your leaving for San Francisco, it gives me great pleasure to hand you my written acceptance of the HALLIDIE TRAMWAY put up by you upon our mine in Freilburg.

It is a perfect success, discharging ten tons of ore per hour with two men's labor. It is perfectly simple in construction, and, as far as I can judge, there is nothing about it to ever get out of order—nothing to wear out. While ours requires but about two thousand five hundred feet of wire rope, I can see no reason why the line could not be extended almost indefinitely with equally happy results. Again, the carrying capacity might be doubled or quadrupled if desired. After several weeks trial upon our mine, the unanimous verdict of all who have seen it is a complete, unquestioned success. If this can be of any service to you, use it in any way you think proper. Very respectfully, O. O. GOODWIN.

EMMA HILL CONSOLIDATED MINING CO., Little Cottonwood, Utah.

T. M. MARTIN, Engineer. The Ropeway constructed by you (HALLIDIE'S PATENT) for the Emma Hill Consolidated Mining Company, has been built in a most substantial and workmanlike manner, and is at this time in splendid working condition. I have seen nothing yet that I have seen it is a complete, unquestioned success. If this can be of any service to you, use it in any way you think proper. Very respectfully, O. O. GOODWIN.

W. W. COLBATH, Superintendent.

"The Vallejo works smoothly with the elevated wire tramway, which carries its load of ore as quickly and easily as if there was no winter or snow in the world."

"Whatever the objections to wire tramways may be on account of their cost, I have seen nothing yet that I have seen it is a complete, unquestioned success. If this can be of any service to you, use it in any way you think proper. Very respectfully, O. O. GOODWIN."

Correspondent Utah Mining Journal, Alta, Jan. 8, 1873.

The Vallejo Ropeway.

The Vallejo Tunnel Company's Tramway in Little Cottonwood, built on the HALLIDIE PATENTED PLAN, is a complete success. It is between 2,500 and 2,600 feet in length, and is supported by thirteen stations. The fall in this distance is about 600 feet, and the wire rope, which is three-fourths of an inch in diameter, will safely and easily deliver one hundred tons in six hours. The machinery is automatic, loading and unloading the sacks or buckets. About one ton and a half can be sent down at one time.

The stations are about two hundred feet apart, and the entire apparatus is strong and safe. As there is no winter or snow, the tramway is about forty feet above the surface of the hill, the Tramway can be worked all winter long, without the slightest trouble.

Utah Mining Journal, Salt Lake, Sept. 24, 1872.

Mining Companies and others desiring to negotiate for the erection of this system of Ropeway, can communicate with me personally, or through Postoffice Box 904.

A. S. HALLIDIE, Patentee, 112 and 114 California Street, SAN FRANCISCO.

WIRE ROPE For hoisting from mines, transmitting power, ship rigging etc., of all kinds and sizes, on hand and made to order.

Wire of all kinds and descriptions, furnished at lowest rates. A. S. HALLIDIE, 112 and 114 California St.

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MINING AND SCIENTIFIC PRESS.

An Illustrated Journal of Mining, Popular Science and Progressive Industry.

BY DEWEY & CO.,
Patent Solicitors.

SAN FRANCISCO, SATURDAY, JUNE 7, 1873.

VOLUME XXVI.
Number 23.

Public Breathing Places.

The attention of the Eastern press has been directed of late to the question of economy in laying out public pleasure grounds. We do not speak of the moral and sanitary benefit of such reservations—long admitted and needing no further argument—but of the real monetary economy, as conclusively proved by recent reports of the Park Commissioners of New York, Brooklyn and Philadelphia. In these three cities a large minded, liberal policy has been attended with the most satisfactory results. When millions of money were called for in behalf of the Central Park of New York, the press, while advocating moderate expenditure, derided the idea that anything but pecuniary loss would follow the execution of the project; and the proposed plan was considered to be little better than actual sinking of funds, so far as any return was concerned. But to the surprise of everyone, and far exceeding the most sanguine hopes of the Board, the Central Park has paid for itself ten times over in the improvement of adjacent property and consequent proportionate increase in taxable real estate. The more extravagant the plan, apparently, the higher the ratio of returns.

To review briefly the history of the Central Park: In 1858 the tract of land lying between Fifty-ninth and One-hundred-and-tenth streets, and Fifth and Eighth avenues, now celebrated as the most beautiful of all artificial pleasure grounds, was a barren waste of unsightly rock varied only by stagnant swamps. A less inviting field for the landscape gardener could hardly have been imagined. To initiate the movement, large prizes—\$10,000, \$5,000 and below—were offered for the best plans submitted to the board. In this competitive examination the leading engineers, architects and landscape gardeners, representing the highest taste and skill of the nation, proffered their various schemes.

That adopted, took advantage of the very difficulties and defects of the site to secure the most pleasing effects. As a work of engineering skill, the park now surpasses anything of the kind. Under the notorious ring management, the department in charge suffered least of all in reputation. Each of the smaller squares was improved during this period, at exorbitant figures; but even with such extravagance and waste the city is more than repaid.

Following the noble example set by the New York commissioners, Philadelphia appropriated large sums in beautifying the Schuylkill and West Philadelphia parks. And now Brooklyn, in perfecting Prospect Park, emulates even the metropolis. In Philadelphia the work was

rendered less difficult by the natural advantages of the situation; and the two parks, on opposite banks of the Schuylkill river, are a source of well founded pride on the part of every citizen of that somewhat conceited village.

In New York and Philadelphia, especially, the managers have shown sound sense in affording every possible facility for advancing the cause of athletic sports. The Schuylkill board, freely gave sites for boat houses on the sole condition, that these should be of stone, and required only that the plans should be inspected before building was commenced. By this policy the park has been ornamented with tasteful and well constructed club houses and, as a matter of course, the boating interests of the city largely promoted. In every way, in each of the three cities we have mentioned,

only thing that in our artificial state of existence cannot be supplied at so much the on-bio foot; but by judicious effort it may be made free as air to all—that is, bad air—even in the most unhealthy manufacturing place.

To refer to a cognate matter, while we are on this topic—the naming of parks. There are two extremes in nomenclature, equally out of taste—the use of such common-place names as Central, South and the like; and the adoption of such high-flown, unmeaning and oftentimes inappropriate terms as Lindon, Wood-lawn, etc. There is no imperative call for imitating the vulgarity of Jersey real estate agents, and there is no necessity for falling back on names befitting railway stations. Let us have either good local names, provided these be well selected, or let us name in honor of our best and most deserving pioneers.

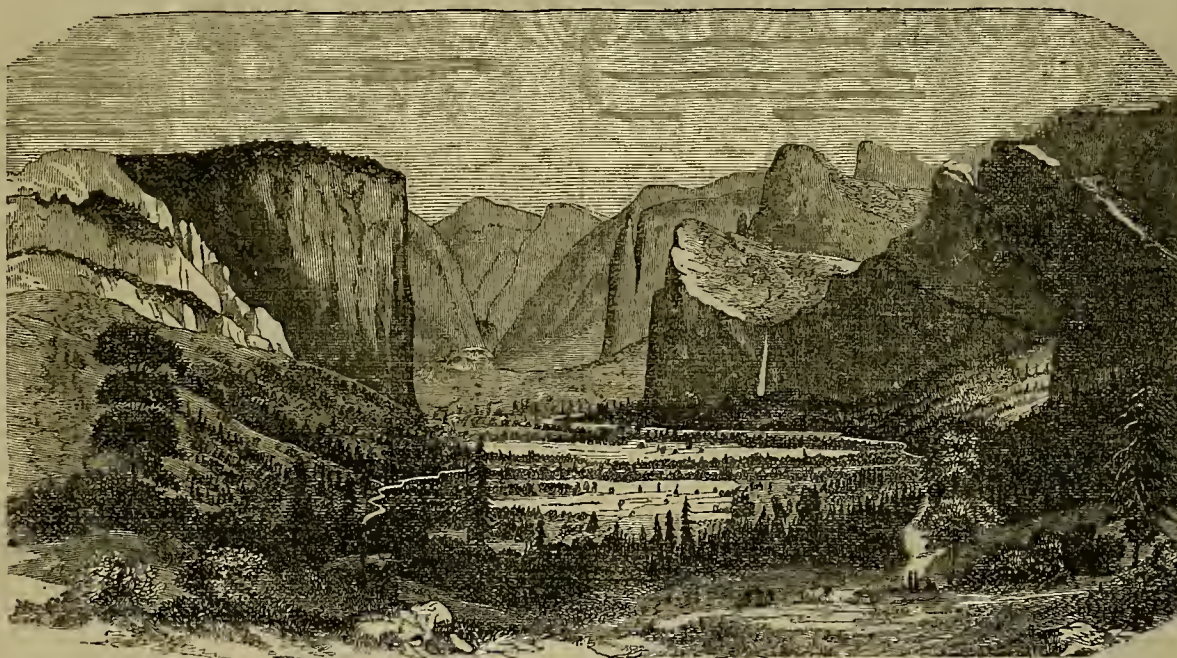
The Park laid out—the Golden Gate—bears a most appropriate and beautiful name, and is now surely but slowly advancing in improve-

Borax.

The last Nevada Legislature passed a law authorizing the taxing of proceeds of borax and soda mines. An Aurora, Nev., correspondent of the Sacramento Union, states that for the first quarter, ending March last, three companies made returns as follows: M. A. Bearn reports gross proceeds, \$12,318; total expenses, \$8,785; net profits, \$3,533, or about \$143 per ton. Mosheimer & Engelke report the net profits of ten tons \$210, or \$21 per ton. The Pacific Borax Company reports the net profits on 113 tons \$1,137.50, or about \$10 per ton.

Judging from this showing, either the borax companies do not make so much money as has been represented, or some rather tall swearing has been done.

There is a very great discrepancy also in the net profit per ton; one company making \$143, and another \$10 per ton. Are their returns intended to discourage the formation of other companies, or to avoid heavy taxation; or do they really represent the correct figures of borax mining and manufacture. It is stated that the borax industry is quite an important one in Nevada, and that all the assay offices, factory and mining companies use the domestic product. The crude supply is said to be inexhaustible. A newspaper scrap before us informs us that one company is putting



YOSEMITE VALLEY, CAL.

base ball, foot hall, skating and model yacht racing have been encouraged, and in no case has this liberality been taken advantage of to injure in any respect the beauty or utility of the grounds.

Such should be the policy of San Francisco. By far-sighted and liberal management our city should be, from its natural advantages, the finest in the world. With our variety of situation, our commanding elevations and gentle declivities, we have all that could be desired. It only needs the careful attention of the citizens to secure the fulfillment of our wishes. And it is evident that to succeed the work should be mapped out far in advance and so allow for our rapid growth. We are glad that some interest is felt in this cause and that at any rate we are not utterly deficient; but yet it can hardly be claimed that we have reached anything really practical. We still have abundant scope for improvement.

If we look at the matter from a sanitary point of view, our conclusions are still more apparent. By reliable statistics it is shown that in the neighborhood of parks the death rate is much decreased, while for the overworked, stifled denizens of the poorer and crowded districts some refuge from foul air and choking dust is all the more necessary. Truly has it been said that open squares are the lungs of towns. Fresh air is about the

ments. After it reaches a state to interest our citizens more than it does at present, more money will probably be spent upon it to the manifest advantage of our city.

Yosemite Valley.

The Yosemite Valley has obtained a world-wide fame for the magnificence and variety of its scenery, and any description of its beauties within our limited space would be impossible, leaving aside the additional objection that the subject is a somewhat hackneyed one, as far as "writing it up" is concerned. The Valley has almost become the Mecca of tourists of the present day, and no one of "traveled" reputation can afford to content himself at home until he has "done" Yosemite. It is to the modern tourist what Rome, the Nile, the Rhine, and the Alps were to tourists a generation ago. In fact, the scenery in this Valley is more magnificent and sublime than in any other part of the United States, or even in Europe, the Alps only being compared to it in these particulars. The illustration shown herewith gives a general view from the Mariposa trail, a favorite point of observation from which to obtain a view of the whole Valley. The prominent landmarks are sufficiently familiar, from the abundance of photographs and pictures extant, to warrant us in omitting any detailed description. A new trail has just been opened, which will afford additional facilities for pleasure-seekers to enter the Valley.

up new works, which will enable them to make four tons per day, which will be worth \$2,000 if it realizes only 25 cents per pound. Judging from the above figures it will not do any such a thing. Will some one who is posted on the subject send us some notes concerning the cost of working one of these claims, with details of expenses and profits. If there is no profit in them they will confer a favor on many individuals in giving this information; and if profitable, there is little danger of overstocking the market with the production. If cheaper than it is, there is little doubt but that more varied uses could be found for it and a fair price paid.

DEER LODGE MINES in Montana show encouraging prospects of a favorable season for miners. There are more claims opened than last year, and water will be more abundant during the mining season than ever before. The gold yield from these mines last year was a heavy one, but it is expected that it will be even more prolific this season. While the placer mines in other counties of Montana have declined in extent and value, the Deer Lodge mines are as productive as usual. As labor, provisions and tools are cheaper than they were, mines can now be worked which were worthless five years ago.

CORRESPONDENCE.

Notes of Travel in Stanislaus, Mariposa, and Tuolumne Counties.

[By our Traveling Correspondent.]

La Grange, Stanislaus county, is located some thirty-two miles east of the county seat of the county, Modesto. It contains at this writing about 400 inhabitants. The principal interest here is mining; but some eight or nine vineyards are located near La Grange, having an aggregate of 200,000 vines, which produce half as many gallons of wine annually. La Grange contains two hotels, and some five mercantile establishments. The mining of this district is gravel or hydraulic diggings. One claim, known as

The Light Claim,

Is located at Patrickville, some three miles distant from La Grange, and owned by H. Light. It contains 120 acres of mining ground; is favorably situated for fall and dump. The improvements of this claim consist of 300 feet of eight-inch pipe, and some 900 feet of bed-rock flume, working an ordinary goose-neck nozzle under a pressure of 80 ft. They expect to use 400 inches of water on this claim within a few weeks. At present it is lying idle. Some two years ago, by working three men and using 250 inches of water, \$100 per day was cleaned up.

The Poley Claim.

Is similarly situated to the above, and the owners are only waiting the action of the Dam Co. to furnish them with water, to proceed to work.

La Grange Ditch and Hydraulic Mining Co.

This is an incorporation of \$5,000,000 capital stock, in 50,000 shares, of \$100 each. Richard Abhey, President; R. E. Brewster, Secretary; and John H. Effinger, Superintendent. The location of the works are La Grange.

This Corporation own a ditch 17 miles in length, of a capacity to carry 3,500 inches of water; their supply of water is taken from the Tuolumne River, at the head of Indian Bar; no dam is used; the ditch starts at a point on the river, where a deep pool or eddy exists; the first 3,000 feet, after the water leaves the river, it is carried in a sunken flume below high water mark, thence through a cement ditch, for a fourth of a mile; the cañon, through which it is carried after leaving the river, is one of the roughest in this State. In some places a stone wall is built to heights varying from 50 to 75 feet. In one place this company have a flume $1\frac{1}{4}$ miles in length. In addition to this company owning a water privilege which cost originally about \$250,000 and employed 1,000 men ten months to complete, they own four different sets of

Hydraulic Claims,

Covering an area of about 900 acres, for which U. S. Patents have been applied for. They are using 8 Monitors and 1 Little Giant Hydraulic apparatus, with nozzles varying from $4\frac{1}{2}$ to 8 inches and using from 400 to 700 inches of water through each, with a pressure varying from 52 to 115 feet, employing about 75 men. The last clean up of this mine after a

Thirty Days' Run

Was a little rising of \$21,000; the average runs of one month each, are expected to average \$25,000. The gold runs from 934 to 942 fine, averaging them over \$19 per ounce.

A peculiar incident occurred during the construction of this corporation's ditch, that is worth mention: A blast known as a

'Seam Blast,

Where some 50 kegs of powder were poured into a seam in the rocks, threw one piece of rock weighing about 10 tons, some half mile distant, on the opposite side of the river, and cut a green pine tree, 18 inches over, off almost as smooth as though it had been sawed down.

Bondurant Minns,

Consisting of two ledges, are located 10 miles nearly east of Coulterville, on the north fork of the Merced river, and are owned personally by Mr. James Shimer, blacksmith and wagon maker of Coulterville. These mines are original locations, one of 1,200 feet and the other consisting of 2,500 feet. These ledges run nearly northeast and southwest, and as far as developed show a ledge of from $1\frac{1}{2}$ to 3 feet thick. The mine is being developed by tunnel and open cut; some 600 feet of tunnel in all; working from 4 to 8 men regularly. The rock is highly sulphuretted, and has for the last 3 years paid from \$12 to \$105 per ton.

Located some 300 yards from this mine, Mr. Shimer has erected an

Eighth-Stamp Mill,

Run by steam power, the capacity of which, is about 8 tons every 24 hours. A good wagon road exists to this mine from Coulterville. There is plenty of timber in the vicinity and a fine spring near by, furnishes the water.

Crystallized Cinnabar.

A ledge located about 5 miles southerly from Coulterville, near what is known as Horse Shoe bend on the Merced river, is one of the strangest formations known in this State, where a

regular quartz ledge exists with well defined walls and containing little or no other mineral than cinnabar, and every atom of it crystallized. It is owned by some parties residing at South San Juan in this State.

Every section of this country has its geins of some sort; Coulterville, Mariposa Co., this State has one in the person of

Adolph Sinning,

Who has manufactured in the past, and has now on hand some most remarkable specimens of workmanship in inlaying and putting together of the fine woods of this county. The following will give a partial idea of some of them: One is

A Beautiful Box,

Manufactured out of the wood of the Big Tree (25 feet in diameter) of the Mariposa Grove, inlaid with twenty-four different kinds of wood, from the Yosemite Valley and its vicinity selected by Mr. Jno. Mizr the Botanist of the Yosemite Valley, viz: Manzanita, Fragula, Black Oak, Red Oak, Live Oak, Laurel, Ceanothus, Big Tree, Buckeye, Alnus Revidus, Madrona, Nutmeg, Alder, Mountain Mahogany, Chemical, Granite, Maple, Box-folia, Chestnut, Oak, Juniper, Poplar, Silver Fir, Willow, Two Leaf Pine. A chest table two feet square inlaid with shading, stars, stripes and gothic panels containing the same number of the different kinds of wood. Also a handsome case of Alnus Revidus wood, selected by Mr. Percy, of Tuolumne County, Cal., containing gold mounting, a Yosemite view, (the cap of liberty,) and silver ferns, and presented by him to Mr. Henry Wilson, Vice President of the United States.

The Patton Mins.

Is located $\frac{1}{4}$ of a mile west of Tuttle town, Tuolumne Co., and about $5\frac{1}{4}$ miles west of Sonora, the County Seat. This property is owned personally by J. J. Corrigan, Esq., resident of your city.

The ledge of this mine runs N. W. by S. E. and pitches to the N. E.; the vein runs from 4 to 50 feet in width, and both the hanging and foot walls, are the most perfectly defined of any mine I have had the pleasure of visiting in the state. D. T. Hughes, Esq., is the Superintendent, and through him I learned the following facts. The extent of the lode, is a fraction less than 1,900 feet, and is being developed by two tunnels run in on the level of the mill, to which the rock is brought in cars. One of these tunnels is run in on the vein, and is now in 450 feet, and 131 feet from the surface. The other tunnel, (No. 2), starting at a point 150 feet south of tunnel No. 1, is now in 240 feet, about 100 feet of which is upon the ledge.

The character of this rock in this mine is peculiar. It consists of quartz, slate, dolomite and calcareous matter; is highly sulphuretted, and everything between the walls pays something. The rock is generally lowgrade, but as the vein is large, easily taken out and reduced, it will undoubtedly pay a handsome profit; the rock in the past has run from \$4 to \$20 per ton. This rock will average about \$10 per ton without counting the sulphurets. This company have just erected a fine

Twenty Stamp Mill,

Which is run by water power. It started up for the first time on May 26th, this year. This mill has a capacity of crushing thirty tons per day (twenty-four hours). Daniel Seiber & Son, of Sonora, are the architects and builders of this mill, which is very complete in every part, and does credit to its designers. Twenty-eight men find regular employment at this mill and mine. One of the most perfect

Self-Feeders,

I should judge, extant, is employed at this mill. It is known as the Cockrane Self-Feeder, and for which letters patent were obtained through your office. It is the most complete feeder, for the reason that it will feed clay, rock, sand or anything from mud to rock. The amalgamation is done by copper plates, silver-plated, and the ordinary riffle. The sulphurets are estimated to go about \$100 per ton.

The Rawhide Quartz Mine,

Or what—for years has been known by that name—now bears another (incorporated name) and is owned by parties in London and New York. It is located at Rawhide Ranch, on the west side of Table Mountain, and distant about 5 miles West from Sonora, Tuolumne Co., California. It is superintended by R. H. Haydock, Esq. and F. Greiner, foreman and superintendent of construction.

This company claim a ledge running N. W. by S. E., which dips to the N. E., and is about 1,700 feet in length. Their claim has been laying idle for over six years, for reasons best known to its owners; but they have now determined to go ahead and thoroughly open it up. Some time in April last the first work was done upon it this last time; by the time this is in print they will put upon their principal shaft a

Large Knowliss Steam Pump,

Which will be worked by the present fine steam hoisting works over their principal shaft which is 280 feet deep. In years past this mine on the average paid well, at times very rich. This Company also own a fine

Twenty Stamp Mill,

Run by steam power, which has a capacity of crushing about 30 tons of ore daily; at present they are only working 5 men, but as soon as the mine is pumped out a large force will be put to work.

L. P. MC.

The Vienna Exposition.

[FROM OUR SPECIAL CORRESPONDENT—GUIDO KUSTEL.]

To commence a systematic description of the exhibited articles at present is impossible. All that one can do, is to walk around for many days and try to acquire a general view, or a total impression of all, before going into a detailed examination. Up to this time about 3,500 railroad cars loaded with goods amounting to more than half a million of hundred weights have arrived. Numbers of these boxes are as yet untouched, in and outside the different buildings, but mostly between the machinery hall and the palace; and that is not all, as there are 2,000 car loads announced to come. The discharging of these cars takes time; there are amongst others, heavy boxes, difficult to handle, so that hardly more than a hundred cars can be emptied per day. By this calculation it will take twenty days more, to place the new arriving goods where they belong.

Nothing was neglected on the part of Baron Schwarz to hasten the work, no hocking occurred during the whole time; there was also plenty of time for the exhibitors to the first of May to have their articles in Vienna, and still everything is behind. It is very likely that, from past and present experience, future "world's exhibitions" will be better arranged and regulated if possible, but it seems also, that there is limit as to the extent of our International Exposition, beyond which a failure may be anticipated.

It is singular, Switzerland excepted, the three great Republics, the United States, France and Spain are most behid with their exhibitions.

In the American Department

"Colt's patent arms" and those of Smith & Wesson's are exhibited in the gallery, in very elegant cases, but nothing else. In the still larger covered yard only one thing is displayed, a picture on the wall of the building, over 50 feet long, from "Pork Packer's Association" of Cincinnati, representing the total procedure, from killing the hogs to making hams. But there is a great amount of American goods in boxes here, and perhaps just as much between Vienna and Trieste, which is expected to arrive in a week or so. The American exhibitors are not satisfied with the present "temporary" commissioners; they had a meeting yesterday, which resulted in the election of a committee of five, as acting medium between the expositors and commissioners. A motion was also made to telegraph to the President, the request to reinstate those of the old commission, who proved to be blameless; but there prevailed good sense enough to discover that is "not our business." All will clear up in a short time, and the American department, as it seems, will make a formidable representation after all.

There is from the 1st to the 10th of May

A Flower Exposition,

To which Austria, Belgium, Italy and Germany, contribute. For this purpose a tent was fixed up, 600 paces long. About 2,000 blooming roses dried up in the station house at Hamburg. A carload of the finest "camellia" was ruined by the frost while on the railroad from Dresden. Nevertheless the Exposition is a magnificent one. Predominant are the splendid varieties of "Azalea" and "Rhododendron." A new specimen of a Japanese rose was exhibited, but there is no use of enumerating the kinds of flowers, there are too many of them. Some exotic plants and palm trees give to the collection a charming aspect. Several more exhibitions of this kind will follow at intervals. Fruit and vegetables were also represented, but at this time not much can be expected; of strawberries, however, (from hot-houses) there were just as large specimens as found in California.

Of Agricultural Machinery

In the English department a nearly complete exposition can be seen now. The large area of 4,500 square meters—equal to 48,700 square feet—is all taken up by luxurions, tastefully equipped machines of all kinds. There are quite a number of different threshing machines, corn-dressing machines, corn screens, hay-making machines, straw elevators, hand seed drills, beet and manure drills, corn-grinding mills, crushing and kibbling mills, moving and reaping machines, etc. There are several huge plows and complete steam plows, some already sold; agricultural road locomotive engines; steam engines, fixed and portable; and a great many other agricultural machines and implements.

The American Agricultural Hall is a separate building, but it will take yet a few weeks before this exposition is ready. In the Machinery Hall all nations are very busy fixing up their departments, but many weeks are yet required to finish the job. In the industrial palace, the glassware is already now well represented, most of it in the Austrian department. In this is also a jeweler's case of limited size, containing only a few articles, but amounting in value to \$650,000. Every night this case, by means of a crank, disappears under the ground in a "tight place." The Crown Prince, of Germany, in the hall of arts, was met by a Yankee, who accosted him in the following way, in English: "Will you do me the honor, sir, to shake hands with me?" "With pleasure, sir," he said so. "Where are you from, sir?" "From New York, sir." "I thought so," said the Prince. "Here is my friend, sir, would you confer the same honor on him?" "Certainly, sir." "Thank

you, sir." The Crown Prince went on smiling. The New Yorkers were satisfied and one of them remarked in a careless way: "He is a pretty good fellow." The London Times is also complaining of extravagant prices in Vienna. There are only a few articles here dearer this year than the last one. The high charges in the restaurants have therefore no excuse whatever, but it is singular that these skimming institutions are principally established by foreigners. The most impudent charges are made in the Russian restaurants, then in the Italian and American, French and English. In the Liesinger Bierhalle they charge 5 cents for soup; in the Italian ironhouse, 25 cents; Roast meat with potatoes in the former, 35 cents, in the Italian 87½ cents, and so on. In the Pilsner Halle, a Frankfurter-sausage and a glass of wine, 20 cents, and the same thing in the American restaurant, \$1. The U. S. Rear Admiral James Alden, commander of the U. S. fleet in European waters, has arrived in Vienna, to visit the Exposition. A large barrel of oakwood will be exhibited, 21½ feet long, and 19 feet diameter in the middle; 35,000 persons visited the Exposition on the 1st of May; of the \$12.50 tickets, about 6,000 were sold. It was a cold and rainy day. For the Hall of Arts, two mammoth paintings arrived to-day, one is from the Belg painter, Wiertz, and has an area of a hundred meters, the other is from Cabanel, 80 square meters. The most of the paintings exhibited by France are the property of the State. Vienna, May 10th, 1873. o. x.

A Card.

EDS. PRESS:—Your correspondent from the Mariposa estate, in his personal allusion, in your issue of May 23d, does me great injustice, and I think that an examination of the correspondence will show that the seemingly innocent shaft was by some one evidently mischievously intended. Had your correspondent been permitted to study the archives of the office of the Mariposa Land and Mining Company, on the estate, of whose affairs he assumes to speak as with authority, he would not have permitted himself to circulate opinions so erroneous. Were the company at hand to speak officially I would not need any personal defence. My reputation is safe in their hands. But as they are not, I must be permitted by you to make my own defence. I was connected with the estate ten months; at the expiration of five months, the company wrote to me from New York for a project of operations upon the estate for the coming year. I sent to them a report of fifty pages, with diagrams, etc., with which they were so well pleased that they published it almost entire—together with extracts from previous reports upon the estate by Silliman and others, in book form for distribution to stockholders and others.

For that month they raised my salary 25 per cent., and for all the subsequent time 50 per cent., removed and subordinated the man who up to that time had held the office, by appointment, as Mining Engineer, and who had made an inglorious failure of everything up to that time, Jan. 1, 1873, and appointed me to the office of "Geologist and Mining Engineer of the Mariposa Estate"—the grandest mining property upon the face of the earth.

They expended no "\$40,000" under my counsel or direction, but less than \$10,000, for which they found one mine, for which they would not take \$40,000, nor any other sum—the great mother ledge of the estate, for which they had never at any point seen, nor any man previously seen able to point out or find—opened it 50 ft. deep, 3 to 5 ft. wide, of \$20 ore, at least; nearly opened it 25 feet deeper at two other places; nearly opened it at two other places on another chimney, 200 and 400 feet deep; laid out elaborate plans for developing the estate, which plans are now being carried out, and at length, when unknown to the Company, the gratuitous embarrassments of my position no longer permitted me to remain, in honor to myself, or in proper usefulness to the Company, I voluntarily resigned on the 4th of April, to take effect on May 1st, at which time I left—May 2d.

On May 1st, a letter was read from the Co., by the manager, in which the Secretary writes: "The President believes Mr. Easton to be, one of the ablest mining men, that has been connected with the Estate for years, and you can say to him, that should circumstances with him so change, that he would again desire the position on the Estate, the President will be happy to receive an application from him. If Mr. Easton has left before receiving this, you will please inform him, of that part of the letter referring to him."

Further comments or defence is needless.

Yours, etc.,

O. W. EASTON.

Geologist and Mining Engineer.
San Francisco, May 26, 1873.

MELTING PLATINUM.—The melting of platinum in a common furnace has been accomplished by M. Violette, of Lille. It is expected that various kinds of precious stones may be artificially produced by melting alumina with borax.

THE BULLIONVILLE narrow-gauge is nearing completion. Gen. Page is busy giving finishing-up orders and superintending the final work.

MECHANICAL PROGRESS.

Grinding Edge Tools.

Edge tools are fitted up by grinding, very much as a plank would be reduced in thickness were a large plain employed, in which were set a hundred or more very small gonges, each cutting a narrow groove. The sharp grit of the grindstone being harder than the iron or steel, cuts very small channels in the surface of the metal, and the revolving disc carries away all the minute particles that are detached by the grit. If we were to examine the surface of a tool that has just been removed from a grindstone, under the microscope, it would appear, as it were, like the rough surface of a field which has recently been sacrificed with some implement which formed alternate ridges and furrows. Hence, as these ridges and furrows run together from both sides, at the cutting edge, the newly-ground edge seems to be formed of a system of minute teeth, rather than to consist of a smooth edge. For this reason, a tool is first ground on a coarse stone, so as to wear the surface of the steel away rapidly; then it is polished on a wheel of much finer grit; and finally, in order to reduce the serrations as much as possible, a whetstone of the finest grit must be employed. This gives a cutting edge having the smallest possible serrations. A razor, for example, does not have a perfect cutting edge, as one may perceive by viewing it through a microscope. And yet the serrations are actually so much smaller than the human hair that the minute teeth cut the hair in twain; but when the serrations on the edge of the razor become so battered up and dull that they will not sever a hair, or cut a man's beard off, the edge must be honed and strapped until the system of minute teeth will be so much smaller than a hair, that several of them will take hold of the smallest hair at once. These suggestions will furnish something of an idea of the operation in grinding and whetting edged tools.

Beginners are sometimes instructed, when grinding edge-tools, to have the stone revolve toward the cutting edge, and sometimes from it. When the first grinding is being done, it is a matter of indifference whether this is done or not; but when the finishing touches are applied near and at the very edge; a grinder can always complete his task with more accuracy if the periphery of the grindstone revolves towards the cutting edge, as the steel that is worn away will be removed more easily; whereas, when a stone runs in the opposite direction, the grinder cannot always tell exactly when the side of the tool is fully ground up to the edge. This is more especially true, when the steel has a rather low or soft temper. The stone, when running from the edge, will not sweep away every particle of the metal that hangs as a "feather;" but when the stone revolves toward the edge, there will be no "feather edge" to deceive the eye of the grinder.

IRON FOR SPECIFIC PURPOSES.—"The quality of bar-iron may differ according to the purpose for which it is to be employed. Wire-iron is manufactured in the charcoal forge, and the double puddling furnace with iron boshes. Easily welded iron is made by allowing a small portion of carbon to remain in the metal, and by expelling, as far as possible, foreign matter. But this, by destroying the fire, will make iron cold short. If we want fibrous railway or heavy bar iron, we must employ a metal from which the carbon is easily expelled, as that from the run-out fires. This is to be puddled in a very warm furnace. Wire-iron should be of the same quality, but the puddling by which it is produced would be inapplicable for railway iron, for the latter would become cold-short. Iron for small rods, hoops, gas-pipe, and wire, ought to exhibit a crystalline fracture, a steel-like grain, which is produced by carbon. But of all other foreign matter it should be free. Silica and phosphorus will not evaporate like carbon on repeated exposure to heat; and the iron which contains either in a non-vitrified state will be cold under all circumstances, and will be useless for wire or any other purpose for which strength is required.

STRENGTH OF MATERIALS.—It is a remarkable fact that the most abundant materials in nature—iron—is the strongest of all known substances. Made into best steel, a rod one-fourth of an inch in diameter will sustain 9,000 lbs.; before breaking; soft steel, 7,000 lbs.; iron wire, 6,000; bar iron, 4,000; inferior bar iron, 2,000; cast iron, 1,000 to 3,000; copper wire, 3,000; silver, 2,000; gold, 2,500; tin, 300; cast zinc, 160; sheet zinc, 1,000; cast lead, 55; milled lead, 200.

Of wood, box and locust the same size, will hold 1,200 pounds; tonghest ash, 1,000; elm, 800; beech, cedar, white oak, pitch pine, 600; chestnut and maple, 650; poplar, 400. Wood which will bear a very heavy weight for a minute or two, will break with two-thirds the force acting a long time. A rod of iron is about ten times as strong as hemp cord. A rope, an inch in diameter, will bear about two and a half tons, but in practice it is not safe to subject it to a strain of more than about one ton. Half an inch in diameter the strength will be one-quarter as much; a quarter of an inch, one-sixteenth as much; and so on.

Compounding Common Steam Engines.

A correspondent of *The Engineer* asks, in view of the manifest saving in the use of the compound engines: "What shall we do with our old engines?" After alluding to some proposed modifications brought forward by the engineers, in answer to this query, he gives his own as follows:

"My idea would be rather to attach a very small cylinder to each side of the large one, and connect them to the large one by a cross-head, let the steam into both of them at once, and the exhaust into the large one; proportion them so that with steam, say, at 50 pounds, the same strain, and no more than what was before, for no more is needed, would be on the beam and connecting rod. Have no cut-off for small cylinder, but follow the steam to the end of the stroke. By this means the old cylinder would be left as it is; perhaps an extra eccentric would be required to move the small valves. By this means I see no limit to the pressure that could be used. The greater the pressure the smaller the cylinders would require to be; the regularity of the engine would not be affected—the power would be applied exactly as before. No doubt the pressure would fail in the large cylinder as the piston neared the end of the stroke, but the steam following at full pressure in the small ones would help to balance the loss.

I have given my idea roughly it may be, and I will conclude by stating this: I have a cylinder 14 in. which will drive the machinery at the proper speed with 25 pounds, but at this pressure the stroke ratio requires to be pretty open. I am of opinion a 10 in. cylinder with 50 pounds would do the same work with a third less coal, or by fitting a slide to cut off in the 14 in. cylinder, say with a third off at the stroke, would come to the same purpose. Were I needing to put up the machinery I would be inclined to put in a small cylinder, and use high pressure; the only thing I would lose I would be unable to increase the power of the small cylinder."

Analogies of Art and Nature.

In casting artillery, the particles of iron over lap each other, horizontally, from breech to muzzle; but the heat wear of the powder soon turns them in towards the chamber of the gun, and it becomes what is called honey-combed—and loses its cohesion, and finally bursts, destroying itself and often gunners. It is only a question of time when each and every piece of artillery will burst, and "no man knoweth the day nor the hour." Any one who can counteract this tendency of the iron to dip towards the heat wear will save the nation vast expense and valuable lives.

Ice forms in a minute triangles horizontally on top of the water, "but when in the sky the spring sun glows," the particles of ice dip from the sun as if to cool their heads in the water—not perpendicularly, but at an angle corresponding to the slanting of the rays of the sun, and gradually approaching the perpendicular as the earth swings southward in her orbit. Thus the iron dips towards the heat; the ice dips from it. The ice is then called "pen-icilling," and is dangerous to walk on. Nor is this all; the sun dip can be seen in the rocks all around us, and the day is not far distant when some one of wealth and leisure will take up this key, clear geology of most of its vast internal fires, of its floods, earthquakes and dark, indefinite periods and unfold the record of the rocks in all their grand simplicity, until the wayfaring man can read them.

CHURCH SPIRES.—Towers and spires have been for centuries appendages to churches; and they are certainly ornamental. Their great expense, however, has caused, in this country at least, foolish attempts at economy in their construction at the risk of their stability. Whereof, of course, to wooden structures. Melancholy illustrations of this occurred in the great blow on the 8th instant, when many church spires were prostrated in New England; the losses in many cases falling upon parishes poorly able to bear them. Now, is it not a pertinent inquiry, whether such catastrophes can be prevented? and if so, how? Spires properly constructed, will sustain a greater wind-pressure than houses built of the same material; why, then, are they so often blown down, endangering life and property? Three causes may be assigned, and these being attended to, spires will be secure.

First, then, there should be a sufficiency of timber of good size and of good quality; second, there should be sufficient fastenings; third, there should be frequent examinations to see that all parts of the spire are free from decay. No timber should be used in church spires except it be of the very best quality and of ample size, and care should be taken that all the main timbers—I speak of those especially in an upright position—are fastened together with heavy iron clamps and bolts, which can be screwed up when slackened from any cause. Builders must not be afraid of expense in the beginning, for it is the highest economy in the end. The tall spire of the Elliot church in Newton, which was watched carefully during the late gale, stood perfectly firm, and why? Because it was built as above described; and it will be found on examination that all the spires which have withstood the storms of the past fifty years in New England, have been erected in essentially the same manner, while those which have fallen before the gales have been cheaply and weakly built.—*Ed.*

SCIENTIFIC PROGRESS.

Scientific Revelations—What is Iron?

Science is a great commoner. He bows down men's cherished opinions with the energy and force of a nine-piuit. In his presence religious notions, which have been nursed for centuries, disappear at his approach, as dew before the rays of the morning sun. With the telescope, microscope, spectroscope, blowpipe, voltaic battery and chemical solvents, he has unsettled things sacred and profane, earthly and heavenly, and left the unschooled and unthinking in a fearful condition of doubt and uncertainty. He as ruthlessly knocks down all scientific pretenders wherever he finds them, and scatters their assumptions with a heavy hand, as readily as any other class. Scientific schools after long years of laborious chemical analysis and laborious dividing, sub-dividing, pulling apart separating, and picking to pieces, entering into the very empire of atomic sovereignty have assured the world that earth, air and water, the elements of the ancients are mere compounds that contained more than three score of elements, among which are gold, silver, platinum, copper, iron, etc.

We have been taught that iron was a pure metal and no mistake. This was an unchallenged and undisputed fact of science; something that could be relied on as definite, fixed and certain—something good to fall back upon in this world of ceaseless changing. But if there be truth in the following, and Prof. Jacobi is not a deceiver or a self-deluded humbug, our iron, the glory of our civilization, the lever of progress and the fulcrum of the arts, is after all but a compound—an hydrate of iron, and it is possible by the time Prof. Jacobi or his disciples shall have thoroughly cooked this ferric dish, a chemical element may be discovered, that is common to all metals, the base of all the existing metallic salts, which are now scientifically regarded as pure metals. Here is the article:

"Professor Jacobi, of Russia, has succeeded for the first time in producing specimens of pure iron, that which hitherto has been considered the pure metal being in reality a compound. The pure iron deposited by the action of the galvanic battery, and which is always rich in hydrogen, being placed by him under the receiver of an air-pump, and heated to redness, disengaged hydrogen in torrents, increased in volume, and changed to a silver-white metal (the true iron), very malleable and ductile, and so soft as to be readily cut with a pair of scissors. Iron thus prepared oxidizes rapidly in the air, and decomposes water below the boiling point. It is probable that hydrogen combines directly with iron, increases its hardness and density, and diminishes its malleability and ease of oxidation.

THE SUN.—Mr. J. Norman Lockyer, in a late lecture on the sun, laid down the following principles as to the absorption and radiation of certain substances. Glass, he says, absorbs and gives out a great deal of dark heat. Rock salt absorbs and gives out very little dark heat. Opaque glass absorbs and gives out much light, whilst transparent glass absorbs and gives out little light. Carbon absorbs and gives out much light and dark heat. Air absorbs and gives out very little light and dark heat. He then went on to explain that the common candle-flame has a chromosphere and photosphere, and that when the flame is disturbed gases are thrown out from its interior towards its exterior, just as is the case with the sun. Moreover, when an image of the candle-flame is thrown by a lens upon the end of a spectroscope, and portions of the flame are then emanated through the slit, many of the phenomena presented by a spectroscopic examination of portions of the sun are likewise seen by the examination of the flame of the candle. When the blue part of the flame of a candle is thus examined, a tolerably fair bright-line gaseous spectrum is seen, projected upon a faint continuous spectrum. When examining sun spots, a general and a selective absorption is visible, especially in the sodium lines, which thicken in proportion to the abruptness of the declivity of the sides of a spot. The greater the pressure the thicker the absorption lines. In the course of this lecture he said that there are bright lines in the solar spectrum, and that these bright lines are far more unchangeable than the dark ones. He concluded by saying that if we accept the theory of Laplace, that the sun is nothing but the condensation of a tremendous nebula, there is evidence that it is a hot globe now cooling, which, after the lapse of untold ages, will roll as a cold, dark ball through space.

THE MILKY WAY.—Eighteen million suns furnish the light for the milky way, which is the greatest feature of our heavens. How far separate these suns may be we know not, but they are so distant from us that light, traveling with its incredible speed, is ages in reaching the earth. One astronomer said he had gone back in the milky way so far as would require 330,000 years for the transmission of its light. Whether the telescope has allowed the human eye to gauge it more or less, the fact stands that the bounds of creation are as immeasurable as their eternal Creator.

CHEAP FURNACE FOR CHEMICAL EXPERIMENTS.—An amateur chemist, who justly takes pride in making a large portion of the tools and implements with which he works, has improvised a furnace and which he has used successfully for two years, and which he describes as follows:

He takes a piece of eight inch stove funnel, twelve or fourteen inches high, and furnished with a cap at the top, which can be removed at pleasure. At the bottom a small hole is cut in the side to receive the pipe from a blower, and the whole funnel is lined inside with pipe clay mixed with clay. Three inches from the bottom the lining is increased in thickness and receives some bits of wire, which form a grate. The blower is eight inches in diameter and three wide, having four fans made of sheet iron, tin, or even pasteboard, as is also its case, and is driven by a small pulley belting from a larger one designed to be turned by hand. The whole arrangement can be secured to a board, that portion under the furnace being protected by sheet iron. In such a furnace he has melted iron and manganese in a few minutes. He prefers coke to coal, as giving a more intense heat. His suggestions appear to be valuable to amateurs who do not wish to incur the expense of a complete apparatus.

WONDERS OF THE SPECTROSCOPE.—That wonderful instrument, the spectroscopist, continues to enlarge our acquaintance with the composition of our solar system, and even of the fixed stars and the comets. Father Secchi has made the astonishing discovery of the vapor of water in the vicinity of the sun spots, and we now know that our luminary contains also in its atmosphere hydrogen, sodium, iron, magnesium, calcium, copper, cobalt, barium, and nickel. The same observer has recently ascertained that the planet Uranus has an atmosphere of considerable extent, and generally transparent. The spectrum of a comet, corresponds exactly with that given by ignited carbon vapor, so that a comet is a little more than a barrel of petroleum on fire; and the variable star *p* Gemini is found to be surrounded by an envelope of burning gas. As regards some of them, at least, we can no longer, therefore, "doubt that the stars are fire."—*Lippincott's Magazine.*

AIR.—An interesting paper on the examination of air, taken from various localities, was lately read by Dr. Sigerson, at Dublin, before the Royal Irish Academy. In air from an iron factory he found carbon, ash and iron. The iron was in the form of little hollow balls, each about two-thousandths of an inch in diameter, and the iron so thin that the light passed through it. In "shirt factory" air were found filaments of linen and cotton. Antimony—from the type metal probably—was discovered in the air of printing rooms. Stable air was shown to contain floating air and scales; and in the air through which tobacco smoke was passing, nicotine, the poison of tobacco, was found in little globules.

CENTRAL HEAT.—Mr. G. D. Symons, of London, Eng., recently made some interesting experiments on the earth's temperature, in an artesian well, 1,300 feet deep. The results show an increase of 20° of heat at 1,100 feet, so that water would boil at a depth of a mile and a half; at a depth of 3 1/4 miles the temperature is 3,000°. As iron melts at 2,800° it is plain that the problem of a central furnace heat at no great distance below the surface of the earth is becoming more and more settled—in fact has already reached what may be considered absolutely certain.

A NEW REAGENT.—Professor Bottger recently announced the discovery of a new reagent which, he asserts, is highly sensitive to the alkalies. It is a coloring extract of the *coleus verschoffelti*, and is produced by digestion, for twenty-four hours, in pure alcohol, to which a few drops of sulphuric acid have been added. The hue is a brilliant red, which turns green on contact with the alkali. It is not affected by carbonic acid, and will detect the slightest trace of ammonia in illuminating gas if moistened and placed against an open jet. The presence of the minutest quantity of a carbonate of any of the alkalies is detected by it.

METEORITES NOW AND THEN.—The meteorites which now arrive upon earth are not of the same mineralogical nature as those which fell in past ages. Formerly iron fell; now stones fell. During the last one hundred and eighteen years there have been in Europe but three falls of iron, whereas there have been annually, on an average, three falls of stone. Perhaps it may even be said that stones of a new kind are beginning to arrive, for falls of carbonaceous meteorites were unknown before the year 1803, and four have been observed since then.

ARTIFICIAL AND SUN LIGHT.—According to Landeberg, a German chemist, artificial light contains 90 per cent. of caloric rays, while sun light contains only 50. To this predominance of heating power as compared with illuminating power in artificial light, he attributes the disagreeable sensation produced upon the eyes. Very thin sheets of mica will intercept the caloric rays, and render the light more agreeable.

PHOTOGRAPHERS' BATES. which have become disordered from the presence of organic impurities, may be restored by placing in champagne bottles, and, after freezing them solid, allowing them gradually to thaw, until only a small lump is left unmelted, which contains, it is said, all the organic impurities.

MINING SUMMARY.

The following is mostly condensed from journals published in the interior in proximity to the mines mentioned:

California.

AMADOR COUNTY.

KENNEDY.—Amador Dispatch, May 31: We were shown a specimen of some very rich rock, which has recently been struck in the new shaft.

GOOD HOPE.—Amador Ledger, May 31: We are pleased to learn that Mr. Charles Deane is about to commence work next week. This mine gives promise of being one of the best, but has remained idle for a long time for the want of financial help to open it up.

CALAVERAS COUNTY.

LOWE STAMP.—Calaveras Chronicle, May 31: Rock of unexampled richness is being taken from this mine at West Point. The product of a small piece of ore of which no gold was visible before crushing, was given us the other day, the value of which was 40 cents. The ledge is immense in size, varying from eight to 20 ft. in width, and every particle of the rock contains gold. Two tunnels are being run upon the lode, both of which are about 200 ft. The Calaveras rock is being obtained from each. Work is being prosecuted with vigor, and the results are of the most flattering character.

AUSTRIAN.—We have been shown some very rich specimens of quartz taken from this mine, near Jesus Maria. It was almost completely covered with yellow metal, and the gentleman exhibiting it, Mr. O. C. Knecht, informed us that when broken in pieces the ore showed richer than the surface. The shaft will now be led down the ledge has been thoroughly prospected for a distance of 300 ft. in length, disclosing the same quality of rich rock throughout. The ledge is wide, and the ore will pay largely for milling.

NEVADA TRANSCRIPT.—June 3: STARTED UP.—Arrangements have been completed for resuming work on the Gold Run quartz mine, near this city, and the machinery was set in motion yesterday. The shaft will now be sunk until the old works, where rich quartz was being taken out, are reached.

U. S. GRANT.—Truckee Republican May 31: The owners of this mine, near Meadow Lake, are making active preparations to work the mine the present season. They have an eight-stamp mill ready for business. The mine is to be worked by the chlorine process and arrangements are being made to erect 2 running furnaces, as soon as possible. There are 7 men at work at the mine at present, and the owners have sent below for additional men, and also for teams for hauling ore, wood, supplies, etc. Parties in Truckee who own ledges near the U. S. Grant are also preparing to develop the mine, and test the ores at the smelting works in this place.

STRUCK IN.—North San Juan Times, May 31: We are informed that Messrs. Carr and Cowles have located a claim of 1500 ft. upon the old "Ferrava" or "French" lead, 1 1/2 miles west of Enreka South in this county, which was abandoned when Ferrava was murdered in 1853, and generally believed to be of no value until struck by the present owners. The gold in the rock is in decomposed sulphurets and is so covered with rust, or oxide of iron, that the ordinary process of crushing and washing does not separate it. Their ledge is 2 1/2 ft. wide, well defined, in the slate formation and admirably located for working.

INYO COUNTY.

BIG STRIKE.—Inyo Independent, May 24: In the whim shaft, from the level of the Omega tunnel, Cerro Gordo, at a depth of 160 ft., a very rich strike of soft carbonate has been made during the past week. From only a seam the vein or pocket opens to a width of from 4 to 6 ft. and is of the best quality. It is a heavy, heavy, gray sand, and smelts about as rapidly as it can be put into a furnace. The Omega is the property of the Swansons Co., and runs into ground covered by the original Front location.

LIDA.—A friend writing from Lida Valley under date of May 7, says that the contractors on the Lida Belle shaft would have the shaft down 50 ft. below the tunnel level in ten days, and that they are taking out considerable quantities of very good ore. The Blue Dick was now 50 ft., with 4 inches of the highest-grade ore and plenty of second-rate. The developments at these depths in these mines are considered generally encouraging.

BULLION.—12,000 bars of silver lead bullion have been accumulated at Beatty's furnaces, and some 8,000 at Belmont. The Corra, the largest daily production at the first-named is now 148 bars, each 30 lbs. weight. Should no accident occur to prevent, the run during the present month will result in 4,000 bars; the highest heretofore made in this same time being 3,000.

KERN COUNTY.

HAVERLY MINER.—May 24: At present Long Tom, No. 2 is to be the leading mine, and it has been worked to a depth of 70 ft. with an average ledge of 2 ft. in thickness and a yield of \$30 per ton. A shaft will immediately be sunk on this mine and levels run, which will take but a short time, then it, in connection with another mine already open, will keep the mill running for a year.

PARPOSEE.—A run of 70 tons of good rock is now being made at the old 5 stamp mill of the Bright Star mine.

MARIPOSA COUNTY.

STORY OF A HIDDEN MINE.—Mariposa Gazette, May 30: The Mariposa Land and Mining Company, last week, leased to Stephen Partridge and another Mexican, a tract of ground on Missouri gulch for the term of one year. The story upon which this transaction is founded is of a very rich quartz vein discovered in 1854 by 3 Mexicans, who, ascertaining that the grant confirmed to Fremont inclosed the premises, attempted to procure a lease from the parties at that time and on several subsequent occasions. Failing in this they covered up their discovery, and declined to reveal its locality. Two of the parties have since died and the third revealed the secret to Partridge. Negotiations were reopened a few weeks ago and the result is a lease to the applicants for one year.

NAPA COUNTY.

QUICKSILVER.—Napa Reporter: There are many new locations made in Napa, Sonoma, and Lake counties; besides, the older mines are being developed to a considerable extent, and now and then a sale made. The Stewart mine, near Calistoga, is being worked with flatter. Thompson, near Pine Flat, are finding splendid cinabar, and is reported sold for \$30,000. The Gem mine, in Lacanoma valley, is reported rich, and on the same range are many late locations made. The Missouri claim is being prospected; also the Lost Ledge. I learn that at the Lost Ledge they have made some late discoveries of very fine 30 per cent. ore, and will in a few days be at work in earnest with smelting works. This mine at one time could have been bought at a small price, but at this time it cannot be had at less than \$30,000, which is a small price for such a mine. There will, no doubt, in less than 12 months, be no less than 1,000 men at work in these new mines. I think there are not less than 75 claims of quicksilver in Sonoma county, of course all will not pay, but who will be the lucky ones?

NEVADA COUNTY.

COE.—Grass Valley Union, May 23: Work in this mine has been suspended for some time. The suspension will continue for a few days. The stoppage is not caused by any bad appearance in the mine, for on the contrary there is a large and rich ledge in the bottom of the shaft.

EMPIRE.—Grass Valley Union, June 3: The Empire yesterday shipped gold bars to San Francisco of the value of \$18,000. The gold was taken out of the mill

after a run of 21 days with 20 stamps. Sulphurets saved will give still more money for the rock crushed. **IDAHO.**—Grass Valley Union June 1: This mine has been constantly at work and in 4 weeks, or 24 working days, took out gold to the value of about \$85,000.

EUREKA.—The Co. cleaned up about \$34,000 worth of gold after 24 days run with 10 stamps. **THE PACIFIC MINING CO.**—They struck the West Idaho ledge in the tunnel about 100 yards ago. The ledge is small at the point at which it was cut, but the character of the quartz is good.

KENTUCKY.—This mine is situated 200 yards northeast of the Idaho. It is a new enterprise and it has very favorable appearance. Machinery has recently been set up, and they are now preparing to prosecute work vigorously. The shaft is down 45 ft., and they are working on it. A great deal of specimen rock has been taken out, and it has the indications of being on the same ledge that its illustrious neighbors, the Idaho and Eureka, are working.

GREENHORN.—The 315-ft. level is driving north and south and 230-ft. level is driving to the south. The ore is of the best quality and the ore mills in the neighborhood of \$18.

NEW YORK HILL.—This is one of the rich mines of Grass Valley, on which operation was suspended about 4 years ago, owing to a combination of circumstances in no way chargeable to the character of the mine. It is situated on Wolf Creek, and rises at a sharp angle to about 400 ft. above the bed of the creek, and can be worked by a tunnel 100 ft. deep, and the shaft had been taken from the mine before its suspension; the ore averages by accurate account \$15 per ton, (not load). The working shaft on the top of the hill is down 700 ft. on the incline with a large ledge of ore all the way, and a fine ledge of rich ore at the bottom of the shaft, from 15 to 20 inches in thickness. The new company is about to run the tunnel to the side of the hill, when it will strike the ledge 150 ft. deep, and immediately under what is known as Jo Wild ground, which yielded rock paying \$100 per ton. The tunnel will be about 250 ft. in length, 130 of which is completed, will drain all the old shafts and will be 75 ft. under the old workings, thus opening ground for at least 2 years' work.

STATE LEDGE.—This mine is looking well and is paying well. In the east drift there is a 4 ft. ledge, and in the west a strong ledge, gold-bearing in all its parts. The supply of ore is improving rapidly in quality, while the free gold of the ore maintains itself. **NORTH STAR.**—The new shaft has a rich but small ledge. Good ore is being taken out of the 8th level, 600 ft. west of the shaft.

OMAHA.—This is situated south of town, on Wolf creek. The famous Lone Jack was located as an extension of the old mine. The Co. is erecting a new overshot wheel, with hoisting gear for a shaft 300 ft. long. The claims were located as early as 1854 by parties who sold them to the present owners. The ledge is about 8 inches thick, and the ore is estimated at \$50 rock.

GREEN MOUNTAIN.—This mine is about to suspend operations. The pumps have all been taken out of the shaft, and the mine will be abandoned. The Green Mountain paid very largely for quartz and ore, but the pay streak seems to have been completely exhausted.

INDEPENDENCE CON.—This Co. will soon have completed 400 ft. of tunnel, and a new contract will be given out if the present contractors should not take the privilege of another 100 ft., which will bring the tunnel under the summit of the hill and to the first parallel ledge. The last 100 ft. of the ore is unusually hard, but a change for the better is noted.

DESERET TUNNEL.—This Co., consisting mostly of French citizens, give an occasional push to a tunnel commenced at the foot of a high range of hills skirting Penn Valley, about 2 miles south of the Independence Tunnel. They will have 150 ft. of hacks at a length of 200 ft. and are now working.

BRANCH CON.—The Co. receive proposals for shaft 4 by 8 ft. wide and 75 or 100 ft. deep on the ledge. Work will commence immediately after the opening of the bids. **GRASS VALLEY NEW MINING CO.**—They are still sinking, but have some very hard ground to contend with, and consequently progress is slow. The ledge is small and the ore is not so rich as the old mine. It is to reach the level of the drift from the old shaft where they have a fine looking ledge of 2 ft.

ROUGH AND READY TOWNSHIP.—The gravel claims of Bagley and Hentress, at the junction of Slate and Deer creeks, are being profitably worked this season. Washing off the accumulated tailings in Deer creek to get at the ledge, they are cleaning off \$10 a day to the hand on the average. These claims cover one mile of the creek, have been worked for a number of years and are good for years to come.

The Coombs Pinyone Company's claims on Randolph continue to yield well. They have a bed of gravel in the tunnel 150 ft. in width from rim to rim of the channel, and are making preparations to work the claim.

On the Reese claims on Randolph Flat a tunnel is being run for draining purposes, and also to wash the surface dirt through it. The rich pay in this claim is found in a seam or ledge of decomposed quartz. A number of claims on the Flat have been located and recorded in Nevada city recently.

PLACER COUNTY.

RICH MINE.—Placer Herald, May 31: From the favorable reports circulated in reference to the Grater Hill Quartz Mine, owned and worked by the St. Patrick Co., we were induced to make a visit to said mine, recently, for the purpose of learning whether all that we heard was true or not. And, as a result, we are forced to believe that much of it is not true. The mine is not so rich as the reports have led us to believe. Through the kindness of the foreman, Mr. Wm. Werry, a gentleman of life-long experience, and a skilled and practical miner, we were shown through the mine from top to bottom, receiving a full explanation of the modus operandi of working the same.

The Co. bought this mine some 6 months ago for a little over \$10,000, and after making the purchase, immediately began work on the same. When they commenced work the shaft was down some 80 ft., and now it is down 214 ft. At the former depth the ledge was from 10 to 12 inches thick and at the latter depth it is about 2 ft. thick, and that every inch of the ledge is good milling rock, averaging, so far, about \$60 per ton. There are drifts run in a short distance at the 60-ft. level and below that, and the rock is of the best quality. The mine has been taken from the main shaft, while sinking, and the time the company have owned this mine they have taken from it over \$30,000, and are now, with a force of 30 men, taking out, basing our calculations on the last clean-up, about \$1,000 per day. The rich strike, reported last week from this mine, was in what is known as the foot-wash ledge, in which at 40 ft. they struck rock that pays \$100 per ton, on a ledge of over 10 inches.

IOWA HILL CANAL.—Placer Argus, May 31: We learn from Judge Spear that the Iowa Hill Canal Co. have now about 160 men at work on the line of their canal, between the Fish and Brown ranch and Iowa Hill, and they will be ready to work completed as far as Tadpole creek this season. The work is progressing rapidly under the Superintendency of William Van Vactor, and thus far has not cost over \$4 a rod.

MINING ITEMS.—Correspondence from Dutch Flat: The Pacific claims, after a run of 528 hours cleaned up \$5,852 81. The Enterprise after a run of 576 hours cleaned up \$3,156 43. The Atlantic after a run of 652 hours made a partial clean-up of \$3,493 81. This claim is now washing. The rich ticket. The Central after a run of 408 hours made a partial clean-up of \$3,213 54; washed from its poorest streak of gravel. It is now washing apparently very rich gravel from the eastern rim. The Gold Run claims, at Gold Run, after washing 720 hours took out \$7,709 05. This

claim is now laid over for the season, because of the large deposit of tailings in Canyon Creek. The Summit, after a run of 600 hours, took out \$5,617 56, but only netted \$2,393 92. The Cedar Creek Company's main ditches are all running a full head of water; their reservoirs are all full and have not yet been tapped. It will have a full supply of water till the 1st of July or later. Its receipts for water for the month of April amounted to \$8,925 81; the entire net proceeds for the month amounted to about \$15,000.

SAN DIEGO COUNTY.

GOLDEN CHARTER.—San Diego Union, May 22: Mr. E. B. Gifford came in from Julian City yesterday. We learn from him that this Co. have finished sinking the shaft to supply air to this Co. Singularly enough they have struck a richer streak of ore in their air shaft than in the main shaft. The vein cut by the new shaft discloses what may be called "specimen" rock. It is literally studded with gold.

STONEWALL.—San Diego Union, May 29: This mine is going on vigorously as ever. Captain Frary is moving around the mine. The ore looks like being taken out, and the mill runs night and day. Night shifts are now being worked in the mine. The ledge is now from 8 to 12 ft. in width, and works beautifully; not a pound of powder is now needed in getting out the rock.

OWENS.—This Co., at Julian City, have now reached a depth of nearly 300 ft. They are at present getting out ore from the 2nd level. The Owens mine and mine are running night and day.

HELVETIA.—This mine is also being worked day and night. They are getting out a good deal of first-rate ore, which is being crushed at the Deerees & Moore mill.

TOM SCOTT.—They have a shaft down 80 ft., where the ledge is from 8 to 10 inches in width, and widening as they go down.

THE BEARY RELIER.—This Co. are doing wonderfully well with their little overshot water-wheel, two-stamp mill. Their tunnel strikes the ledge where it is from 6 to 8 ft. in width, and they are taking out plenty of ore and doing well.

SIERRA COUNTY.

THE BUTTER.—Downville Messenger, May 31: We visited the Butte mines a few days since, and found everything running smoothly, every man in his place, and the whole vast institution working like a clock, for regularity. The amount of work which has been done here since the new company took the mine, in putting up new buildings, putting in new machinery, and fixing up in the first class manner, is simply enormous. They now have 3 fine mills pounding on the ore, of which is the root of all evil. The Superintendent informed us that there were 200 men working in or about the mine.

We also visited the Independence, Mr. Davis, Superintendent. They have about as much work ahead as they will be able to manage this year, building boarding-houses, a new mill, and so on. **MINERS WANTED.**—A large number of gravel miners can find employment at the North America claims at Hepsidam. They are now forced to work a large force of Chinamen, but would be glad to dispense with them if they could procure white men. The claim is paying well as usual.

CO. OF ALLEGHANY.—Mining interests are almost at a stand-still. The Masonic has discharged a number of men, but running the tunnel. Twenty-one is crushing rock to test its value. On the North Fork they have struck gravel of a very favorable character, and they expect to strike gold any day. The South Fork is fully organized, and has a bid made for running tunnel. The lead mine continues as rich as ever. Some hands have been hired for the purpose of washing dirt and the dump is not large enough to hold a large pile of dirt. Much ground is taken up, and operations will probably be commenced in full.

SONOMA COUNTY.

YELLOW JACKET.—Napa Register, May 31: On Saturday last, we visited the lower level of this mine, in company with ladies and gentlemen, this somewhat of a party in Knight's Valley, Sonoma county, on the western side of Mt. St. Helena, and about seven miles in a direct line from Calistoga.

The existence of a cinabar lode in the neighborhood was known some 7 years ago to Mr. P. H. Newbitt, of Los Angeles, who kept his discovery a secret in hopes of acquiring a title to the lode. For some time he has been working the lode, and has informed Mr. Stuart (who owns the land) of the fact, and proposed to show him where the lead was in consideration of an interest in the mine. The proposition was accepted, and about 5 weeks ago the exact location of the mineral was ascertained, and active preparations at once commenced.

TUOLUMNE COUNTY.

GRIZZLY.—Tuolumne Independent, May 24: Crushing commenced at the Grizzly, on the 19th inst. The vein is 9 ft. wide, showing fine gold very well. This mine is on the great mother lode of the Cherokee section of the country, which can be traced for many miles. Hopes are entertained that it has not outlived its usefulness; and that, as in former times, with good management, it will be ranked among the big things of the country. Their old hooks show that their first clean up, in four of the days, was \$3,455; and from February 20th, '68, to September 3d, 1872, \$22,326.50 in cash dividends.

EXCELSIOR.—Sonoma Democrat, May 24: In this mine a body of rich pay quartz has been struck and is now being taken out.

H. Brandt & Co's Gravel Claim. near Hall & Hale's Saw Mill, prospects well, but water to work it cannot be had before the first rains.

D. F. Baxter's Gravel Claim adjoining the Lamphier Quartz claim, Confidence District, is paying well, with excellent prospects ahead.

SONOMA COUNTY.—Napa Democrat, May 31: The Yuma vein, at Pacific Flat, 2 1/2 miles from Calistoga, and formerly called the Nau Mine, has recently been sold to an English Company for \$18,000.

RIOR.—Nick Baull has found another "pocket" in his claim, at the foot of Bald Mountain, near the Brown mine. He took out, in 2 days, 25 ounces, and more in sight.

SHAWWAT.—A contract was made with the Sonora Foundry Co., this week, to furnish machinery for a 10 stamp mill for this mine immediately.

GOLDEN GATE.—We have seen several pieces of rock taken out of this mine this week that prospects well. As the vein is developed, it is represented as increasing in richness, promising to become a very valuable mine.

Nevada.

MONITOR CO.—Reese River Renelle, May 24: Quite an excitement is going on about the big strike in the lower workings of this mine. For some time past, the work about the lower tunnel has been pushed with all possible dispatch. A cross cut has been run back in the hill over 300 ft., with butting prospect, and the discovery is important, from the fact that it pitches northward as it rises, and is going up through unexplored ground, consequently, the chances are that it may reach near the surface, 340 ft. upwards. This same chimney, on the 400-ft. level, is already 10 ft. thick, and it is really one of the finest breasts of ore we have seen for a long time.

The ore bodies on this level already measure from north to south 350 ft., and the pay strata are larger on the lower side of the level than in the steps above.

BELMONT.—This Co. are pushing things along quite lively. Some 20 tons of ore are being reduced daily at the Monitor-Belmont Mill, and if the mill was double its present capacity it would have more than it could do with the large amount of ore now being extracted from the Belmont mines.

EL DORADO NORTH.—This Co. have commenced again in their vertical shaft. They have let a contract for drifting to the vein.

HUMBOLDT COUNTY.

BOLIVIA DISTRICT.—Silver State, May 31: H. C. Merritt, of Austin, who, with Thomas Wren and Josiah McKenney, of the same place, is interested in copper mines in Bolivia, arrived in town from that district last Saturday. He says all the mines in the district on which work is carried on are looking well and producing rich ore. The Amelia ledge, which the above named persons are developing, is looking splendidly. A tunnel has been run on the ledge 120 ft., and the vein is from 1 ft. to 7 ft. wide. A large lot of first-class ore, which it is estimated will yield from 35 to 75 per cent. copper, has been selected from that portion of the ledge extracted in running the tunnel. Kellogg & Co. are engaged in grading a road over the mountain, but owing to the rocky and precipitous nature of the ground over which the road has been surveyed, it will take two or three months to complete it.

CENTRAL DISTRICT.—Mullen & Co.'s roasting furnace now in course of erection, will be completed in a month. Ham Sherer and R. V. Craig are extracting ore from the Teasmer, and having it reduced at the Humboldt Reduction Works. The business is profitable, and it is said to pay remarkably well. The Marietta Co. is proving to be a valuable mine. The Marietta Co. is working steadily on the mine, which is considered one of the best in the district; ore from the lowest level assays well, and the ledge is much larger and better defined than it is nearer the surface.

WASHOE.

BALTIMORE CONSOLIDATED.—Golde Hill News, May 31: Very little has been done in the south drift in the ore deposit at the 225-ft. level. The drift merely cut into the edge of the deposit, and a heavy flow of water being met with, further work has been discontinued till the water drains out somewhat. The north drift is now in about 25 ft., following the east side of the ore. The drift west at the lower or 450-ft. level is being driven ahead as fast as the nature of the ground will permit. It is already in over 60 ft., with the face in tough porphyry.

CROWN POINT.—Daily yield 500 tons. The 1,300 ft. level is yielding the best. The crosscut east from the third floor above this level passed through nine ft. of good ore, but is now in porphyry. The ore breaks nowhere show signs of falling. At the 1,400-ft. level a crosscut east is being made from the main south drift, which is now in about 15 ft. A drill is kept driven ahead in advance of the drift as a precautionary measure against a heavy flow of water being encountered.

WOODVILLE.—This mine shows continued improvement, and the amount of ore in sight justifies the employment of another mill. A fine body of ore is opened out in the lower level, north of the shaft, being evidently a portion of the ore body found in the level above. The north part of the mine is the best, and improves as further developed. About \$1,000 a day in bullion is being shipped from the mine and this good yield is steadily increasing.

SILVER HILL.—Daily yield about 50 tons, keeping the Bacon mill steadily running. The ore sections are generally looking well and the ore extracted gives an average assay of over \$50 to the ton. The north drift at the second level progresses finely, with good ore still in the face.

FRANKLIN.—Considerable difficulty is met with in clearing out the old tunnel, owing to its caving badly in places, but the work is making fair progress nevertheless.

DETROIT.—The south part of the mine, in the Waller's Defeat ground, still looks well, and yields about 20 tons of good milling ore daily. The 300-ft. level from the incline is opened and being driven ahead in good ore.

CALDONIA.—Main drift, second level, now in 73 ft. The rock continues very hard, which, together with the increasing quantity of water, allows of but slow progress.

GRIMM.—The main shaft, from the 1,454-ft. level, is making good progress in sinking, and some good streaks of quartz, giving low assays, are occasionally met with. At the 700 and 1,300-ft. levels, crosscuts are being made in favorable indications.

IMPERIAL.—Water interferes somewhat in sinking the main incline, therefore progress is very slow. The ore assays at the 1,700-ft. level averages about \$30 to the ton.

JULIA.—Sinking the main drift. This drift is in 12 ft., showing ore all the way, the widest portion being 5 ft.

YELLOW JACKET.—Drifting east at the 1,600-ft., and north and south at the 1,000-ft. level progresses as usual.

GOLLAH-PORE.—Daily yield 160 tons. Average assay \$4. The old ore sections are looking well, as usual, but no new developments as yet.

GOULD & CURRY.—A heavy body of low grade quartz is found at the southern portion of the 2d level, and a better quantity is anticipated. The drift south, at the 1,600-foot level will soon connect with the Savage drift, when a much needed air circulation will be secured. A shaft is being driven below the 2d level, therefore work is difficult and slow.

BUCKEYE.—The mine is looking well and giving forth its usual yield of about 20 tons per day. Owing to repairs to the mill last week, the bullion yield was somewhat retarded, but this week the mill is running again all right. The drift east from the first level is now in about 30 ft.

SIXEY.—The indications for ore at the bottom of the shaft were so favorable that it was thought best to stop sinking and put the shaft in thorough condition throughout. This is now being done, sinking is resumed, and a station for a drift is being also put in.

GREEN MINE.—Work going ahead cleaning out and reopening the old shaft preparatory to the practical working and development of the mine. The main tunnel is already cleared out, repaired and a new track laid in it.

BECKER.—Daily yield 570 tons, from the four ore producing levels, the lowest or 1,300-ft. level has been showing great improvement at the south end of the ore slopes during the past week, and day before yesterday the main drift south of the shaft was driven to the Crown Point, unexpectedly cut into ore at the east side, and to-day the whole face is in good ore. This is evidently a continuation of the main ore body at that level, and no new discovery. The ore breaks everywhere look finely, and the yield for the present month will foot up to over 17,000 tons. During the week ending yesterday, 4,081 tons were extracted. The bullion yield will somewhat overrun that of last month. The main incline is 144 ft. below the 1,200-ft. level.

SAVAGE.—Strong hints and current rumors of rich ore developments at the 1600 and 1700-ft. levels of this mine give it a wonderful degree of interest at this time. The drift north to connect with the 1600-ft. level of the Gould mine has been nearly completed, and the connection will be made very shortly, when the requisite ventilation will be secured, much to the advantage of both mines.

HALE AND NONCHON.—Daily yield 70 tons. The three cross-cuts at the lowest or 1700-ft. level are driving east but have not yet reached the east ore vein. A winze being sunk 75 ft. north of the incline is now down 22 ft. below this level and in good ore all the way, worth nearly or quite \$50 per ton. A good body of ore is reported to be at the 1600 ft. level, near the Savage line.

MINY.—The west wall of the ledge was cut through on Tuesday last, in the upper level, and quartz assaying as high as \$180 to the ton, met with. The drift is

[Continued on Page 384.]

The Lovegrove. (*Nemophila insignis*.)

BY RALPH RAMBLER.

We present our readers, with an engraving of one of the earliest of our floral visitors—the familiar Lovegrove.

What daisies, violets, crocuses, anemones, and liverworts are to other countries, the Lovegroves are to the inland valleys of California. They are the first wild flowers on our plains to unfold their beauties to the sun, as the harbingers of smiling Spring. The buttercup alone (*ranunculus*) in our river bottoms precedes them by a few days.

How children love them, and welcome their first appearance! Not many days ago, the writer was driving through our valley, when he overtook a party of five little boys and girls, tripping along the roadside, their faces beaming with health and happiness. "Good morning," children, said we, "which way are you traveling?" "We are looking for flowers," promptly answered one of the smallest of the boys, his bright face the very picture of childish gratification. And so they were. Their dimpled hands were grasping dense bunches of blue flowers, as though they were so many new-found treasures. These treasures were only Lovegroves. No other flowers were blooming, though they were beginning to be abundant. The re-appearance of their bright blue blossoms had filled these innocent hearts with perfect joy. Surely we older ones should admire all such beautiful wild flowers—should, at least, give them a passing thought, if for no other reason than the happiness they bring our children, and the gentleness they naturally instill into their hearts.

The Lovegrove is peculiar to North America. Two species only are found in the Eastern and Southern States. They have small white or blue flowers. All the most beautiful species are natives of California, where we have four kinds, their flowers varying from a half inch to more than an inch in diameter. All have their corollas or flowers divided into five lobes, which are so deeply cleft in some species as to have the appearance of separate petals. These plants vary in height from a few inches to a foot and more. They continue blooming through spring and the early part of summer. Sometimes they open by the middle of January, sometimes in February, and occasionally, in late springs, like the present, not until the 1st of March. Botanists have named the largest species *Nemophila insignis*, or Showy Lovegrove. Its flowers are a deep sky-blue on the outer edge, the center white and delicately pencilled with purple dots. Another is *N. Atomaria*, or Speckled Lovegrove. Its flowers are small, of a bluish white, dotted with chocolate-colored spots. *N. aurita*, or Ear-leaved Lovegrove, has small, purple, bell-shaped flowers. The flowers of *N. Maculata*, or Spotted Lovegrove, are white, with a large violet spot on the outer edge of each of their five lobes. These were first introduced into England as ornamental plants some forty years ago.

The two first mentioned are our common varieties. The first, which is the one figured by our artist, has the largest flowers and a very agreeable odor. It is much the most abundant, and is the most general favorite. Its flowers frequently expand more than an inch, and when fully expanded are quite flat and wheel-shaped, but when partly open they resemble a bell, and hence a name very common for it among California children is Blue-Bells. Lovegrove is only a literal translation of its systematic name, which is from two Greek words meaning to love a grove, and refers to the habit of the plant in the States East of the Rocky mountains, where it is most thrifty in the shade. On our plains, it entirely loses this peculiarity, as it finds no trees to shelter it. So its botanical name is here no longer appropriate. This shows how even plants, like men, can adapt themselves to circumstances. Here they flourish in the greatest profusion on the bare plains.

In speaking of the Lovegrove as one of our first spring flowers, we said it is to the inland valleys of California what violets are to other countries. We might also have said, what one species of violet is to a part of California. For one of the earliest flowers with any pretensions to beauty in the low foothills of the Sierras, along the Merced and the Chowchilla rivers, for instance, is a very handsome yellow violet, with finely divided leaves. In size and shape it is almost a *fac simile* of the common Heart's-ease. Indeed, its general appearance is so much like the latter, which is a native violet of Great Britain, that we may with propriety call our early spring violet the California heart's-ease. But the inner surface of the five petals is a bright yellow, with a purple spot at the base, while the outer surface of its two upper petals is of a royal purple.

San Joaquin Valley, March, 1873.
—Illustrated Press.

COAL NEAR SEATTLE.—E. M. Smithers has been for some time prospecting coal croppings on his farm on the banks of Black River, about ten miles southeast of this city. We are informed that his explorations have resulted in a discovery which far exceeds his most sanguine expectations. He has opened upon a large and well defined ledge of coal of excellent quality, which, from present indications, promises an inexhaustible supply; more accessible than any mine now opened in the Territory. It is directly upon the river bank, where the coal can be loaded upon barges and towed to this city by river steamers which now ply upon the river.—*Puget Sound Dispatch*.

Concentrating Ores.

In a recent issue, we gave an article from the *Reese River Reville*, in which the utility of Krom's Concentrator is so highly spoken of that that journal thinks the whole question of working low grade ores turns on the cost of mining. It appears from the statement of a Mr. Curtiss that the cost of mining there, in consequence of the smallness of the veins, is about \$45 per ton, a cost that at once precludes all chance of profit in the treatment of low grades ores, no matter how economical that treatment may be. This, however, is fortunately not the case with any of the low grade ores of Utah, which usually occurs in such immense deposits that the cost of mining is but a fraction of the amount named by Mr. Curtiss.

The great complaint seems to be everywhere made that the cost of treatment and the loss in treatment so runs away with the profits that nothing but high grade ores prove remunerative, and, as a necessary sequence, but very few mines pay to work. This is probably one of the main reasons why so many persons are desirous of selling mines instead of working them. Independent of the consideration of the subject of cheapening the cost of milling or smelting and increasing the percentage of the yield over the present average by improved methods of treatment, which all will agree is highly necessary and important, it seems to us that concentration is almost as desirable for high grade

The Railway Postal Service.

The importance and value to the public of the railway postal service has not until quite recently been generally understood. A merchant in New York receives his letters from Chicago, mailed in that city only thirty hours before they are put into his hands, quite as a matter of course, without bothering his head about thinking how this is accomplished. But for the railway postal service, it would be an utter impossibility; and the same letter, which now requires thirty hours only, would take perhaps forty hours in transmission. Every year, almost every month, adds to the number of lines upon which railway postal service is placed, and the corps of clerks employed in this most important branch of the postal service of the country is rapidly augmenting.

In his last official report, dated November 15, 1872, the Postmaster-General says regarding the railway postoffice service:

"Railway postoffices continue to receive the special attention of the Department, and the improvement effected during the past year has been most gratifying. Since the 30th of June, 1871, this branch of the service has been largely extended. Eight new lines have been established, with an aggregate length of 2,909

THE LOVEGROVE. (*Nemophila insignis*.)

ores as for low ones, for if the actual value of ten tons of \$200 or \$300 ore can be represented in one or two tons of concentrated material, then the cost of smelting or milling is reduced by the number of tons of tailings thrown out by the operation, and a much better result attained—even though the tailings contain a small percentage of the value of the ore—in consequence of the refractory material, which really causes the loss in milling or smelting being thrown out.

Concentration seems to strike at the root of the whole difficulty with either high or low grade ore, for it at once does away with many of the metallurgical difficulties in treatment, by separating the refractory foreign material from the metalliferous and easily treated portions.

Utah is about entering on a new era, that of working mines in contradistinction to the past practices of "placing" them in foreign markets. Working mines legitimately will benefit and build up the Territory, while merely speculating with them reacts to our injury. This the past has abundantly proved.

A PERSEVERING MINER.—A man, unaided and alone, has been constantly employed for the last three years and over, driving a tunnel into a hill near Swansea, about two miles and a half from Hamilton, White Pine, and has completed over 400 feet into the solid rock.

MUON building is being done on the Divide, and soon the small space left between Virginia City and Gold Hill will be closed up with dwelling, shops, lodging houses and saloons.

miles. The daily service has been increased 6,094 miles, and the annual service 2,224,310 miles, making necessary the appointment of 136 additional postal clerks of various grades."

From an interesting table appended to the report above quoted, it appears that the amount of railroad mail service, in successive years, from the commencement of each service (the railway mail service, be it remembered, not the postoffice service) in 1836, to June 30, 1872, has increased at an average rate of 1,626 3/4 miles per annum. The report for the first year, 1836, shows the annual transportation on railroad and steamboat routes combined. The length of railroad routes was first reported to be 974 miles at the close of the year ending June 30, 1837. The length in 1872, as has been already stated, was 57,911 miles—an increase of 56,937 miles in thirty-five years. The largest increase in length for any one year was for 1872, being 8,077 miles. The first report of the annual cost of railroad routes, uncombined with steamboat routes, was \$531,752, on the 4th of November, 1845. The cost in 1872 was \$6,502,771; showing an increase of \$5,971,019 in twenty-seven years, and an average increase of over \$221,148 per annum. The largest increase in cost for any one year was for 1872, being \$777,792.—*Scrivener's for June*.

A SHALE DEPOSIT has been found in Dry Valley, near Pioche, of such a character and so situated as to lead some to think a good quality of stone coal might be found in the vicinity.

Alameda County Coal.

The Alameda County *Gazette* says: It is an old and trite saying that "distance lends enchantment to the view." This is exemplified in mining excitements. The farther off the field of discovery, the greater the excitement and rush. This holds good in all minerals, coals not excepted. It is evident that the time is not far distant when California will be obliged to depend exclusively upon coal for fuel. The State is sparsely timbered, at best, and the little timber with which nature has favored us is being recklessly destroyed, and no tree-planting done to replace those destroyed. In view of these facts our coal mines are destined to become very valuable, for the dense population with which the future will people this State, and the thousands of steamers which will plow the Pacific waters, as well as the manufacturing establishments which are now and will be built up. In this connection we have a word to say in reference to the coal mines that lie at our very door. Contra Costa county is rich in coal veins, the croppings of which are far superior to those of any mines we have seen on this Coast. Within a few miles of Oakland lie buried in the bowels of the earth greater wealth than even the rich gold fields of the Sierra Nevada range produces. These coalfields can be made a source of wealth to this city, and for this reason, as much as any other, we have urged forward the narrow-gauge railroad enterprise. A railroad will serve to develop these coal fields, and the products thereof can be laid down in Oakland at a nominal cost. Cheap coal will build up manufacturing establishments on this side of the Bay. Parties who gain control of the coal mines of Contra Costa county, lying on the line of the proposed railroad will procure a fortune of far greater value than the Comstock mines. These coalfields cover a large territory, and if they are as extensive as present indications warrant, Contra Costa county can supply the State with fuel for an indefinite period of years. It is an opening for capitalists unsurpassed by any venture offered on this Coast.

How an Indian Catches a Skunk.

Skunks have their uses (when dead and "tried out") both in medicine and arts, and somebody must catch them, bad as they are to get at. On this subject a Yosemite traveller makes the following contribution to natural history, which may do for theory if not practice.

On my way up there, the other day, I saw two Indians up in a ravine slowly and stealthily approaching each other, with their eyes riveted on an object which proved to be a full-grown skunk. The one who was behind held out his hand, and kept moving it round in a circle, the animal watching him all the while. It prepared to make him a target several times, but the Indian's revolving hand seemed to distract its attention, and it did not execute the threat.

All at once the Indian dashed upon it, twitched it up by the end of its tail, and held it high up and cracked its neck with a stroke of his hand.

The whole operation was performed without the effusion of any stench whatever, which appears to be the main point in killing, and the captors bore it away in triumph. The animal seemed to feel itself so ignominiously discomfited and disgraced in being hoisted by the end of the tail, that it abandoned its usual means of defence.

We don't advise boys to attempt playing Indian in just that way. The experiments might cost too much before they learned how.

A STEAM CENTRE.—The large amount of work done on the Pacific Mail Company's dock has made it necessary to devise some means of extending the steam power facilities, and workmen have commenced building a "steam centre." The steam engines are intended to be ninety horse-power, and will supply all the steam necessary for the wharves, elevators, warehouses and steamers, lying at the wharves. Steam will be up all the time, day and night. There will be two boilers, one to relieve the other. Near at hand will also be one of the largest steam pumps, arranged so as to take suction from the bay, and to connect with the Spring Valley water pipes, which run the entire length of the wharves. In case the water should be turned off from any cause, and a fire break out, the steam pumps can be set to work immediately, and draw from the bay all the water that may be required. The improvement, will greatly facilitate the work on the wharf and help to save considerable property in case of fire.

SECRET CANON.—A gentleman from Secret Cañon informs the *Eureka Sentinel* that the mining prospects of that section never looked half so well as now. The Geddes & Bertrand has commenced shipping ore to the Lemon mill. Three large ore-teams arrived yesterday all loaded to the guards. The ore it is thought will work high up into the hundreds. An important strike is also announced in the Hodgdon mine. This was not unexpected as there was every indication of an immense deposit being fully developed at any time. The ore in the Hodgdon is believed to be equally as valuable as that in the celebrated Geddes & Bertrand, the two parties being only a short distance apart, and without doubt on the same mineral belt. Better times may be looked for in that portion of the district than have been experienced there since the first discoveries were made.

USEFUL INFORMATION.

How to Clean Feathers.

Feathers may be cleaned of their animal oil as follows: Take for every gallon of clean water one pound of quicklime; mix them well together, and when the undissolved lime is precipitated in fine powder, pour off the clear lime-water for use. Put the feathers to be cleaned into another tub, and add to them a portion of the clear lime-water, sufficient to cover them about three inches when well immersed and stirred about therein. The feathers, when thoroughly moistened, will sink down, and should remain in the lime-water three or four days, after which the foul liquor should be separated from them by laying them in a sieve. The feathers should afterward be well washed in clean water and dried upon fine nets. The feathers must be from time to time shaken in the nets; and as they become dry, they will fall through the meshes and may be collected for use. The admission of air will be serviceable in drying. The process will be completed in three weeks; and after being thus prepared, the feathers will only require to be beaten to rid them of the dust.

To Clean Banned Feathers.

To clean white, brown or fawn-colored feathers, dissolve some fine white soap in boiling soft water, and add a small piece of pearl ash. When the water is just cool enough for the hand to hear it, pass the feathers several times through it, squeeze them gently with the hand. Repeat the same process with a weaker solution of soap, and then rinse the feathers in cold water, heating them across the hand, to expel the water. When they are nearly dry, draw each fibre over the edge of a small blunt knife, turning it around in the direction you wish the curl to take. Then, if the feather is to be flat, place it between the leaves of a book to press it.

Black feathers may be cleaned with water and some gall, proceeding as above.

Why do we Oil our Whetstones.

Great men sometimes give utterance to arrant nonsense. Professor Tyndall, in his work, "Heat Considered as a Mode of Motion," asks the same question that we have placed as a caption to this note, and replies, in general terms that it is to prevent friction. We have seen it stated somewhere that a little carbolic acid dissolved in the water which is used to moisten a whetstone, will greatly increase the amount of friction, and thus promote the action of the stone on the steel instrument. If this be true, and there be no nonferrous drawback, carbolic acid will prove invaluable to all who have to sharpen tools or grind metallic surfaces.

We oil our hoes for several reasons. The first is, that almost all stones, unless oiled, become glazed or burnished on the surface, so that they no longer abrade the metal. The second is, that most stones, after being oiled, give a finer edge than they do in a dry or merely wet state. The pores of the stone become in a measure filled up, and while the action is rendered continuous, its character is altered. A dry stone is very apt to give a wire-edge to a tool, and although this sometimes happens when oil is used, yet it does not occur nearly so often. Some stones work better with water than with oil.

HAMMERING IRON TO MAKE IT RED-HOT.—In his lecture on "Heat," delivered recently at the London Institution, Mr. G. F. Rodwell alluded to a singular case of motion transformed into heat, namely, the rendering of iron red-hot by repeated strokes of the hammer. If Mr. Rodwell, who is so well versed in the history of science, will turn once more to the works of Robert Boyle, he will see that this "father of chemistry" had notions of transformation of mechanical movement into heat very nearly akin to it, if not quite identical with, those professed at the present day. Robert Boyle alludes to the rapid development of heat in an iron nail by repeated blows of the hammer after it had ceased to travel into the wood. It has been asked whether iron could be hammered cold until it became red-hot. Mr. Rodwell informs us that it can. Having requested a blacksmith to try the experiment, a piece of very tough iron was hammered with a moderately heavy hammer; it became hot, but would not scorch a piece of paper. It was then hammered by two men, one of whom used a sledge hammer, but with no better result. Presently a man, who was working in the shop, said he had often lit his forge fire by this means, before matches were plentiful. He took a nail such as is used for horse-shoes, and, after hammering for less than two minutes with a light hammer, part of the nail was brought to a light red heat. The blows were light but frequent, and the nail was partly turned at each blow.

WHITENING SMOKED WALLS.—A method of cleaning and whitening smoked walls consists, in the first place, of rubbing off all the black, loose dirt upon them, by means of a broom, and then washing them down with a strong soda lye, which is to be afterward removed by means of water to which a little hydrochloric acid has been added. When the walls are dry a thin coating of lime, with the addition of a solution of alum, is to be applied. After this has become perfectly dry the walls are to be calcimined, or coated with a solution of glue and chalk.

HOW TO COOL WATER.—As the warm season of the year approaches a cool draught of water becomes a luxury which we may enjoy with a little care. By the following method, simple and inexpensive, water may be kept almost as cold as ice. Let a jar, pitcher or vessel need for water, be surrounded with one or more folds of coarse cotton, to be constantly wet; the evaporation of the water will carry off the heat from the inside, and reduce it to a low temperature. In India and other tropical countries, where ice cannot be procured, this expedient is common. Let every mechanic and laborer have at the place of his work, two pitchers thus provided, and with lids or covers, one to fresh water for the evaporation, and he can always have a supply of cool water in warm weather. Any person may test this by dipping a finger in water and holding it in the air on a warm day; after doing this two or three times he will find his finger uncomfortably cool. This plan will save the bill for ice, besides being more healthful. The free use of ice water often produces derangement of the internal organs; which, we conceive, is due to the property of the water independent of its coldness.

NATURAL SUCTION PUMP.—Livingstone, the African traveler, describes an ingenious method by which the Africans obtain water in the desert: "The women tie a bunch of grass to one end of a reed about two feet long, and insert it in a hole dug as deep as the arm will reach then ram down the wet sand firmly around it. Applying the mouth to the free end of the reed, they form a vacuum in the grass beneath, in which the water collects, and in a short time rises to the mouth. It will be seen that this simple but truly philosophical and effectual method might have been applied in many cases in different countries where water was greatly needed to the saving of life. It seems wonderful that it should have been now first known in the world, and that it should have been habitually practiced in Africa, probably for centuries. It seems worthy of being particularly noticed, that it may be highly important to travelers in our deserts and prairies, on some parts of which water is known to exist below the surface.

GOOD HEALTH.

Orange Peel Poisonous.

The *Pacific Medical and Surgical Journal* says: Now that oranges are in every child's mouth, it is well for parents to know that fatal consequences may follow the swallowing of the rind. Many years ago we had in charge two little girls, sisters, four and six years of age, who were seized with violent inflammation of the bowels from this cause. One of them died in convulsions, and the other had a narrow escape. Since that time quite a number of instances, similar in character have come under our observation.

Quite recently we saw a child something over a year old, that was attacked with violent dysenteric symptoms, for which no cause could be assigned. The attack came on during the passage of the steamer from San Diego. The symptoms were so identical with those which we had previously noticed to arise from poisoning by orange peel, that we were induced to inquire particularly if the child had had an opportunity of getting this substance in its mouth. We were informed that it had been playing with an orange and nibbling at it just before the attack of the disease. The discharges from the bowels were frequent, and consisted of blood and mucus. After a week of severe enteric inflammation, the child died. We have no doubt that the disease was brought on by the rind of the orange. Though but a small quantity must have been swallowed, yet a very small quantity of such an indigestible and irritating substance will often produce most serious consequences.

EFFECT OF DIET.—The *Pall Mall Gazette* says Monsieur Cabasson has presented to the French Academy, a curious essay on the effect of diet on the moral and intellectual faculties of man. Its influence is, in his opinion, very great. In a passage of the "Misérables" Victor Hugo likens French vivacity to the light French wines, and English ponderosity "portarbeer;" and many Frenchmen are convinced that the distinguishing traits of the two nations may in a great measure be ascribed to the use of these beverages. But M. Cabasson has dived more deeply into the subject, and experimentalized on his own person with various articles of food. Coffee taken on an empty stomach, seems to have produced most startling effects. He informs us that immediately after imbibing it, his ideas acquired unusual profundity, his style in writing was cold but correct, while, on the other hand, his temper underwent a pernicious change; he became morose, egotistical and generally disagreeable. A moderate breakfast restored him to his normal state, and the disappearance of intellectual profundity was compensated for by an influx of genial and generous ideas.

The theory is as yet too undeveloped to admit of the prescription of a particular diet for every vice; but, as a general rule, M. Cabasson assures us that a diet of milk and vegetables is conducive to moral and intellectual superiority, and quotes Lamartine, who, in one of his prefaces, states, with that complacency with which only a Frenchman can talk of himself, that he attributes to diet, "the purity of feel-

ing, the felicity of expression, and the exquisite serenity" which always characterized him. All Lamartine's friends know that he retained this serenity of disposition till his death; if he really owed it to a vegetable diet, it is a pity that the potato does not seem to have the same desirable effect on the agricultural classes in Ireland.

WALKING.—Walking briskly with an exciting object of pleasant interest ahead, is the most healthful of all forms of exercise except that of encouraging remunerative, steady labor in the open air; and yet multitudes in the city, whose health urgently requires exercise, seldom walk when they can ride if the distance is a mile or more. It is worse in the country, especially with the well-to-do; a horse or carriage must be brought to the door even if less distances have to be passed. Under the conditions first named, walking is a bliss; it gives animation to the mind, it vivifies the circulation, it paints the cheek and sparkles the eye, and wakes up the whole being, physical, mental and moral.

There is no unmedicinal remedy known to men of more value in the prevention of constipation than a few miles' joyous walking; let one follow it up for a week—a walk of two or three miles in the forenoon, and as much in the afternoon—and, except in rare cases, when a longer continuance may be made, the result will be triumphant; and yet nine persons out of ten would rather give a dollar a bottle for some nansensous drops or poisonous pills than take the trouble to put in practice the natural remedy of walking. Nor is there an anodyne among all the drugs in the world which is the hundredth part so efficacious, in securing healthful, delicious, glorious sleep, as a judicious walk.—*Hall's Journal of Health.*

PROLONGING LIFE.—An eminent French chemist, Mr. Robing, in a memoir recently presented to the French Academy, announces his belief that the period of human existence may be greatly prolonged, and enters into an argument to show that his belief is based upon sound reasoning. His argument is, that the mineral matter which constitutes an ingredient in most of our food, after the combustion, is in our system to incur and stiffen the different parts of the body, tend to render imperfect many of the vital processes. He compares human beings to furnaces which are always kindled, and says:

"Life exists only in combustion, but the combustion which occurs in our bodies, like that which takes place in our chimneys, leaves a detritus which is fatal to life. To remove this, he would administer lactic acid with ordinary food. This acid is known to possess the power of removing or destroying the incrustations which form on the arteries, cartilages and valves of the heart. As buttermilk abounds in this acid, and is moreover, an agreeable kind of food, its habitual use, it is urged, will free the system from these causes, which inevitably cause death between the seventy-fifth and the hundredth year."

HIGH-HEELED BOOTS FOR LADIES.—A London surgeon, Mr. P. Hewlett, reports several cases of serious fissures of limbs indirectly caused by high heels, which had tripped up their wearers; and he refers also to the distortion and injury to the foot that they often induce. He says: "Last year I was sent for to see a young lady in one of our London hotels. She wished to consult me about her foot. On seeing it I thought its state depended upon her boots, and I asked to see them. The boots were brought in by the lady's maid, but the only thing I could observe about them was the immense high heels. I said: 'It is the high heels of your boots that cause the mischief, and unless you diminish them I can do nothing for you.' She became quite angry, and said she could not alter them. 'I can not do it and will not,' Suddenly she again calmed down, and said: 'Pray, sir, what would people say if they saw me walking about the park without high heels?' I said: 'It is simply heels versus brains. If you have brains, you will cut off the heels; if you have no brains, you will continue to wear them.' She fortunately had brains, cut off the heels, and her foot got quite well."

TAKING MEDICINE.—Napoleon, who was a man of grand intuitions, once said to the Italian Physician, Antonomarchi: "Believe me, we had better leave off all these remedies. Life is a fortress which neither you nor I know anything about. Why throw obstacles in the way of its defence? Its own means are superior to all the apparatus of your laboratories. Monsieur Covisart candidly agreed with me that all your filthy mixtures are good for nothing. Medicine is a collection of uncertain prescriptions, the results of which, taken collectively, are more fatal than useful to mankind. Water, air, and cleanliness are the chief articles in my pharmacopoeia.

MEDICINAL USE OF NETTLES.—Dr. Nicholl says that the greatest preventive of yellow fever in Bermuda, is dried nettle, powdered and used as a condiment in all cooking. The Doctor resides on the Isle of Jersey, and he uses it successfully among his patients. He preserves it like herb teas, and keeps it in a dry place. Dr. Thornton uses it as a styptic. He dips lint into nettle juice, and inserts it into a bleeding nose, with quick effect. He also prescribes it for gonorrhea, for which it is a specific remedy. In this case he grinds fifteen of the seeds, and administers once a day. The juice of the nettle has a singular effect on steel, which becomes flexible by immersion in it.

DOMESTIC ECONOMY.

Different Ways of Making Tea.

The Chinaman puts his tea in a cnp, pours hot water upon it, and drinks the infusion off the leaves; he never dreams of spoiling its flavor with sugar or cream. The Japanese triturates the leaves before putting them into the pot. In Morocco they put green tea, a little tansy and a great deal of sugar in a teapot, and fill it up with boiling water. In Bokhara every man carries a small bag of tea about him, a certain quantity of which he hands over to the hoth-keeper he patronizes, who concocts the beverage for him. The Bokhariot finds it as difficult to pass a tea-booth as our own dram-drinker does to go by a gin-palace. His breakfast beverage is Schitcha, that is, tea flavored with milk, cream, or mutton-fat in which bread is soaked. During the daytime, angrless green tea is drank with the accompaniment of cakes of flour and mutton-suet. It is considered an inexcusable breach of manners to cool the hot cup of tea with the breath; but the difficulty is overcome by supporting the right elbow in the left hand and giving a circular movement to the cup. How long each kind of tea takes to draw is calculated to the second; and when the can is emptied, it is passed round among the company, for each tea-drinker to take up as many leaves as can be held between the thumb and finger—the leaves being esteemed an especial dainty.

When Mr. Bell was traveling in Asiatic Russia, he had to claim the hospitality of the Buratsky Arabs. The mistress of the tent, placing a large kettle on the fire, wiped it carefully with a horse's tail, filled it with water, and threw in some coarse tea and a little salt. When this was near a boiling point, she tossed the tea about with a brass ladle until the liquor became very brown, and then it was poured off into another vessel. Cleansing the kettle as before, the woman set it again on the fire, in order to fry a paste of meal and fresh butter. Upon this the tea and some thick cream were then poured, the lid put into requisition, and, after a time, the whole was taken off the fire and set aside to cool. Half-pint wooden mugs were handed round, and the tea laded into them, a tea forming meat and drink, and satisfying both hunger and thirst. However made, tea is a blessed invention for the weary traveler.—*Chamber's Journal.*

FAMILY SECRETS IN COOKERY.—Disches used to be family possessions handed down by tradition; a mystery hung about them; the imagination was called in to assist. A respectful awe tempered while it enhanced the amount of fruition. The *Rambler*, we think it is, tells of an old lady who kept the secret of an old orange pudding till scarce failing breath enough was left to reveal it to her favorite daughter; and our own childhood can recall disches with something transcendental about them. Nothing that we ever taste nowadays approaches that exquisite evanescent twang, half taste, half odor, which recorded its existence on memory. But we cannot enter further into this, the pathetic phase of our subject, except just to point out how much real pathos may and often does lie round the memory of some dish supreme to childish tastes, served under the direction of now silent lips, and by hands whose cunning remains to our fancy transmitted.—*London Saturday Review.*

RAISIN, CONNECTICUT DOUGHNUTS.—Heat a pint of milk just lukewarm, and stir into it a small cup of melted lard and sifted flour, till it is a thick batter, add a small cup of domestic yeast, and keep it warm till the batter is light, then work into it four beaten eggs, two cups of sugar rolled, free from lumps, a teaspoonful of salt, and two of cinnamon. When the whole is well mixed, knead in wheat flour until about as stiff as biscuit dough. Set it where it will keep warm, till of spongy lightness, then roll this dough out half an inch thick, and cut into cakes. Let them remain till light, then fry them in hot lard.

SOUPS.—All soups are better to be made with fresh uncooked meat, as that which has been cooked once has lost much of its flavor and nearly all its juices. It is therefore better economy to hash or slice your cold meat, and buy fresh for soup. Soup should not boil very hard, as that has a tendency to toughen the meat. Fat meat is not so proper nor healthy for soup as the leaner parts of the finest meat. The fat does not impart much flavor, and is not palatable. Soup may be kept till the next day; before it is heated over again skim off the cake of fat which congeals on the top.

BE CHEERFUL AT THE TABLE.—A correspondent of the *Pacific Coast Journal* writes that paper: "Your advice to be cheerful at meal times, is thrown away as far as we are concerned; we are not only cheerful but jolly. The dinner hour is one of hilarity. Why should I not be happy; I have the best husband in the world, a duck of a hat, a quarter section of land, a log cabin with all the modern improvements. My principal trouble is a disagreement with the hens as to the way they should make themselves useful; they insisting on setting, while I much prefer they should continue to lay."

MINING SCIENTIFIC PRESS

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Saturday Morning, June 7, 1873.
San Francisco.

Legal Tender Rates.—S. F., Thurs., June 5.—buying 85; selling 85½.

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THE UNITED ROYAL SMELTING WORKS of the Kingdoms of Prussia and Saxony have announced through their agent, Mr. Robertson, that until further notice, the works, being overstocked, cannot receive any further consignments. There is a two column editorial in this little item, for, when large works of this kind at such a distance become overstocked, it is about time that works of a similar character and scale should be erected on this coast. It speaks well for the mining interests in one way however, for the ore production must be increasing wonderfully. When will some of our rich men, who have made their money out of mining property, invest a sum sufficient to inaugurate works that will accommodate the vast and increasing amounts of our base metal mines?

THE COINAGE of the San Francisco Mint during the month of May amounted to \$2,760,000 in double eagles, and \$12,000 in half dollars. The mint is to be closed this week for the annual clean-up, which will require three or four weeks. During this period no crude bullion will be received, but fine bars will be taken and coin paid for them the same as usual.

RAILROAD SALE.—The Bingham Narrow Gauge Railroad, Utah, has been sold to parties from Pittsburgh, New York and Salt Lake. One of the heaviest stockholders has started for New York to purchase iron and rolling stock.

GOLD PLACERS.—The Kalama Beacon announces the discovery of good placer diggings at the head of Tontle river.

THE KOSSENTH mine near Silver City, Nevada, is to have a new shaft and workmen have commenced the erection of new hoisting works.

PROSPECTORS from Grant District have brought into Pioche rich looking specimens of free milling ore.

A SMELTING FURNACE is being erected in Spruce District, 85 miles from Pioche.

A Mining Camp Without Capital.—The San Diego Mines.

We have the somewhat unusual instance to record where a quartz camp has, without a single cent of capital, been developed by the energy and perseverance of a few determined men until it has come to be recognized as one of the prosperous ones of California. We allude to the mines of San Diego County, in Julian and Banner Districts, about 60 miles from the city of San Diego. They were first discovered in February, 1870; and although there was an "excitement" in the first instance, it rapidly subsided on account of the prejudice existing among most Californians against the "lower country," and particularly the county in which these mines are situated. Even now, very little seems to be known concerning them outside of the county, and people generally have thought that the accounts in the local papers were exaggerated. We will endeavor to show by a few all-potent, and at the same time reliable, figures, that there is more in these mines than is generally supposed: There are

Two Districts

In which the principal mines are located, Julian and Banner. The formation is slate, sparsely interspersed with granite, and the veins run north-east and south-west. The veins are unusually numerous, though as a general thing small. The auriferous belt is about four miles wide and ten long. The first ledge struck was the Washington, February 22, 1870. It was rich in gold at the surface, but is not now being worked. A number of other mines were discovered and a small Wilson steam stamp custom mill was put up. The camp, however, languished until two very green miners (as usual) who knew nothing about the business, struck a ledge in San Felipe Cañon, while hunting for wild grapes. When this became known the cañon was thoroughly prospected and a number of rich claims located. The majority of them were exceedingly rich in gold, and none were worked but such as showed free gold. A new mining district was formed and called

Banner District.

The cañon in which they are situated is called San Felipe, and the creek of the same name is over 1400 feet lower than Julian city, though only two miles distant. The cañon runs into the great Colorado Desert in ten or twelve miles from the mines.

The principal mines are the Golden Chariot, Madden, Antelope, Kentuck, Ready Relief, Pacific, Aguadiente, Mogul, Montezuma, Chaparral, Ophir, Hidden Treasure, Romeo, Atlantic Cable, Redman, Hubbard, Poor Man, City of Richmond, Last Chance, Buena Vista, Blue Lead, Trail, and a number of extensions of the Golden Chariot.

Several of These Mines

Paid well on the surface, but did not on sinking. Others are now being worked and are paying well. The Redman, the first one discovered in the cañon, is a very large vein, and at one time was thought to be the "king ledge" of the camp. Inexperience in mining operations and financial difficulty has caused it to be temporarily idle. The Ready Relief, next adjoining the Redman on the South, and owned by the Bailey brothers, is in a peculiarly favorable situation for working. They have four good levels running into the side of the mountain, from all of which good ore is being taken. A fine stream of water has been utilized to run a 3-stamp mill, by an over-shot wheel. Ten tons of ore from this ledge some time since yielded \$980. A friend of ours, from there since the writer's visit, states that the mine is now turning out beautifully. The vein is 5 feet wide, and the ore averages \$90 per ton. A shaft is now being sunk on the mine. It is owned by five men. A mill in the cañon some time since took 100 tons of ore from this mine, and after crushing 20 tons, discovered that it would not pay for crushing; whereupon the owners, thinking differently, crushed the rest in an arastra and got out \$60 per ton.

The extension of this mine is owned by Mr. Hubbard. He has a 5-stamp mill, run by water-power, and is making money. The ore from the Kentuck, in this cañon, paid about \$40 per ton. From the Antelope, now idle, selected rock has paid \$4 per pound. Some idea of its richness may be formed from the fact that the owners pounded out enough gold with a mortar and spring-pole to build an arastra, and with both mortar and arastra, got enough to build a 5-stamp mill, engine and all complete, in a few months.

The Golden Chariot Mine

Is the banner mine of Banner District. It was found by G. V. King, in February, 1871, and has proven itself to be the most productive mine in the "lower country." The main ledge was 2 feet wide at a depth of 50 feet. The shaft is now down probably 175 feet. A crushing of the rock some time since yielded

\$23,000, or \$230 per ton. The ore from the upper levels pays about \$190, and from the lower levels about \$200 per ton. In one drift they had 14 feet of pay ore. One run of 50 tons crushed last October, yielded \$8,100 at the mill, or \$160 per ton; 52 tons crushed in August paid \$13,621, or \$257 per ton. The ledge is now quite wide, and is paying at mill \$100 per ton. When first opened the rock was packed to mill on mules; and since they have erected their own mill—a 5-stamp one—the waste rock sorted at that time, is now milling \$100 per ton. They have some 500 tons of this rock on their dump, and are getting out more. The wagon road built to their mill lately, cost them \$1,800. This mine is one of great promise, and bids fair to rival many in older and more prominent mining districts. It has paid all its expenses from the period of its discovery, and a very handsome profit besides. One of the owners—the discoverer—sold out his interest to his partners, last January, for \$25,000.

There are four quartz mills in this district: One Wilson steam stamp battery, belonging to Mr. Whitney, of this city, now in charge of Mr. Begon; the Golden Chariot 5-stamp mill, run by steam; and two water-power mills, one with three and the other with five stamps. They are all wet crushers, and with one exception have copper plates and no pans, settlers, concentrators or arastras. Charges for milling are from \$7 to \$8 per ton.

Julian District.

The prominent mines in Julian District are the Owens, Helvetia, Good Hope, Van Wert, Hayden, Big Blue, Great Eastern, etc. The representative mine of the district is the Owens, which has been incorporated, but is owned by a few parties. It has been more systematically worked than any of the other mines, and has paid large dividends for the past ten months. The shaft when last we heard from it was down 275 feet, and levels have been run at 100 feet from the surface, in ore that paid \$20 per ton at mill. Several levels at a depth of 200 feet were in ore in both sides which milled \$35 per ton. The third level, at a depth of 275 feet, goes east 260 feet and west 200 feet in ore that milled from \$50 to \$60 per ton. Thirty-two and a half tons worked some time since, paid \$40, and ore in considerable quantity has been milled yielding \$75 per ton. During a period of eight months in succession the sum of \$42,319.50 was taken from 920 tons of ore, with 12 men at work. The rock averaged right through \$26.55 per ton at mill. One run of 109 tons turned out \$8,878.28, and 48 tons worked paid \$3,987.40. The ledge is about 3 feet wide. It is owned by six men, and some idea of the value of the lode may be had from the following summary of operations for the last eight months:

920 tons of ore yielded.....	\$42,319 50
Expenses of Extracting milling, etc.....	24,210 25

Net Proceeds for 6 owners in 8 months... \$18,109 40
This paid each owner \$3,036. A fine set of hoisting works is now on the mine, the first shipped to that part of the county except a small set on the Stonewall Jackson mine at the Cuyamaca Mountain. The ledge has been 5 ft. wide, but at present writing is two feet wide at bottom of shaft.

The Helvetia mine has also paid its expenses from the start and has developed itself. The shaft is down upwards of 225 feet, the ledge averaging about 2½ feet; the rock averages about \$30 per ton. The vein is now full three feet wide. A crushing from this mine is made nearly every month and \$30 realized at the mill. A few weeks since a new vein was found at the bottom of the shaft in a place where they never had found ore before.

The Van Wert mine, owned by De Frees, Moore and Taylor has a tunnel now in 200 feet. The ore averages \$50 per ton at mill. This mine was once abandoned after a long tunnel had been run, but these parties extended the tunnel some 20 feet and struck a rich deposit of ore.

The Washington, once the "boss mine," and the first discovered in San Diego county, is being worked on a small scale only; a crushing recently turned out \$40 per ton.

In the Hayden mine, they are down 250 feet; quite a large pile of good rock on the dump. They are taking out a good quality of ore.

The Excelsior belonging to Count Dwarkowsky and Harver, has a vein 2 feet wide at a depth of 40 feet. The result of a recent crushing was \$33 per ton.

The Great Eastern a segregation of the Excelsior is being worked, and pays \$20 per ton at mill.

The San Diego mine cleaned up from a recent crushing \$31 per ton. The Blue Lead, near the Helvetia, is turning out well.

The Stonewall Jackson mine, belonging to Frary and Farley, is about eight miles southeast of Julian City, in an isolated position in the Cuyamaca mountains. A fine ten-stamp mill and hoisting works are in operation at the mine. The mine is being worked systematically and has been well developed. The ledge matter runs from 12 to 16 feet in width. The mill is run by a 40 horse power engine. The lead has been in some instances 20 feet wide and yields from \$12 to \$20 per ton, all through.

Quartz Mills.

The mill of the Stonewall Jackson numbers 10 stamps; that of De Frees & Co., at Julian, 10 stamps; Reynolds & Co.'s mill at Julian, 5 stamps; Whitney's patent steam stamp mill in the cañon has 2 stamps; that of the Golden Chariot in the cañon has 5 stamps; the Ready

Relief mill, 3 stamps; Hubbard's mill, 5 stamps; and Wilson's steam stamp mill near Julian has two stamps. Mr. Wilson has rigged his mill so as to saw wood when out of rock. Fire wood sells in the district at \$5 per cord. Lumber costs 16 cents per foot.

We have given this somewhat extended notice of these mines to show that where

Industry and Perseverance

Are exerted, miners can get along without "waiting for capital." This capital, or want of capital, is the bugbear of all mining camps. These men waited as usual, at first, but capital did not come very fast and they concluded to pitch in and not wait. The result was, they made money. Many mines in the camps which paid well on top "pinched" and were abandoned. Others kept on hopefully, and in whatever mine depth has been attained, good ore has been found without exception. The place had to work out its own salvation. There was no money in San Diego, and San Francisco people were investing elsewhere or dealing in stocks. The mills were all paid for by gold taken from the rocks by the owners.

One mill was brought down by a San Francisco man, who, ignorant of mining made a failure of it. Another was built and through financial difficulties was never started up except for a short and inglorious run, when the sheriff took possession. All those now in camp were put up by mine owners. The people who first came there were all poor, but many of them have made a "home stake" in the country. The mines are situated in the most lovely and best timbered portion of the county; grass is abundant, there is plenty of rain and some snow, and the climate is delightful. The bullion production of these mines was in 1871, \$160,919. In 1872 it amounted to \$488,670; and this year it will be probably doubled. Who says that is not a good showing for a small camp with no capital but pluck and muscle?

Academy of Sciences.

At the last semi-monthly meeting of the California Academy of Sciences, held on Monday evening, Messrs. W. W. Mortague and A. W. Chase were elected members. The contributions to the cabinet included a fine collection of skins of California birds, numbering about twenty specimens, procured in Alameda county which were presented by M. Lorguin. Collections of flowers and grasses from Salt Lake region, also, petrifications from Penitentiary Creek, presented by Mr. Turrill. Specimens of borate of lime, a very beautiful formation of a light-yellow color; received for the Academy by General Hewston, from the Lone Ranch Borate Mining Company. Collections of shells; corals, star fish and other marine specimens procured near Auchem Bay, by A. W. Chase, of the United States Coast Survey. The principal part of the evening was occupied in the reading by Mrs. Carr, of some Mrs., of John Muir, describing the great Tuolumne Cañon. Mr. Muir was the first one to enter this wonderful gorge at its head, and he gives a very graphic description of the beauties of its scenery. A large proportion of the paper was devoted to the subject of the glaciers of the vicinity, and the rivers of California flowing from the Sierra Nevada. The paper will shortly be published in the *Overland Monthly*, and will be an interesting one to lovers of mountain adventure, and fine scenery.

Telegraphic List of U. S. Patents Issued to Pacific Coast Inventors.

FROM OFFICIAL REPORTS FOR THE MINING AND SCIENTIFIC PRESS, DEWEY & CO., PUBLISHERS AND U. S. AND FOREIGN PATENT AGENTS

By Special Dispatch, Dated Washington, D. C., June 3d, 1873.*

FOR WEEK ENDING MAY 20th, 1873.

RAILROAD TIES.—William H. Sterling, S. F., Cal.

SACKING ATTACHMENT FOR THRESHING MACHINES.—Walter Masterton, Stockton, Cal.

STRAW FEEDING ATTACHMENT FOR FURNACES.—David Morey, Watsonville, Cal.

MANUFACTURE OF STUOB.—A. F. W. Partz, Oakland, Cal.

LAMP HEATER.—William Friel, S. F., Cal.

PIPE TONOS.—Frank H. Merrill, S. F., Cal.

ORE FEEDER FOR GRINDING AND CRUSHING MILLS.—Chas. P. Stanford, S. F., Cal.

FASTENING POCKET OPENINGS.—Jacob W. Davis, of Reno, Nev., assignor to Levi Strauss & Co., S. F., Cal.

*The patents are not ready for delivery by the Patent Office until some 14 days after the date of issue.

NOTE.—Copies of U. S. and Foreign Patents furnished by DEWEY & CO., in the shortest time possible (by telegraph or otherwise) at the lowest rates. All patent business for Pacific coast inventors transacted with greater security and in much less time than by any other agency.

BROKE THROUGH.—We see by the *Enreka Sentinel* that the workmen in the Danderberg mine, broke through a few days since into the Jinksville chamber, and both parties thereupon suspended operations by mutual consent, a very sensible conclusion to come to. The ore deposit is one of the largest and finest on Prospect Mountain. The affair will probably be amicably settled.

THE NORTH STAR Consolidated mine, in Star District, Utah, has been sold to parties from Canada.

Compound Engines.—Machinery in New York.

A friend of ours in New York sends us some interesting items in relation to the machinery now being built in New York for the steamship *Tennessee*, and as the engines in question are the largest of the kind ever built in this country, our foundrymen and those interested in such subjects, will be pleased in reading the description. Our friend says that probably the busiest shop in New York at present is that of John Roach & Son. The new engines for the United States steamship *Tennessee*, are rapidly approaching completion, while a fine iron vessel for the Pacific Mail Company's line of steamers is receiving her engines, imported from England by the company. Shortly after the arrival of the *Tennessee* from St. Domingo with the United States Commissioners on board, it was determined, in view of her poor steaming qualities, to replace the machinery therein, designed by Captain Ericsson, with a pair of Compound Engines.

Mr. Roach secured the contract, and at once went at the task of constructing the enormous engines. There is nothing about them of startling novelty, but as the largest pair of compound marine engines ever built in this country, they deserve some special mention. Compound, four cylinders, back acting—this, perhaps, sums up the design in technical language, but a more detailed description will be read with pleasure by our mechanics.

The high pressure cylinders are 40 inches in diameter, and the low pressure ones are 78 "inches" the stroke being 40 inches. These cylinders are placed horizontally on one side of the shaft, the pairs being about 5 or 6 feet apart in the clear. Of course the smaller cylinders are each placed concentrically behind the large low pressure ones. One piston rod connects the piston in each pair of cylinders, and from each large piston, two rods project, one over and the other under, the propeller shaft, where on each side of the condenser the cross heads slide in massive guides. Opposite the cylinders the condensers, a square box filled with tubes, stands, and under each set of guides there is an air pump, the circulating being accomplished with two large Blake pumps.

There are two slide valves on each high pressure cylinder, one for the steam, and the other for the exhaust. The low pressure cylinders each have a patent form of frictionless slide valve, of English invention, which it is hoped will make a great saving in power. The link motions are operated by a pair of inclined cylinders set beside one of the cylinders of the main engine. The surface condenser has about 8,000 tubes, $\frac{1}{2}$ of an inch in diameter, and about 7 feet 9 inches long, placed horizontally in four undivided sections.

The Propeller

Is of composition, weighing between 10 and 11 tons, its diameter is 19 feet and its pitch 33 feet, made on the Hirsch patent. Its blades are broad at the hub, and narrow down gradually towards the circumference. It certainly is a massive casting, and one does not wonder that such engines are required. It is expected that 60 revolutions of this screw will propel the ship at a rate of 14 knots per hour, the speed guaranteed by Mr. Roach.

The Boilers.

Are ten in number, cylindrical, with flat ends, 11 feet 6 inches diameter by 10 feet 6 inches long, with two furnaces in each boiler, and 164 tubes, 7 feet 9 inches long, and $\frac{3}{4}$ inches external diameter; the shell of the boilers being made of iron $\frac{3}{4}$ of an inch in thickness. The total grate surface in all the boilers is 478 square feet, and the heating surface is about 13,000 square feet. It is expected that these boilers will carry 65 pounds, at the usual working pressure, and with a consumption of 80 tons of coal per 24 hours, drive the ship at the speed mentioned. To attain this will be very satisfactory, as the *Tennessee* is no pleasure yacht, being 375 feet long with 45 feet beam. Mr. Henry Lerratt, the Superintendent of the works, has so far produced a fine piece of work, for we understand he is the designer, and it is to be hoped that the expectations of all parties will be fulfilled.

The New Boat

Of the Pacific Mail Line, the "Colon," was built in Chester, and is the largest iron steamer, except for the navy, ever built on this side of the Atlantic. Her engine was constructed by John Elder & Co., of Glasgow, Scotland, and is of the compound type, vertical with the high pressure cylinder of 51 inches diameter on the top of the low pressure cylinder of 88 inches diameter. The stroke is 36 inches. There are four boilers with 12 furnaces each the same in design as those for the "Tennessee," except that the steam on the way to the cylinder passes through a superheater surrounding the stack, which is placed centrally in relation to the boilers. She is a fine ship, but an American engine would have driven her as fast with as little coal as the English machinery. We have not had much large marine works in our shops lately, and it is gratifying to see the activity and energy with which, when obtained, it is performed.

Tuyere Tester for Blast Furnaces.

The water tuyeres employed in blast furnaces are often imperfectly made, and commence to leak water into the furnace soon after they are put into use; but even if perfectly made, they eventually burn out and allow a greater or less amount of water to run into the furnace. The result is the cooling of the furnace, to some extent, thereby diminishing its smelting capacity during the time a leaky tuyere remains in the furnace. Hitherto the only certain means to determine whether or not a tuyere is leaking water, has been to withdraw the tuyere from the furnace and examine it. This separation causes the furnace to be temporarily put out of blast, and necessarily causing great loss of time and consequent loss of profit.

A recent invention, patented through the agency connected with this office by R. A. Fisher, of Eureka, Nevada, is designed to do away with these objections by providing a device by which the soundness of the tuyere can be detected almost immediately without removing it from the furnace.

Figure 1 of the cuts herewith shown, represents a longitudinal section of a common water tuyere in which A A shows the wrought-iron pipe through which the air that passes into the furnace by means of the galvanized iron "wind-pipe," B, C represents the supply-pipe through which the cold water passes into the tuyere. D shows the discharge-pipe through which the water, warmed by passing through the tuyere, is carried off. E is a globe-valve or

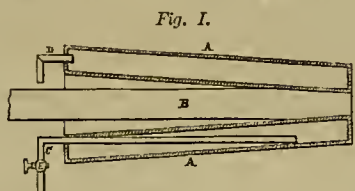
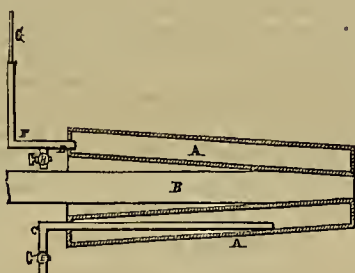


Fig. II.



FISHER'S TUYERE TESTER.

cock, by which to regulate or cut off the supply of water that passes into the tuyere. To determine whether or not a tuyere is leaky, it is only necessary to completely arrest the flow of water through the discharge pipe D and by a suitable contrivance, to determine whether water still flows through the tuyere. This object may be effected by making a section of the supply-tube of glass, and introducing into the glass tube a spiral or other contrivance that will denote a movement of the water; but Mr. Fisher prefers attaching a glass tube to the end of a branch or supplementary discharge-pipe, more particularly described below.

Figure 2, shows the invention which consists, first, in branching out the discharge pipe, D, by the pipe, F, bent at an angle and carried to a greater or less distance above the level of the tuyere and terminating the said branch pipe by a glass tube, G; second, in placing a cock, H, (in Fig. 2) at the end of, or in connection with the discharge pipe, whereby the flow of water through the discharge pipe can be entirely arrested. To determine whether or not a tuyere is leaking water, it is only necessary to close the cock, H, when the water will rise through the branch, F, and begin to overflow through the glass tube, G; then close the inlet cock, E, and if the tuyere does not leak, the water, as it becomes heated, expands and there is a gradual leak, the water falls in the glass tube, G, more or less rapidly, according to the size of the hole in the leaky tuyere.

Mr. Fisher is the inventor of a number of improvements in connection with furnaces, one of which is given in another column of this issue, and another of which—Sectional Slag Pot—was illustrated in the Press of April 26th, 1873. In addition to these he has invented an arrangement for preventing the incrustation of tuyeres, which has been in use for some time at a furnace in Nevada, and after several months use, the tuyeres were found to be as free from incrustation as when first put in. The method employed is a very simple and inexpensive one, and is quite successful. All of these inventions are now in practical use.

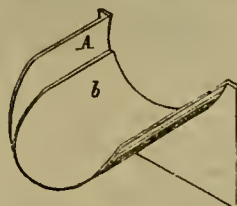
THE CABLE gold mine, near Helena, Montana, is expected to be sold, as \$100,000 has been offered for it.

Wood sells at Pioche for \$7 per cord.

Slag Spout for Smelting Furnaces.

The accompanying cut represents R. A. Fisher's slag spout for smelting furnaces, a patent for which was recently obtained through the Scientific Press Patent Agency. The invention consists in the use of a metal lining for slag spouts which are attached to smelting furnaces. Heretofore the slag running from smelting furnaces has passed directly over the surface of a spout which is attached to the breast plate (front) of the furnace. After a time this spout, becomes so much corroded or eaten away by the molten slag as to become useless, and requires to be replaced by a new one. This replacing of the spout necessitates the stoppage of the flow of slag until the new spout is ready, causing an accumulation of slag in the furnace.

By placing a lining, b, of metal or other suitable material within, and resting upon the bottom of the spout, A, before commencing to



PATENT SLAG SPOUT.

run off slag, the spout is protected from the corroding action of the slag and when the lining requires renewal, it can easily be replaced by a new one at much less cost of time and material than is required to renew the slag spout itself. These slag spouts are now in use at Eureka, Nevada, where Mr. Fisher resides.

Comstock Mines.

Latest Home Views by our Virginia Correspondent.

NUMBER V.

The northern end of the Comstock has been somewhat exercised of late on account of the audacity of two

Land Grabbers

Who run a tailings mill at the foot of Six-Mile Cañon.

Having been successful in their line of business for several years past, and knowing its value as proved by the result of working immense bodies of tailings, collected and purchased from various mills in this locality, a praiseworthy ambition has led them to believe that under the law conveying to the C. P. R. R. Co. grants of alternate sections (odd numbers) of agricultural land lying within twenty miles on each side of their road, all tailings, deposits and water rights lying in said sections, on ground heretofore located and worked as mineral lands in this vicinity, can be condemned for agricultural purposes and as such purchased from the C. P. R. R. Co.

An agreement to this end has been entered into by these parties with the C. P. R. R. Co., money deposited, and a bond for a deed given, to be delivered when the title shall be received from Government for this agricultural (?) land. They have also applied for grants of certain portions of even sections Nos. 20 and 28, Township No. 17, Range 21, east M. D. Meridian—if agricultural—belonging to the State of Nevada for the same purpose.

No scientific or practical miner will dispute the fact, that all lands lying within five miles of the reputed boundaries of the Comstock lode, its extensions, branches and spurs, and the various reputed ledges lying to the east and west of this vast deposit, are, and should be indisputably pronounced, mineral lands, and only a brain craved with success, or an imbecile, would support the claim now in question.

The parties above referred to have made several extensive and important locations, covering valuable mineral lands, on and over the Comstock lode, including the Monte Christo Mining Claim, the ground owned by, and the tailings deposits of, the Winfield, Bassett, and Land Mills—an old tunnel of Ophir S. M. Co., a portion of the ground claimed and owned by, and crossed by the croppings of, the Sierra Nevada Mining Co., and on which lies an extensive deposit of tailings from their mill, now and for years past in uninterrupted operation,—then by (for themselves) a skillful coup d'état, skipping the ground of the Utah Mining Co.,—crossing westward they ask for the ground on which the Cedar Hill Tunnel is started, on Section 20, running westerly 3,800 ft., on to Section 19, the N. E. quarter of which they claim. This Tunnel is now owned by the Virginia and Gold Hill Water Company, having been acquired by purchase from Float Rock Mining Company No. 2, by whom the ground was located in 1859, and worked for mining purposes—the

tunnel in its progress showing streaks of quartz and ledge matter, and now furnishing about twenty inches of water—this being the principal source of supply for Virginia and Gold Hill.

All the above leads were pronounced by the first Surveyor General of the State, to be mineral lands, and acting on this assurance of government and State protection, they have been developed and improved at a cost of over half a million dollars.

The Audacity of the Scheme

Is unparalleled, as, if successful, it amounts to nothing less than highway robbery; and the idea of its accomplishment is ridiculous, as the parties in question have not only the Va. and Gold Hill Water Company, and the Sierra Nevada and Monte Christo Mining Companies to contend with, but all the mining companies on the Comstock, for the success of this enterprise would endanger the property of our mines, and of all mills producing tailings to be condemned for agricultural purposes. The parties of the first part, however, show their weakness by relinquishing a portion of their claims in the face of power. Superintendent Requa, of the Chollar Company, having induced them to waive their claim to the Winfield mill, and Major Edington, Superintendent of Union Mill Company, having quietly accomplished the release of their claim to the grounds owned by Nevada Mill.

The case, styled C. P. R. R. Co., and others, to have certain lands declared non mineral, is now on trial before Register Waitz, of the Land Office in Carson, by whom all testimony will be taken, and with his opinion submitted to the Commissioner of the General Land Office, in Washington, for final decision.

The plaintiffs have summoned a surveyor, Mr. Hocholzer, a householder, a Justice of the Peace, a saddler,—all of whom live in Carson, fifteen miles from the Comstock, on agricultural land,—and one practical miner, Mr. James Rule, of Virginia City, as experts, to prove that the grounds claimed are purely agricultural,—the latter gentleman, however, in his examination, last Friday, testifying that he had superintended a mine and milled ore from the same, located on one of the sections in question. The case will probably occupy the next two weeks in taking testimony, when the summary will be forwarded to Washington for final action.

The Decision

Will be awaited with interest, although with little doubt as to the result, as the parties proposing to prostitute the mineral resources of Washoe, and, at one fell swoop, to convert the immense and valuable property of several of our largest incorporations to private use, without paying a dollar's consideration, can only call down upon themselves the contempt and execration of all fair-minded men.

The Past Week

Has shown no special change in the upper end of the Comstock. Work in the Virginia mines is going on nicely, without interruption.

Chollar is doing nothing as yet, on the body of ore lately discovered on their 800 feet level, which they seem to be holding back for some mysterious purpose.

The body of ore, recently discovered on 1,600, foot level in Hale & Norcross, is improving as far as explored.

Sevsge, have not commenced crosscutting on their body of ore as yet.

Reports give Gould & Curry credit for a good body of ore on their lower level, south, which improves rapidly as they drift on it.

In the Consolidated Virginia, the ore body improves as they drift north towards their shaft.

Ophir is running some crosscuts on their 700, 1,100 and 1,300-ft levels, which are rapidly approaching the ledge, and from which much is expected.

On the lower end of the lead, the Crown Point and Belcher are looking exceedingly well, especially the Belcher on their 1,300 south.

No change is noticeable on the S. W. branch, which includes the American Flat Mines.

On the S. E. Branch,

Silver Hill, is constantly improving in the north, and also in the south chimneys. Winze from 1st to 2d levels is down 45 feet in elegant ore, assays of yesterday ranging from \$200 to \$3,800. The future of this mine looks flattering, as it promises to become one of our leading ore producing mines.

The Dayton expects to cut the ledge on their 224-ft. level within thirty days, the drift went being to-day, in 50 feet.

The Kossuth Co. have, during the past week, appointed Mr. James Rule, Superintendent. Their new shaft has been located, and active operations commenced.

For the last few days there has been a better feeling on the street than previously noticed, and the firm confidence in a prospective general development along the line, together with the knowledge that this can be accomplished, imports a healthy aspect to the market generally.

Virginia, June 3d, 1873.

THE GREAT TUNNEL at Blackhawk, Colorado, of which we spoke last week, has actually been commenced. It will be 20 feet wide by 12 feet high, and will drain a large extent of country. It will take 5 years to complete it, and will cost \$5,000,000. The tunnel will run by mainly by English capitalists, and will extend from Blackhawk on the east side to the rim of the Middle Park on the west side of the Suway range.

The Cederberg.

Last Sunday we visited the celebrated Cederberg claim, which is unique, unlike anything ever before discovered, a marvel and a mystery to the most experienced miners. In common with a majority of Californians, we, when we saw the first of the extraordinary specimens from the Cederberg, at once concluded that the discovery was a mere pocket, that it would "peter out," and that there could not possibly be any permanence or reliability about such a mine. But month has followed month, year has succeeded year, a ten stamp mill and good steam hoisting works have been erected and paid for out of the proceeds of the mine, dividends to the amount of forty-eight thousand dollars have been disbursed to the stockholders in the new company, to say nothing of the amount taken out by the original discoverers, and still there seems to be no diminution in quantity or change in quality of the sheets and plates and tangled masses of wire—all bright, shining gold—in the Cederberg.

On the occasion of our late visit, accompanied by the original discoverer of the mine, we were hospitably received and entertained by Superintendent Hulbard, who afforded us every facility for a thorough examination of the mine, mill and works. The mill and hoisting works have been erected with due regard to economy and with cautious reference to the peculiar character of the mine and with apparent deference to the idea that it might not prove permanently rich. But the mill engine is sufficiently powerful to run double the number of stamps now operated, the hoisting engine will take the shaft down three hundred feet, at which time, if the past and present prospects are verified, there will be ample justification for erecting more permanent and expensive works. The mine is in every respect peculiar and wonderful. It is divided into three distinct parts and has three distinct shades of character, if we may be permitted to use this expression in the connection. Adopting the phraseology of the Superintendent, there is the "bull ledge," "the platform ledge," and "the Cederberg seams." The latter are a succession of quartz seams, from two to eight inches in thickness and constituted the original discovery by Cederberg and Hansen. These seams occur in the rocky face of the bluff hillside, from which there appears to have been a slide, and Mr. Cederberg expresses the opinion that this slide occurred before Adam made his appearance on earth. Cederberg, when he first commenced prospecting for this quartz, had become satisfied that it must be right there and wonderfully rich, and after two long and weary years spent in fruitless labor, sinking shafts, running drifts, and after he had run out of money and out of credit, these marvelous seams were brought to light by sluicing off the superincumbent mass of what he styles "pre-Adamic" stone and rubbish. All the world, including Queen Victoria, of England, and the Emperor Alexander, of Russia, have seen more or less of the beautiful and rich specimens from the Cederberg seams, and the end of them is not yet.

Just below and to the westward of the seams is "the platform ledge," so-called because it was sunk upon from the platform of the former seam workings. This platform ledge has walls varying from one foot to ten feet apart. This fissure is filled, not with a regular ledge but with a conglomerated mass of broken quartz, talc, trap, slate and an indescribable mixture of similar substances. As above remarked, this fissure is in places ten feet wide. It has been followed to a depth of eighty feet, everything that comes out of it has been passed through the mill, because of the impossibility of separating the pay rock from the refuse, and the result throughout a period of over a year and a half, has been an average of fully eighteen dollars per ton. A short distance to the southward and westward from this another shaft has been sunk, which is down more than a hundred feet, and which it is proposed, as a certain operation, to sink to a depth of at least three hundred feet. At the hundred foot level a drift has been run, partly for the purpose of rising to the platform ledge shaft to obtain a circulation of pure air, and partly for prospecting purposes. The old shaft has been tapped, there is a fine circulation of air and on the strength of certain indications and prospects a branch drift has been run to the northwestward, following, so far, for a distance of thirty or forty feet, a series of seams that are literally loaded with plates and veins of gold and bunches of precious metal which resemble tangled masses of fine spun wire. With pick and penknife, during our brief visit last Sunday, we exposed gold enough to have paid for at least a week's hard labor. To the westward of the platform ledge, still farther down the hill, but only separated by a wall a few feet in thickness is "the bull ledge," solid white quartz, several feet in average thickness, which so far as prospected has yielded only a limited amount of very fine gold, fine as snuff, not rich enough to pay for extraction and milling. This ledge pitches to the eastward at an angle of nearly forty-five degrees. At and near the surface the seams and platform ledge pitched in the same direction at an angle of fifteen degrees or more, but now they are descending almost vertically, and there is every indication that the whole will converge and unite before the new shaft shall have reached a depth of three hundred feet.

And what then? Will the whole then be characterized by the comparative barrenness of the bull ledge, or will it show the effects of the fruitifying influences which have made the seams and the platform ledge so marvellously rich? We consider the chances in this case about even, but if at any workable depth, a main ledge is found at all approximating the richness of the seams, the Cederberg will be the richest mine ever discovered. So mote it be!

Of the Sliger, which is unmistakably a true fissure, and whose future seems hardly at all problematical, we shall have something to say hereafter.—*Mountain Democrat.*

Silver in the Old Dominion.

The Gallipolis (Va.) Bulletin has the following article: More than a year ago, Henry Pike, of New York city, took several specimens of ore from the land he now owns in Putnam county, West Virginia, to New York, and left them lying in his office. The samples were quarried by Mr. Pike, and taken by him as specimens of "black band" iron ore, and considered rich. After being in his office for some time, Mr. Pike's brother, the late S. N. Pike, happened to come in and seeing the ore lying on the floor, examined it. He at once said, "This is silver ore, and closely resembles specimens of ore from silver mines in Utah in which I am interested." He advised that the ore be subjected to assay, that the truth of his assertion might be tested.

Henry Pike thereupon placed one of the samples in the hands of Messrs. Sderick, Sears & Co., 18 Maiden Lane, New York city, assayers and refiners (one of the largest and most responsible firms in the country devoted to this business), and on the 23d of April, 1872, they made the following report, which we copied from the original:

"Received from Henry Pike one sample ore, which, upon test, yields to the ton of 2,000 pounds 48.8 ounces of silver. Value per ton in gold coin, \$56.61."

For the purpose of more thoroughly testing the matter, Mr. Pike took another sample to the same parties, and on the 25th of April, 1872, received a report, stating that the sample "upon test, yields to the ton of 2,000 pounds 94.90 ounces silver. Value per ton in gold coin, \$123.42."

Another (and inferior) sample was taken to George W. Platt, refiner and assayer, No. 4 Liberty street, New York, and on the 26th of July, 1872, he reported to Mr. Pike, that upon test it yielded to the ton, in gold, \$35.64.

The samples assayed were from the outcropping of the vein. The vein is from six to eight feet in thickness, and inexhaustible in quantity, underlying a vast extent of country.

The important discovery which we here chronicle was made by digging for coal, after going in from eighty to ninety feet, and, as stated before, when found was supposed to be "black band" iron ore. We have examined the original reports of the assayers, and give the result.

The lands of Mr. Pike are within twenty miles of Gallipolis, by river.

ANOTHER PROSPECTING PARTY.—Last Monday a party of men left this city for the purpose of prospecting in the mountains west of Washos Valley, near what is known as the "Big Slide." Near this place there is supposed to be something very rich in the shape of gold or silver. The Indians say the slide was caused by a heavy earthquake which occurred some years before the first white men made their appearance in the country, which is likely enough. The slide has denuded nearly all of one side of a large and high mountain, and the spot, white and bare, is visible to the distances of many miles. Ever since the settlement of the country by the whites, the notion has existed that somewhere about this slide there must be rich mines of gold or silver, and since 1860 there has been done a good deal of prospecting in that neighborhood. Sometimes this prospecting has been done with a view to the striking of gold in the gravel, and again in the expectation of finding a rich vein of silver in the rock of which the mountain is composed. There have always been stories afloat of good prospects in both metals having been found, but we have observed that none of those who have worked there have ever remained there long, nor have we ever seen either silver or gold brought from that region.—*Enterprise.*

THE LAND MILL.—The Land Mill, in Seven-mile Cañon, is now running on ore from the Chollar mine. They now have stacked up at their mill about 1,500 tons of ore, and more is still being hauled. The roof of the mill, about half of which, with the ventilator or cupola, was burned by a fire which occurred there two or three weeks ago, has been repaired, a new cupola built and all is again as good as new. The fire had such a start that it seems almost a miracle that the mill was not destroyed. On the side of the mountain, north of the mill is a large water tank, from which a string of hose extends to the mill, and but for the good service done by this within, while men were fighting the fire on the outside with buckets, the building must have been destroyed. They now have two strings of hose, can throw two streams of water above the smokestacks of the works and feel quite safe in case the mill should again take fire, as they have a stream for both the interior and exterior.—*National Enterprise.*

The Old Gould & Curry Mill.

While taking a stroll yesterday afternoon along Six and Seven-miles Cañons, we passed the site of this once famous mill, the most costly ever erected in this State, taking into consideration the various works connected therewith. The old mill building is now gone, and even the cut stone foundations on which it once stood have been torn down and removed. The old ore house has also disappeared, and but a heap of rubbish marks the spot where it once stood. The large machine shop, where at one time was manufactured everything from a horseshoe to a steam engine, still stands, but seems now to be used as a barn or cow-house. The large stone building formerly used as a store-house, has been metamorphosed into a splendid dwelling, and, we believe, is now occupied by Mrs. Bowie, of the firm of Park & Bowie, whose fine large tailings mill is situated a short distance further down the cañon. The old boarding-house, on the north side of the cañon, where the hundreds of employes of the once rich and flourishing Gould & Curry Co. were wont to get their daily grub, has been torn down and removed. The heavy walls of cut stone, which in former times supported the fancy terraces at the west end of the mill, have been torn down and the stone hauled away and put to some more profitable use than that of holding up banks of rocks and clay. Even the "duck pond," as was called the large and handsome oval fountain, constructed in the palmy days of the company, by Charles Strong, has not escaped the despoiler. The stone-work round about it has been torn down and removed, and the walls of the basin have been dug up and hauled away. The basin is now dry, and perched aloft on the pipe, through which was once furnished a stream of sparkling water, now stands the iron image of a swan, with head turned appealingly to heaven. The tongue of the bird—in times past sacrilegiously called a "goose"—through which used to spurt a stream of water, is dry enough now, and the paint is gone from its head and hack—worn away probably by the curses of stockholders. The "goose" still hangs high, but he looks exceedingly shabby and dispirited. The hen-house, a large and complicated arrangement, where hens used every morning to lay eggs by steam for the breakfast of the superintendent and other officers, still stands. The old stone spring house is also still standing, but a stovepipe which projects through its octagonal roof shows that it now does duty as the habitation of some honest miner. This is about all that is now to be seen on the spot where but a dozen years since was expended over \$1,000,000.—*Territorial Enterprise.*

Will Mining Pay in Utah?

This is a question now so frequently asked by capitalists and those desirous of investing in mines, that it is worth serious attention. That such an inquiry should be made at all is more or less damaging to our future prospects, and is rather a severe commentary on the past mining history of our Territory, which we must admit has not proved of a satisfactory character to the bona fide investor—the purchaser of stock. On the contrary, the facts of the past have proved most conclusively that, to the bulk of English stockholders in Utah mines, the results are such as to move their disgust, and force them to say most emphatically that mining in Utah does not pay, while the individuals who have placed the mines on the market and have "feathered their nests" in the transaction, are undoubtedly of the opposite opinion.

There can be no doubt that a large proportion of our mining transactions have resulted in injuring the Territory to an alarming degree, in fact to such an extent is this the case, that millions of capital at one time eager for investment here have been diverted into other channels. Take, for instance, the present condition of the Emma stock in London, the mine that gave Utah its reputation and created a world-wide interest in our mineral resources. On Saturday last shares, which had probably cost many a shop-keeper or hard-working mechanic \$20 each, were reported selling at £3, while out of some seven Utah mines in the London market only two, we believe, are above par! It is, therefore, not strange to learn that our prospects for selling mines there are completely ruined for the present.

Who have been mainly benefited by these transactions? Certainly not the Territory for the bulk of the money which has been realized has gone to enrich the speculators and manipulators of the properties, while we are left with such an impaired credit that we are told it is now useless to attempt to sell any more property in London! and all because mines have been stocked for many times their real value, of which the Emma is a notable instance.

Let us look at the other side of the picture. We have a Territory unsurpassed in the world for the extent and richness of its mines, enough to build up a great and powerful State, the proper disposition and utilization of which would open new branches of industry, and fill the Territory with a thrifty and prosperous population. To accomplish this desideratum let capital be invited by placing mines abroad for reasonable sums, instead of inflated and fictitious values, and let more attention be given at home to the economic working of the low-grade ores, of which there are such vast quantities;

and when our mining transactions are reduced from a speculative character to strictly legitimate business, then can the question at the head of this article be answered in the affirmative without fear of contradiction.—*Salt Lake Tribune.*

A Fine Tailings Mill.

The Territorial Enterprise contains the following description of Parke & Bowie's mill: The large tailings mill of Park & Bowie, on Six-mile Cañon, below the old Gould & Curry Mill, is the finest mill for the working of tailings that is to be seen in the State. The person desiring to learn the science of cheaply and rapidly extracting from tailings the precious metals they contain need go no farther for the latest and best information, machinery and processes than this mill. The mill is so built in the cañon that teams laden with tailings may be driven in at one end and out at the other, passing through on the third floor and dumping their loads down to the floor on which stand the amalgamating pans. There are four large pans of one muller each, one pan containing two mullers and one of six. The united capacity of these pans is 150 tons for 24 hours. The pans containing the six mullers is smaller than those containing but one. It is in the shape of a long narrow trough and was constructed for the purpose of experimenting. The small mullers it contains run much more rapidly than do the single mullers in the large round pans. This six-muller pan does excellent work and is considered a great improvement on the old style. The pan with two mullers is also a very fine one and it is a question if it is not equally as good as that containing the six mullers, as after passing the number of two the same principles is only repeated as each new set of two is added; it produces no new action of currents formed in the contents of the pan. Contrary to what would be generally supposed at the first glance, the best effect is produced and the contents of the pan are most thoroughly agitated when the mullers run in the same direction. When the two-muller pan was first started, the mullers were run in opposite directions, and it did but very little better work than the pans of a single muller. It was then changed and both were run in the same direction, when a vast improvement in the rapidity and thoroughness of working was at once observed in the pan. A mechanic who was working at the mill about the time the two-muller pan was built, left and went to San José, California. Being in the "cow counties," where there is more use for churns than amalgamating pans, he set to work and made a churn after the plan of the amalgamating pan he had seen in this State, running his buttermilk mullers in contrary directions. He made several trials of his new churn and was laughed at. It took forty minutes to bring butter with his amalgamating machine. In a fit of desperation he altered his churn so that his mullers ran in the same direction, and lo! it brought butter in five minutes. To explain why this is so would take too long in type. Let any one draw two circles near together, then surround them with arrows, showing the direction in which the wheels are moving, and by observing where the two circles of arrows impinge he will see why it is that the mullers should move in the same direction. All the pans in the mill are the invention of Ira S. Parke, one of the proprietors, and he is not yet done experimenting. There are in the many reservoirs in the cañon tailings sufficient to run both the Railroad and the Express mill for years.

QUARRYING.—A company is busily engaged, says the White Pine News, of the 20th, opening one of the finest sandstone quarries in the State on the Pancoke range of mountains. The stone is of the finest texture, and totally devoid of the presence of lime or iron. Having been successfully tried in various instances, it has proved itself the only trustworthy article in the line of fire-rock. The quarry is situated on the old Sbermantown road, about six miles easterly from the Maryland Wells Station, and is accessible to teams at all seasons. A great demand will be made for this rock in the future, as experience has proved it indispensable to smelting furnaces.

AN IMMENSE ENGINE.—This morning the Virginia Consolidated Mining Company received for their works, from the Virginia and Truckee Railroad, the head piece for an engine weighing 26,700 pounds. There is energy and enterprise in the Virginia Consolidated, and it is to be hoped this big machine, when completed, will aid the company in producing results as big in proportion. *Virginia Chronicle.*

NEW METAL BAND.—For use in collieries, suspension bridges, and for other purposes instead of wire rope, Messrs. Scott, of England, have recently patented a band composed of two or more layers of flat steel, charcoal iron, or other metal, of a suitable thickness and breadth. The layers are each made in one piece and are joined together by brazing, welding, or riveting.

A vein of which is supposed to be oldsidian, has been struck in the west drift of the Reed shaft on the Colorado Central lode. It is from four to eight inches wide, and is quite a mineralogical curiosity.

SMELTING FURNACES are being erected at Tucson. The Patagonian mine is turning out crude bullion to an enormous extent.

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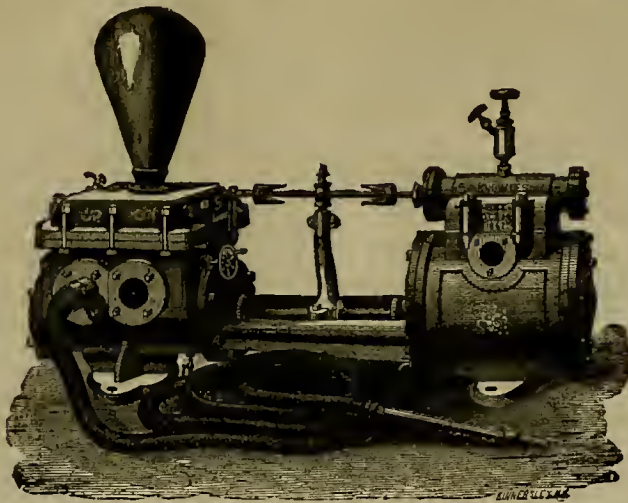
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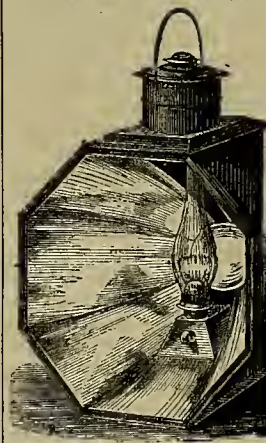
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Prospectors, etc., to our large and well adapted stock of

ASSAYERS' MATERIALS
—AND—
Chemical Apparatus,

Having been engaged in furnishing these supplies since
the first discovery of mines on the Pacific Coast.

Our Gold and Silver Tables, showing the value
per ounce Troy at different degrees of fineness, and val-
uable tables for computation of assays in Graue
Grammes, will be sent free upon application.
7125-4f **JOHN TAYLOR & CO.**

Important to Miners and Mill Men.

Silver-Plated Copper Amalgamating Plates,
for Saving Gold.

Of all sizes and in any quantity, furnished to
order. Full instructions sent for operating.
Particular attention given to plating goods for
Builders, Plumbers, etc. Hotel and Restaurant
work replated.

SAN FRANCISCO GOLD AND SILVER PLATING WORKS,
655 Mission street, San Francisco.
2125-3m **E. G. DENNISTON, Proprietor.**

Varney's Patent Amalgamator.

These Machines Stand Unrivaled.
For rapidly pulverizing and amalgamating ores, they
have no equal. No effort has been, or will be spared
to have them constructed in the most perfect manner
and of the great number now in operation, not one has
ever required repairs. The constant and increasing de-
mand for them is sufficient evidence of their merit.
They are constructed so as to apply steam directly
into the pulp, or with steam bottoms, as desired.

This Amalgamator Operates as Follows.
The pan being filled, the motion of the miller forces
the pulp to the center, where it is drawn down through
the aperture and between the grinding surfaces.—
Thence it is thrown to the periphery into the quicksilver.
The curved plates again draw it to the center, where it
passes down, and to the circumference as before. Thus
it is constantly passing a regular flow between the grind-
ing surfaces and into the quicksilver, until the ore is
reduced to an impalpable powder, and the metal amal-
gamated.

Sellers made on the same principle excel all others.
They bring the pulp so constantly and perfectly in con-
tact with quicksilver, that the particles are rapidly and
completely absorbed.
Mill-men are invited to examine these pans and settlers
for themselves, at the office, 229 Fremont Street,
San Francisco.

Nevada Metallurgical Works.

RIOTTE & LUCKHARDT,
Consulting Mining Engineers and Metal-
lurgists, No. 21 First St., S. F.

WORKING TEST MADE BY ANY PROCESS

TESTING OF PROCESSES.

Plans furnished for the most suitable Process for Ores.

Assaying in all its Branches.

Analysis of Ores, Minerals, Waters and all other sub-
stances.

Special attention paid to the mining and metal-
lurgy of Quicksilver. 26711-6m

PLATINUM

Vessels, Apparatus, Sheet, Wire, Etc., Etc.
For all Laboratory and Manufacturing Purposes
H. M. RAYNOR,
26 Bond street, New York.

Platinum Scrap and Ore purchased. ::

[Continued from Page 357.]

now being continued along the wall of ledge, stripping it for a distance of 20 ft.

WHITE PINE

CHERRY CREEK DISTRICT.—White Pine News, May 31: Cherry Creek is situated on the east-side of the Egan range, about 5 miles north from Egan Canon, which latter place lays nearly north-east from Hamilton, distant about 60 miles. It consists of a series of high ridges, divided by ravines running east into Steptoe Valley, with continuous croppings of quartz cropping northward and southerly, a distance of six or seven miles, from Cherry Creek to Silver Canon. The vein is situated on the Cherry Creek time to be pitching west into the mountains; but, it is held by old miners, that when depth is attained the direction will change to the east, for the reason demonstrated in the Tea-cup ledge, a shaft on which has been sunk a distance of over 90 feet, and found to be gradually turning from its original inclination toward the east. Another evidence of this fact is, that immediately facing the mineral-bearing ledge spoken of, is a formation of quartzite indicating the easterly dip; the west wall being porphyry. The character of the ore, some of which we have seen, is pure, unadulterated quartz, similar in every particular to that of the Comstock.

MOBILE.—This mine, for work has progressed to such an extent as to entitle the claim to that appellation, is situated on Babylon Hill, near Swansea, and has some 800 or 1,000 tons of fine smelting ore on the dump. Some specimens we have seen show evidence of exceeding richness, and contain sufficient quantities of lead to guarantee easy reduction. Situated one-half mile from the mine described is the Great Valley mine, from which 600 or 800 tons of ore has been extracted, much of which was melted at the furnaces erected by Government or Mattison some time ago.

Arizona.

Arizona Miner May 17. Messrs. Pointer, Johnson and Mollen, from Lynx Creek, were in town during the week, all bringing some dust. There is sufficient water for roasting in the creek, and about a dozen men are at work, averaging about \$3.00 per day each.

Messrs. Collier, Hatz and other owners in Goodwin mine are getting out ore which they propose to send to San Francisco.

Several new quartz lodes have been recently discovered between town and Bradshaw, but, as they are no richer than hundreds of others located years ago, the only point gained is that the finder will know where the veins are when the country "comes out," if they live so long.

The ore on the Tiger dump is slowly de-sulphurizing, or de-oxidizing; or decaying somehow, in the sun, and showing under this process more and more silver every day; and water is still running out of the original 110-ft. shaft on the Tiger.

YAVAPAI COUNTY.

Arizona Miner, May 24: Jackson & Co. are still milling and arastrating War Eagle ore, at their place, some 30 miles south from Prescott. The rock is paying.

A new arastra is running on War Eagle ore. It is the property of Messrs. McKinnon and Goodwin.

In Walnut Grove district Messrs. Henry & White are opening the Rainbow lode, with the view of working the ore in an arastra.

In Weaver district, the Marquis and other companies are working ore very successfully. Placer mines are also doing well.

Wickenburg district. Mr. P. W. Smith is running his mill. The mill is conveniently situated on the Hassayampa, about 9 miles below Wickenburg and an equal number of miles from the mine—Vulture—with which it is connected by a good road.

Colorado.

HOMESTEAK MINE, LAKE CO.—Colorado Sentinel, May 22: This celebrated lode was discovered in the summer of 1871. Samples of ore were taken, camp broke, and at right angles to the course of the vein and on a line with a discovery shaft, a cross cut of 35 ft. in length has been driven, striking the lode about 20 ft. from the surface. West from the point of intersection a drift has been run on the vein 70 ft., gaining in depth about 3 1/2 ft. In 12. Eastward from the "cross cut" an "open cut," 10 ft. in depth and 135 in length, has been made. That shows a continuous, heavy body of mineral; from the discovery to the point where the east drift commences this has been driven but 12 ft. on the vein, and no perceptible change has taken place in the ore vein or general appearance of the mine. The ore has paid all the expenses of mining and shipment to Denver and quite a handsome profit besides.

Colorado Miner, May 22: Harry Campbell is taking out 100 ounces ore from the Scotia in good paying quantities. The veins in that locality (Sherman Mountain) are thick and close together that it would be surprising if something good did not come out of them.

The mines in Brown Gulch are turning out some fine ore just now and prospecting in a very encouraging manner. We bear favorable news from the Terrible, Brown, Hercules, Coin, Seven-Thirty, Black and Goss lodes.

Some splendid specimens of brittle silver were struck a few days ago in the very deepest workings of the Pelican, along with a rich body of the ordinary ore that that lode turns out. The Pelican is second to no vein of silver that has yet been found in Colorado.

COLORADO CENTRAL LODES.—The lessees in the Weaver shaft are putting in studs in the east drift. There is a large body of rich ore in sight, varying from 4 inches to 2 ft. in width. From the same shaft an air shaft is being sunk to tap the west level.

Idaho.

LOCAL MINING RECORD.—Owyhee Avalanche, May 31: Work is now going on here in the following incorporated mines: Mohogany, South Chariot, Minnesota, Golden Chariot, Ida Elmore, Red Jacket and War Eagle. Several unincorporated mines are also being worked, among which may be mentioned the Idlewild, Illinois Central and Morning Star.

The Mahogany is looking better than ever, and has about 400 tons of splendid ore ready for milling. It is reported that a rich and extensive body of ore has been recently struck in the Golden Chariot. They are busily engaged in putting the new steam pump into the Ida Elmore.

J. A. Wilson has taken a contract to sink the Rising Star shaft, in Flint District.

The Owyhee mill is running on Minnesota ore. In the creek and gulches placer mining is going on in every direction, although the late cold weather has considerably retarded operations.

ASSAYERS' MATERIALS.—It is with pleasure we call attention to the advertisement of the long established and well known firm of John Taylor & Co., importers of assayers' materials, etc., which will be found in another column. The firm have supplied the trade for a number of years, and knowing the wants fully of the mining companies and assayers on this coast, and importing direct from the manufacturers in Europe and elsewhere, they are able to supply materials in their line at the lowest possible rates.

New Incorporations.

The following companies have filed certificates of incorporation in the County Clerk's Office, S. F.: Cincinnati G. M. Co., May 31: Location, Kelsey Mining District, El Dorado County. Trustees—George A. Gates, Donald Bruce, E. S. Ganz, George B. Hudson and William Small. Capital stock, \$300,000, in shares of \$20 each. The entire capital stock is subscribed.

Utah-Eclipsa M. Co., May 31: Location, Utah Territory. Trustees—W. T. Robinson, Chas. R. Peters, S. W. Lee, James L. King and W. H. Spencer. Capital stock, \$3,000,000, in 30,000 shares of \$100 each, of which \$500,000 has been subscribed.

GOLD MOUNTAIN M. Co., June 3d. Object: to mine for Gold and Silver, and other precious metals, near the town of Lower Ranchina, in Alameda County. Trustees: Wm. Norris, Maurice Dore, S. B. Boswell, Charles H. Dewey, and E. W. Leonard. Capital stock, \$2,400,000, in shares of \$100 each.

THE DEVILS ELBOW FLUME M. Co., has filed its certificate in the office of the Secretary of State, at Sacramento.

THE SAN PABLO R. R. Co., and the Semi-Tropical Water Co., of Los Angeles County, have also filed certificates in Sacramento the latter with a capital of \$30,000. GEORGE LUTHER M. Co.—At a meeting of this company held in Virginia City last week the following officers were elected: Trustees, F. R. Lewis, (President), J. P. Smith, (Vice-Presidents), Martin White and N. K. Lamson. Secretary, L. B. Hastings.

Meetings and Elections.

MAMMOTH S. M. Co., June 3d. Trustees: Robert Sherwood (President), F. G. Berry, S. Linkton, F. A. J. Dine, J. H. Crocker, R. R. Givens and C. A. Kennedy; J. L. King, Secretary.

MINNEAPOLIS M. Co., June 3d. Trustees: William Norris (President), E. Hull, E. B. Pond, J. F. Boyd and O. H. Russell; Wm. Willis, Secretary; F. F. Coffin, Superintendent.

MECHANICA INSTITUTE, June 2d. Trustees: J. C. Patrick, Richard Savage, Charles Elliot, J. H. McDonald, J. P. Curtis, H. W. Jones and P. B. Cornwall.

THE CROWN POINT MINING COMPANY have elected the following Trustees: J. D. Fry, B. Pearl, Robert Sherwood, William Kohl and J. A. Ditcher; C. E. Elliot, Secretary; Samuel L. Jones, Superintendent. The total receipts for the year amounted to \$7,105,699. Dividends amounting to \$2,180,000 were paid, leaving a cash balance on hand, May 1st, of \$1,873,891.

PACIFIC MINERAL LAND OFFICE.—Messrs. Hoyt, Sears and McKee, at rooms 62-4 Merchants' Exchange, make the business of obtaining U. S. patents for mining claims a specialty; and are prepared to give immediate attention to mining cases in California, Nevada, Utah or elsewhere, in the mineral region, and at Washington, D. C., when forwarded for final action.

We understand that these gentlemen are doing an extensive business in their specialty, being well practiced and fully posted in their important work. Also that Mr. McKee, to form his present connection, resigned the position of Chief of the Mining Claims Division, General Land Office, Washington, D. C., which he had occupied for several years.

AN OLD MINE of immense richness is said to have been discovered within two miles of El Paso, Texas, near the line of New Mexico. The vein is said to be about twenty feet wide, and can be traced for miles, sometimes disappearing beneath the surface and again breaking out full and strong. Shafts of over one hundred feet in depth, and other unmistakable evidences of the value of the lode, have been found. Coal, too, has been discovered near the same city, and in inexhaustible quantities. From this it seems that some of the old stories and legends in connection with abandoned mines in New Mexico are a bant to be verified.

WATER POWER IN CHURCH.—The Organist of one of our city churches, has arrived at the conclusion that water power will beat small boy power in pumping the bellows for his organ, and has accordingly discharged the small boy, and employed one of Martin's hydraulic engines to do the work. The engine is arranged to regulate the supply of air, and takes up very little room. It cost \$200, and will entail an expense of \$1 per month. The engine has proven a success, doing its work well.

ASSESSMENT RESCINDED.—The Kentucky Gold and Silver Mining Co. have rescinded the assessment No. 5, of \$4 per share, and on the 2d of June levied a new assessment of \$1.50, delinquent on the 5th of July. Notice is given that any stock upon which the first assessment was paid will be credited with the amount paid upon the last one and the balance refunded.

TEN TONS OF BULLION from the Starr King mine, near Wells Station, C. P. R. R., was received in San Francisco this week. There were 215 bars in the consignment.

MONEY DISTRICT, in Nye county, Nevada, about 100 miles from Pioche, is beginning to look up. A ten-stamp mill is being erected there.

The case of the Eureka Consolidated, vs. the Richmond mine, has been set for another trial, Monday, June 16th.

A GOLD nugget worth \$110, was picked up a few days since at British Creek, Jackson Co., Oregon.

SMOKING TOBACCO.—Miners in all parts of the world smoke more, probably, than the generality of people. When in isolated camps in the winter season they can put up with almost any kind of tobacco; but they are generally pretty good judges of the weed, and want the best when it can be had—a fact that storekeepers in mining camps usually recognize. California tobacco has not, as yet, found much favor among them, as they stick to old and well-known brands for good reasons. Mr. J. D. Hathaway, of 405 Front street, formerly agent on this coast for Gail & Ax, and now agent for the firm of Thomas & Pilkington, of Richmond, Va., recently showed us a number of different brands put up by the latter firm, among which were their celebrated "Fruits and Flowers." One of our editors, who lived in the mines for some time, says that if the storekeepers in the camps had had this brand, they would have sold twice as much tobacco as they did. He has tried numerous brands put up by Thomas & Pilkington, among them "Fruits and Flowers," "Golden Sceptre," "Indispensable," "Planter's Pride," "Bird's Eye," "Commonwealth," "Esmer's Choice," etc., all well known tobaccos, but he prefers the first-mentioned for delicacy of flavor. If people will smoke, they ought to consume nothing but good tobacco, as the injury done is in proportion to the quality: the worse the tobacco the worse the effects. When the brand is well sun-dried, and grown from a fine cultivated weed, as these tobaccos are, deleterious effects are not felt.

THE SAN JUAN COUNTRY.—Many miners are said to be going into the San Juan country, Colorado, notwithstanding the talk of their expulsion from there. A correspondent writing from Del Norte, Colorado, states that every pack animal going in that direction has full loads of prospectors' outfits, with picks, drills, powder, fuse, etc. Some of the prospectors drew twenty days' rations from the military authorities, which does not look like keeping miners out of the country. The men are all in good spirits, and hopeful of a satisfactory solution of the Indian question.

MINING SUTT. E. K. Howes has commenced suit in this city against H. Cox, P. G. Sabatie, E. Worth, A. A. Webber, W. H. Jessup, Andrew Arnold, Stephen Ostrander, O. B. Powers and C. F. Basset, stockholders in the Continental Silver Mining Company, to recover from each his pro rata of his individual liability on a debt of \$1,600, the amount of a promissory note given by the company to the plaintiff.

DIAMOND DISTRICT, in Eastern Nevada, shows encouraging prospects. The Eureka Sentinel says negotiations are being made with parties in this city for the sale of the Champion mine, and a furnace will soon be erected at the mine. Wood and water are plentiful; the district supplies a large proportion of the mining timbers and charcoal used at Eureka.

SOUTHERN UTAH abounds in coal and iron mines which will be developed to some extent this summer, as they are attracting the attention of capitalists.

WORK has been begun on the Clay Street Hill Railroad, and the men have taken up the street between Kearny and Dupont, to lay the wire rope and track.

A DIVIDEND of one per cent. for the month of June will be paid on the 5th inst. by the National Gold Bank and Trust Company, and by the Pioneer Land and Loan Association.

COAL in extensive deposits has been found near Kanarra, Utah, 8 miles from Pioche, and a company will go into the business of converting it into coke for the Pioche market.

THE railroad connecting Coos Bay with Coquille, was commenced on June 1st, and will be completed this summer as far as the Blaine Mountain coal mines.

TRMES are reported to be busy at Belmont, and the mines are looking well.

THE Mint in this city has suspended business until July 1st.

WE WILL CHANGE THE ADDRESS FREE for any subscriber who notifies us in writing of his new address, with the OLD P. O. address to enable us to find his name among thousands of others.

DANIEL WELLINGTON, of Virginia City, Nevada, is requested to communicate immediately with this office.

Try Dr. Evory's Diamond Catarrh Remedy. Only 50 Cents.

Says John to Nance, you look so bright, Your eyes they sparkle, like a star. Oh! yes, says Nance, Dr. Evory's remedy Has cured that horrid, bad catarrh.

OUT OF THE FOG AT LAST.—Dr. Evory has discovered the only SURE cure for Catarrh and Colds. One bottle gives immediate relief, and a few bottles effect a cure. All we ask is a trial. If your druggist don't have it, send to Dr. A. F. Evory & Co., 9 Post street, S. F. It only costs 50 cts. 147-25-2m

THE ONN FELLOWS' BUILDING AT VIRGINIA.—This building noticed at some length by our correspondent "L. P. Mc," in his "Notes of Travel" when in Virginia last, will be completed on the 15th inst. The building is 128 by 45 feet, and four stories high. There is a dancing hall, dressing-room, gallery, kitchen, suites of rooms for offices, library, chess-room, etc. The building will probably cost \$70,000 when completed, and was built by a stock company. It is a very creditable edifice, excelling those usually built in interior towns on this coast. The library is 24x44 feet; there are at present 3,160 books. The Enterprise says that files of the following papers are kept in excellent order in addition to the magazines and books: MINING AND SCIENTIFIC PRESS, San Francisco Bulletin, the Examiner, Sacramento Union, Gold Hill News, Virginia Chronicle and Scientific American and Territorial Enterprise.

THE GRIZZLY.—A dispatch from Salt Lake city says: an injunction has been granted by Judge McKean to the Lavinia mine against the Grizzly Company for sixty days. The Grizzly is considered worth \$300,000. The prospect is bad for the Grizzly.

THE OROVILLE PLACER CLAIMS are said to be turning out well. From five to ten claims chugue hands daily, at prices varying from \$200 to \$2,000. One man in the vicinity sold his vineyard for \$4,500, to be mined.

HOT CREEK DISTRICT, 35 miles from Belmont, and famous in 1867, is now abandoned as a mining camp, the agricultural interests predominating.

Time Tests the Merits of All Things.

1840 For Over 30 Years, 1873

PERRY DAVIS' PAIN-KILLER

Has been tested in every variety of climate, and by almost every nation known to America. It is the constant companion and inestimable friend of the missionary and the traveler, on the sea or land, and no one should travel on our Lakes or Rivers without it.

Since the PAIN-KILLER was first introduced, and met with such extensive sale, many Liniments, Reliefs, Panaceas, and other Remedies have been offered to the public, but not one of them has attained the truly enviable standing of the PAIN-KILLER.

WHY IS THIS SO? It is because DAVIS' PAIN-KILLER is what it claims to be, a Reliever of Pain.

Its Merits are Unsurpassed. If you are suffering from Internal Pain, Twenty to Thirty Drops in a Little Water will almost instantly cure you. There is nothing to equal it for

Colic, Cramps, Spasms, Heart-burn, Diarrhea, Dysentery, Flux, Wind in the Bowels, Sour Stomach, Dyspepsia, Sick Headache, &c., &c.

In sections of the country where Fever and Ague

prevails, there is no remedy held in greater esteem. Persons traveling should keep it by them. A few drops, in water, will prevent sickness or bowel troubles from change of water.

From foreign countries the calls for PAIN-KILLER are great. It is found to

CURE CHOLERA WHEN ALL OTHER REMEDIES FAIL. WHEN USED EXTERNALLY, AS A LINIMENT, nothing gives quicker relief than Burns, Cuts, Bruises, Sprains, Stings from Insects, and Scalds. It removes the fire, and the wound heals like ordinary sores. Those suffering with RHEUMATISM, GOUT, or NEURALGIA, if not a positive cure, they find the Pain-Killer gives them relief when no other remedy will.

It Gives Instant Relief from Aching Teeth.

Every House-keeper should keep it at hand, and apply it on the first attack of any Pain. It will give satisfactory relief, and save hours of suffering.

Do not trifle with yourselves by testing untried remedies. Be sure you call for and get the genuine PAIN-KILLER, as many worthless nostrums are attempted to be sold on the great reputation of this valuable medicine. Directions accompany each bottle.

PRICE—25 cts., 50 cts., and \$1 per bottle.

Mining and Other Companies.

Owing to the time necessary to mail the present large edition of the M. & S. Press, we are obliged to go to press on Thursday evening—which is the very latest hour we can receive advertisements.

Angels Quartz Mining Company—Principal place of business, 408 California street, San Francisco. Location of works: Angels Mining District, Calaveras County, California.

NOTICE.—There are delinquent upon the following described stock, on account of assessment (No. 35), levied March 4th, 1873, the several and respective names of the respective shareholders as follows:

T D Mathewson.....	3	300	\$450 00
T D Mathewson.....	4	314	471 00
T D Mathewson.....	5	500	750 00
T D Mathewson.....	17	26	39 00
T D Mathewson (not issued)		325 57	488 37
J H Fish.....	342 67		574 39
J H Fish, Trustee.....	20	60	75 00
J H Fish, Trustee.....	21	60	75 00
J H Fish, Trustee.....	22	60	75 00
J H Fish, Trustee.....	23	60	75 00
Mrs E B Fish.....	9	1000	1500 00
R M Anthony.....	18	100	150 00
R M Anthony.....	45 57		68 37
R M Anthony.....	19	60	90 00
E H Sawyer.....	11	800	1200 00
E H Sawyer.....	(not issued)	228 47	342 86
Geo. Osgood.....	12	400	600 00
Geo. Osgood.....	(not issued)	114 27	171 43

And in accordance with law and an order made by the Board of Directors, on the 4th day of March, 1873, so many shares of each parcel of such stock as may be

necessary, will be sold at public auction, at the office of Manrice Dore & Co., 327 Montgomery street, San Francisco, Cal., on Monday, April 21st, 1873, at 2 o'clock p. m., of such day, to pay said delinquent assessment thereon, together with costs of advertising and expenses of sale.

GEORGE CONGON, Secretary.

Office, Room No. 1, 408 California Street, San Francisco, California (up stairs). m5-37

POSTPONEMENT.—Angela Quartz Mining Company. The above sale is hereby postponed for thirty days, at the same hour and place.

ap19 GEORGE CONGON, Secretary.

POSTPONEMENT.—Angela Quartz Mining Company. The above sale is hereby postponed until Wednesday, June 18, 1873, at the same hour and place.

m17 GEORGE CONGON, Secretary.

Alpine Gold Mill and Mining Company.—Location of works, Placerville Mining District, Amador County, California. Principal place of business, San Francisco, California.

Notice is hereby given that at a meeting of the Board of Directors of said Company, held on the 18th day of May, 1873, an assessment of \$10.00 per share was levied upon the capital stock of the Corporation, payable immediately, in United States gold coin, to the Secretary, at the office of the Company, No. 438 California Street, San Francisco, Cal. Any stock upon which this assessment shall remain unpaid on the 15th day of June, 1873, will be delinquent, and advertised for sale at public auction, and unless payment is made before, will be sold on the 21st day of July, 1873, to pay the delinquent assessment, together with costs of advertising and expenses of sale. By order of the Directors.

JOEL F. LIGHTNER, Secretary.

Office, No. 438 California Street, San Francisco, California. m13

American Flag Mill and Mining Company.—Location of principal place of business, San Francisco, California. Location of works, Ely District, Lincoln County, Nevada.

Notice is hereby given, that at a meeting of the Board of Directors, held on the 3d day of June, 1873, an assessment of \$1.00 per share was levied upon the capital stock of the Corporation, payable immediately, in United States gold coin, to the Secretary, at the office of the Company, No. 220 California Street, San Francisco, Cal. Any stock upon which this assessment shall remain unpaid on the 15th day of June, 1873, will be delinquent, and advertised for sale at public auction, and unless payment is made before, will be sold on Monday, the 18th day of July, 1873, to pay the delinquent assessment, together with costs of advertising and expenses of sale.

GEORGE R. SPINNEY, Secretary.

Office, No. 220 California Street, Room No. 3, San Francisco, California. m4

California Beet Sugar Company.—Principal place of business, San Francisco. Location of works, Alameda County, California.

Notice is hereby given, that at a meeting of the Board of Directors, held on the 16th day of May, 1873, an assessment of Ten (\$10) Dollars per share was levied upon the capital stock of the Corporation, payable immediately, in United States gold coin, to the Secretary, at the office of the Company, 314 California Street, San Francisco, Cal. Any stock upon which this assessment shall remain unpaid on the 15th day of June, 1873, will be delinquent, and advertised for sale at public auction, and unless payment is made before, will be sold on Tuesday, the 24th day of July, 1873, to pay the delinquent assessment, together with costs of advertising and expenses of sale.

LOUIS FRANCONI, Secretary.

Office, 314 California Street, San Francisco, Cal. m29

Dutch Flat Blue Gravel Mining Company.—Place of business, San Francisco.

Notice is hereby given, that at a meeting of the Directors, held on the 18th day of May, 1873, an assessment of \$2.00 per share was levied upon the capital stock of the Corporation, payable immediately, in United States gold coin, to the Secretary, at the office of the Company, 11, 401 California Street, San Francisco, Cal. Any stock upon which this assessment shall remain unpaid on the 15th day of June, 1873, will be delinquent, and advertised for sale at public auction, and unless payment is made before, will be sold on Monday, the 18th day of July, 1873, to pay the delinquent assessment, together with costs of advertising and expenses of sale.

W. M. HELLMAN, Secretary.

Office, Room 11, 401 California Street, San Francisco, Cal. m16

Equitable Tunnel and Mining Company.—Location of works, Little Cottonwood District, Utah Territory.

Notice is hereby given, that at a meeting of the Board of Directors, held on the 15th day of May, 1873, an assessment of \$1.00 per share was levied upon the capital stock of the Corporation, payable immediately, in United States gold and silver coin, to the Secretary, at the office of the Company, No. 35 New Merchants' Exchange, San Francisco, Cal. Any stock upon which this assessment shall remain unpaid on the 15th day of June, 1873, will be delinquent, and advertised for sale at public auction, and unless payment is made before, will be sold on the 15th day of July, 1873, to pay the delinquent assessment, together with costs of advertising and expenses of sale. By order of the Directors.

CHARLES S. HEALY, Secretary.

Office, No. 35 New Merchants' Exchange, San Francisco, Cal. m2

Hardy Coal Mining Company.—Location of principal place of business, San Francisco, Cal.

Notice is hereby given, that at a meeting of the Board of Directors, held on the 26th day of March, 1873, the several amounts set opposite the names of the respective shareholders are as follows:

Names	No. Certificate.	No. Shares.	Amount.
Warren Goodale.....	37 (old)	94	\$539 30
Edward McLean.....	5	2	52 00
Edward McLean.....	6	41	41 00
Edward McLean.....	16	100	100 00
Edward McLean.....	22	50	50 00
Edward McLean.....	23	60	60 00
Edward McLean.....	24	150	150 00
Edward McLean.....	35	4	2 00
Edward McLean.....	37	46	46 00
O S Kittredge.....	35 (old)	4	60 00
F O Clowrey.....	15	12 1/2	12 00
Jacob Hardy.....	10	100	100 00
Jacob Hardy.....	12	10	10 00
Jacob Hardy.....	21	85	85 00
Jacob Hardy.....	38	8 1/2	8 00
Jacob Hardy.....	40	15	15 00
Jacob Hardy.....	41	2	2 00
Jacob Hardy.....	25 (old)	1	12 50
Jacob Hardy.....	28 (old)	1	12 50
Jacob Hardy.....	39 (old)	23	23 00
H Eastman.....	29	45	45 00
M Eastman.....	29	55	55 00
M Eastman.....	30	50	60 00
Bartlett & Wilcox.....	33 (old)	50	312 50

And in accordance with law, and an order of the Board of Directors, made on the 26th day of March, 1873, so many shares of each parcel of said stock as may be necessary, will be sold at public auction, at the Company's office, Room 5, No. 338 Montgomery Street, San Francisco, Cal., on the 24th day of May, 1873, at the hour of 12 o'clock p. m., of said day, to pay said delinquent assessment thereon, together with costs of advertising and expenses of sale.

JACOB HARDY, Secretary pro tem.

Office, Room 5, No. 338 Montgomery Street, San Francisco, Cal. m13

POSTPONEMENT.—At a meeting of the Board of Directors of the Hardy Coal Mining Company, held Saturday, May 24, 1873, the above sale of delinquent stock was postponed until Saturday, the 7th day of June, 1873, at 12 o'clock p. m. of that day, at the office of the Company, No. 338 Montgomery Street, Room 5, San Francisco, California. All stock on which the assessment is not paid at said time will be sold.

JACOB HARDY, Secretary pro tem.

May 24, 1873.

Frear Stone Company of California.

—Principal place of business and location of works, City and County of San Francisco, State of California. Notice is hereby given, that at a meeting of the Board of Directors, held on the 17th day of May, 1873, an assessment of \$1.00 per share was levied upon the capital stock of the Corporation, payable immediately, in United States gold coin, to the Secretary, at the office of the Company, No. 414 California Street, San Francisco, California. Any stock upon which this assessment shall remain unpaid on the 15th day of June, 1873, will be delinquent, and advertised for sale at public auction, and unless payment is made before, will be sold on Monday, the 21st day of July, 1873, to pay the delinquent assessment, together with costs of advertising and expenses of sale.

R. WEGENER, Secretary.

Office, 4 California Street, San Francisco, Cal. m29

Hasloe Mill and Mining Company.—Location of works, Genoa's Gulch, Mariposa County, Cal.

Notice is hereby given, that at a meeting of the Board of Directors, held on the 14th day of May, 1873, an assessment of \$1.00 per share was levied upon the capital stock of the Corporation, payable immediately, in U. S. gold and silver coin, to the Secretary, at the office of the Company, Room 14, No. 408 California Street, San Francisco, Cal. Any stock upon which this assessment shall remain unpaid on the 15th day of June, 1873, will be delinquent, and advertised for sale at public auction, and unless payment is made before, will be sold on the 21st day of July, 1873, to pay the delinquent assessment, together with costs of advertising and expenses of sale.

J. W. TRIPP, Secretary.

Office, Room 14, No. 408 California Street, San Francisco, Cal. m14

Ida and Rhoda Lewis Consolidated Mining Company.—ANNUAL MEETING.

The annual meeting of stockholders of the Ida and Rhoda Lewis Consolidated Mining Company, for the election of Directors and trustees of such business as may be presented, will be held on Tuesday, June 17th, 1873, at 1 o'clock p. m., at the office of the Company, No. 10 Webb Street, San Francisco, California.

J. DESTA MARINA, President.

A. O. MORSE, Secretary.

San Francisco, May 19, 1873. m19-td

Kincaid Flat Mining Company.—Principal place of business, San Francisco, Cal.

Notice is hereby given, that at a meeting of the Board of Directors, held on the 6th day of May, 1873, an assessment of two dollars per share was levied upon the capital stock of the Corporation, payable immediately, in United States gold and silver coin, to the Secretary, at his office, No. 217 Sansome Street (up stairs), San Francisco, Cal. Any stock upon which this assessment shall remain unpaid on the 15th day of June, 1873, will be delinquent, and advertised for sale at public auction, and unless payment is made before, will be sold on Wednesday, the 24th day of July, 1873, to pay the delinquent assessment, together with costs of advertising and expenses of sale.

R. R. CORNELL, Secretary.

Office, 217 Sansome Street (up stairs) San Francisco, Cal. m7

Mansfield Gold Mining Company.—Principal place of business, San Francisco, California.

Notice is hereby given, that at a meeting of the Board of Directors, held on the 8th day of May, 1873, an assessment of five cents per share was levied upon the capital stock of the Corporation, payable immediately, in United States gold and silver coin, to the Secretary, at the office of the Company, No. 31 Kearny Street, San Francisco, Cal. Any stock upon which this assessment shall remain unpaid on the 15th day of June, 1873, will be delinquent, and advertised for sale at public auction, and unless payment is made before, will be sold on Tuesday, the 18th day of July, 1873, to pay the delinquent assessment, together with costs of advertising and expenses of sale.

WM. SMALL, Secretary.

Office, No. 31 Kearny Street, San Francisco, Cal. m15

Office Newton Booth Consolidated Mining Company.—NOTICE TO STOCKHOLDERS.

Notice is hereby given, that at a meeting of the Board of Directors, held on the 10th day of February, 1873, an assessment of 25 cents per share on the capital stock of the Newton Booth Consolidated Mining Company, payable immediately, in United States gold and silver coin, to the Secretary, at the office of the Company, No. 31 Kearny Street, San Francisco, Cal. Any stock upon which this assessment shall remain unpaid on the 15th day of June, 1873, will be delinquent, and advertised for sale at public auction, and unless payment is made before, will be sold on the 15th day of July, 1873, to pay the delinquent assessment, together with costs of advertising and expenses of sale.

LOUIS FRANCONI, Secretary.

San Francisco, May 11th, 1873.

Newton Booth Consolidated Mining Company.—Location of principal place of business, San Francisco, California.

Notice is hereby given, that at a meeting of the Directors, held on the 17th day of May, 1873, an assessment of fifty cents per share was levied upon the capital stock of the Corporation, payable immediately, in United States gold coin, to the Secretary, at his office, No. 314 California Street, San Francisco, Cal. Any stock upon which this assessment shall remain unpaid on the 14th day of June, 1873, will be delinquent, and advertised for sale at public auction, and unless payment is made before, will be sold on the 21st day of July, 1873, to pay the delinquent assessment, together with costs of advertising and expenses of sale.

LOUIS FRANCONI, Secretary.

Office, No. 314 California Street, San Francisco, California. m16

Mazepa Silver Mining Company.—Location of works, Ely District, Lincoln County, Nevada.

Notice is hereby given, that at a meeting of the Directors, held on the 26th day of May, 1873, an assessment of \$1.00 per share was levied upon the capital stock of the Corporation, payable immediately, in United States gold coin, to the Secretary, at the office of the Company, No. 329 Sansome Street, San Francisco, Cal. Any stock upon which this assessment shall remain unpaid on the 15th day of June, 1873, will be delinquent, and advertised for sale at public auction, and unless payment is made before, will be sold on Tuesday, the 18th day of July, 1873, to pay the delinquent assessment, together with costs of advertising and expenses of sale.

M. F. GAME, Secretary.

Office, No. 329 Sansome Street, San Francisco, Cal. m26

Omega Table Mountain Mining Company.—Location of works, Tuolumne County, California.

Notice is hereby given, that at a meeting of the Board of Directors, held on the 4th day of June, 1873, an assessment of \$1.00 per share was levied upon the capital stock of the Corporation, payable immediately, in United States gold and silver coin, to the Secretary, at the office of the Company, No. 314 California Street, San Francisco, Cal. Any stock upon which this assessment shall remain unpaid on the 15th day of July, 1873, will be delinquent, and advertised for sale at public auction, and unless payment is made before, will be sold on the 21st day of August, 1873, to pay the delinquent assessment, together with costs of advertising and expenses of sale.

DAVID WILDER, Secretary.

Office, No. 23 Merchants' Exchange, California Street, San Francisco, California. m5-4v

Office of the Providence G. and S. Mining Company.—Location of works, Nevada County, California.

Notice is hereby given, that at a meeting of the Board of Directors, held on the 10th day of April, 1873, an assessment of ten cents per share was levied upon the capital stock of the Corporation, payable immediately, in United States gold coin, to the Secretary, at the office of the Company, No. 314 California Street, San Francisco, Cal. Any stock upon which this assessment shall remain unpaid on the 15th day of June, 1873, will be delinquent, and advertised for sale at public auction, and unless payment is made before, will be sold on the 21st day of July, 1873, to pay the delinquent assessment, together with costs of advertising and expenses of sale.

J. M. BUFFINGTON, Secretary.

San Francisco, May 29, 1873. m21-td

Schell Creek Mining Company.—Location of principal place of business, No. 204 California Street, San Francisco, State of California.

Notice is hereby given, that at a meeting of the Board of Directors, held on the 10th day of April, 1873, an assessment of ten cents per share was levied upon the capital stock of the Corporation, payable immediately, in United States gold coin, to the Secretary, at the office of the Company, No. 204 California Street, San Francisco, Cal. Any stock upon which this assessment shall remain unpaid on the 15th day of June, 1873, will be delinquent, and advertised for sale at public auction, and unless payment is made before, will be sold on the 21st day of July, 1873, to pay the delinquent assessment, together with costs of advertising and expenses of sale.

H. B. LONGDON, Secretary.

Office, 204 Montgomery Street, San Francisco, Cal. m29

No. 304 California Street, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the 14th day of May, 1873, will be delinquent, and advertised for sale at public auction, and unless payment is made before, will be sold on Monday, the 21st day of June, 1873, to pay the delinquent assessment, together with costs of advertising and expenses of sale.

P. W. VAN WINKLE, Secretary.

Office, No. 304 California Street, San Francisco, Cal. m15

POSTPONEMENT.—The day for deciding shares delinquent on the above assessment is hereby postponed until Saturday, the 24th day of May, 1873, and the sale thereof until Monday, the 16th day of June, 1873. By order of the Board of Directors.

P. W. VAN WINKLE, Secretary.

POSTPONEMENT.—The day for deciding shares delinquent on the above assessment is hereby postponed until Saturday, the 7th day of June, 1873, and the sale thereof until Monday, the 30th day of June, 1873. By order of the Board of Directors.

P. W. VAN WINKLE, Secretary.

Rising Star Mining Company.—Location of principal place of business, San Francisco, California.

Notice is hereby given, that at a meeting of the Board of Directors, held on the 25th day of April, 1873, the several amounts set opposite the names of the respective shareholders are as follows:

Names.	No. Certificate.	No. Shares.	Amount.
E B Barnes.....	1075	25	\$ 5 00
E B Barnes.....	358	100	1 50
J M Bullington, Trustee.....	60	100	6 00
J M Bullington, Trustee.....	59	100	6 00
J M Bullington, Trustee.....	61	100	6 00
J M Bullington, Trustee.....	64	100	6 00
J M Bullington, Trustee.....	65	100	6 00
J M Bullington, Trustee.....	66	100	6 00
J M Bullington, Trustee.....	67	100	6 00
J M Bullington, Trustee.....	69	100	6 00
J M Bullington, Trustee.....	144	69	4 14
J M Bullington, Trustee.....	373	100	6 00
J M Bullington, Trustee.....	375	100	8 00
J M Bullington, Trustee.....	382	100	6 00
J M Bullington, Trustee.....	383	100	6 00
J M Bullington, Trustee.....	401	100	6 00
J M Bullington, Trustee.....	413	331	19 86
J M Bullington, Trustee.....	419	25	1 50
J M Bullington, Trustee.....	420	25	1 50
J M Bullington, Trustee.....	421	25	1 50
O Brown.....	116	25	1 50
O Brown.....	117	25	1 50
O Brown.....	118	25	1 50
O Brown.....	119	25	1 50
O Brown.....	120	25	1 50
O Brown.....	121	25	1 50
O Brown.....	122	25	1 50
O Brown.....	123	25	1 50
O Brown.....	124	25	1 50
O Brown.....	125	25	1 50
O Brown.....	126	25	1 50
O Brown.....	127	25	1 50
O Brown.....	128	25	1 50
O Brown.....	129	21	1 25
O Brown.....	129	21	1 25
O Brown.....	395	60	3 00
O Brown.....	396	60	3 00
O Brown.....	397	60	3 00
W Bryan.....	152	1	1 25
H B Berryman.....	186	100	6 00
H B Berryman.....	188	100	6 00
H B Berryman.....	189	31	1 86
H B Berryman.....	190	31	1 86
H B Berryman.....	355	60	3 00
H B Berryman.....	356	60	3 00
M Benson.....	394	60	3 00
Jacob Brown.....	414	25	1 50
Frank Clayton, Trustee.....	423	331	19 86
Frank Clayton, Trustee.....	427	662	37 72
W J Gunn.....	398	70	4 20
N B Green.....	33	200	12 00
N B Green.....	34	100	6 00
N B Green.....	35	31	1 86
N B Green.....	36	31	1 86
R W Gunn, Trustee.....	365	60	3 00
R W Gunn, Trustee.....	366	60	3 00
R W Gunn, Trustee.....	367	60	3 00
O Hutchinson.....	417	25	1 50
S T Kennedy.....	157	100	6 00
S T Kennedy.....	158	100	6 00
S T Kennedy.....	159	85 1/2	6 20
P Newman.....	193	60	3 00
P Newman.....	195	60	3 00
P Newman.....	196	50	3 00
S Nathan, Trustee.....	424	331	19 86
A Rosenfield.....	32	24	1 44
A Rosenfield.....	298	1000	60 00
A Rosenfield.....	299	100	6 00
Rosenbaum.....	177	331	19 86
Daniel Sheehan.....	414	50	3 00
O Wukeman.....	418	25	1 50

And in accordance with law, and an order of the Board of Directors, made on the 25th day of April, 1873, so many shares of each parcel of said stock as may be necessary, will be sold at public auction, at the office of the Company, room 37 New Merchants' Exchange, California Street, San Francisco, Cal., on Monday, the 16th day of June, 1873, at the hour of 12 o'clock p. m., of said day, to pay said delinquent assessment thereon, together with costs of advertising and expenses of sale.

J. M. BUFFINGTON, Secretary.

Office, 37 New Merchants' Exchange, California Street, San Francisco, California. m29

Regent Consolidated Mining Company.—Principal place of business, San Francisco, California.

Notice is hereby given, that at a meeting of the Board of Directors, held on the 26th day of May, 1873, an assessment of ten cents per share was levied upon the capital stock of the Corporation, payable immediately, in United States gold coin, to the Secretary, at the office of the Company, No. 338 Montgomery Street, San Francisco, Cal. Any stock upon which this assessment shall remain unpaid on the 15th day of June, 1873, will be delinquent, and advertised for sale at public auction, and unless payment is made before, will be sold on Tuesday, the 18th day of July, 1873, to pay the delinquent assessment, together with costs of advertising and expenses of sale.

WM. L. USTICK, Secretary.

Office, 438 California Street, San Francisco, California. m27

Silver Sprout Mining Company.—Principal place of business, San Francisco, State of California.

Notice is hereby given, that at a meeting of the Board of Directors, held on the 30th day of June, 1873, an assessment of Three Cents per share was levied upon the capital stock of the Corporation, payable immediately, in United States gold coin, to the Secretary, at the office of the Company, No. 314 California Street, San Francisco, Cal. Any stock upon which this assessment shall remain unpaid on the 15th day of July, 1873, will be delinquent, and advertised for sale at public auction, and unless payment is made before, will be sold on Monday, the 21st day of August, 1873, to pay the delinquent assessment, together with costs of advertising and expenses of sale.

Office, Room No. 13, No. 315 California Street, San Francisco, California. m4

State of Maine Mill and Mining Company.—Principal place of business, San Francisco, Cal.

Notice is hereby given, that at a meeting of the Board of Directors, held on the 23rd day of May, 1873, an assessment of \$1.00 per share was levied upon the capital stock of the Corporation, payable immediately, in United States gold and silver coin, to the Secretary, at the office of the Company, No. 314 California Street, San Francisco, Cal. Any stock upon which this assessment shall remain unpaid on the 24th day of July, 1873, will be delinquent, and advertised for sale at public auction, and unless payment is made before, will be sold on Monday, the 21st day of July, 1873, to pay the delinquent assessment, together with costs of advertising and expenses of sale.

H. B. LONGDON, Secretary.

Office, 205 Montgomery Street, San Francisco, Cal. m29

The Sanderson Gold Mining Company.

Location of works, Railroad Flat, Calaveras County, California. Principal place of business, San Francisco, Cal.

Notice is hereby given, that at a meeting of the Board of Directors, held on the 4th day of May, 1873, the several amounts set opposite the names of the respective shareholders are as follows:

Names.	No. Certificate.	No. Shares.	Amount.
Frank Clayton, Trustee.....	33	1500	\$187 50
David Bole.....	35	400	50 00
A Rosenfield.....	36	200	25 00
A Rosenfield.....	36	600	62 50
E A Donnicke.....	49	2000	250 00
Jules Greenhood.....	51	400	60 00

And in accordance with law, and an order duly made by the Board of Directors, so many shares of each parcel of such stock as may be necessary, will be sold at public auction, at the office of the Company, 113 Leidesdorff Street, San Francisco, on Thursday, the 19th day of June, 1873, at the hour of 1 o'clock p. m. of said day, to pay said delinquent assessment thereon, together with costs of advertising and expenses of sale.

WILLIAM STUART, Secretary.

Office, 113 Leidesdorff Street, San Francisco, Cal. m5

Table Mountain Alpha Mining Company.—Location of principal place of business, No. 438 California Street, San Francisco, California.

Location of works: Table Mountain District, Tuolumne County, California.

Notice is hereby given, that at a meeting of the Board of Directors, held on the 30th day of February, 1873, the several amounts set opposite the names of the respective shareholders are as follows:

E L R Watt.....	24	300	75 00
E L R Watt.....	25	100	25 00
E L R Watt.....	28	100	25 00
W N Harris.....	3	2000	500 00
W N Harris.....	38	902	225 50
T H Holt.....	7	5	1 25
T H Holt.....	22	1540	397 50
T H Holt.....	40	901	226 25
S Solomons.....	9	6	1 25
S Solomons.....	15	1495	373 75
S Solomons.....	20	840	210 00
Algernon Smith.....	11	500	125 00
Algernon Smith.....	44	226	56 50
B Marks.....	33	100	25 00
B Marks.....	18	1500	375 00
B Marks.....	36	430	112 50
B Marks.....	41	901	225 25
J W Roberts.....	13	500	125 00
J W Roberts.....	14	500	125 00
E A Richardson, Trustee.....	35	450	112 50
E A Richardson, Trustee.....	43	226	56 50
E A Richardson, Trustee.....	45	140	35 00
E A Richardson, Trustee.....	46	200	50 00
E A Richardson, Trustee.....	47	100	25 00
E A Richardson, Trustee.....	48	100	25 00
G W Bowie.....	17	200	50 00
J Jacobs.....	18	5	1 25
Wm Fisher.....	19	100	25 00
Lucinda Foreman.....	20	100	25 00
P H Cannavan.....	21	200	60 00
John Ashton.....	27	500	125 00
John Ashton.....	28	300	75 00
John Ashton.....	29	100	25 00
John Ashton.....	30	25	6 25
E Watt.....	39	902	225 50

And in accordance with law, and an order of the Board of Directors, made on the 3d day of February, 1873, as many shares of each parcel of such stock as may be necessary, will be sold at public auction, at the office of the County Clerk, No 1 California street, San Francisco, California, on Wednesday, the 2d day of April, 1873, at the hour of 12 o'clock m., of such day, to pay delinquent assessments thereon, together with costs of said

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WM. H. TAYLOR.....President
JOSEPH MOORE.....Vice-President and Superintendent
LEWIS E. MEAD.....Secretary
24v17-47

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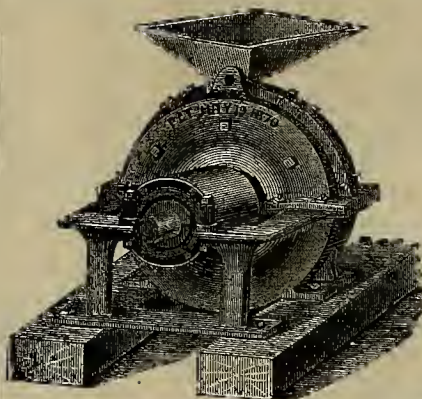
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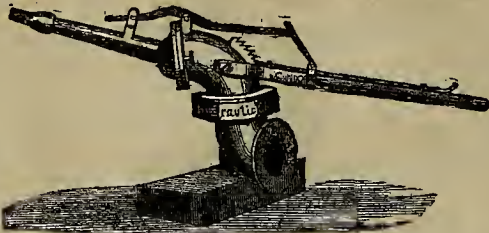
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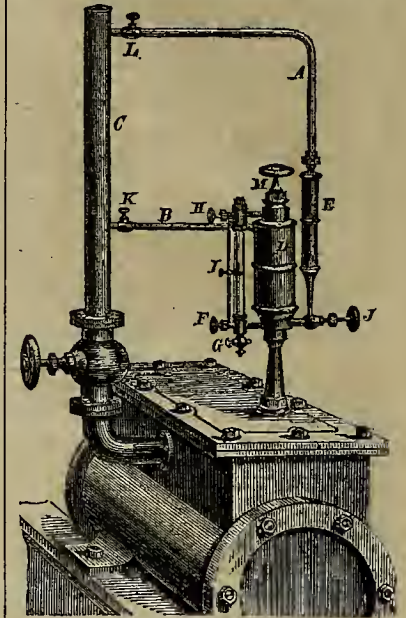
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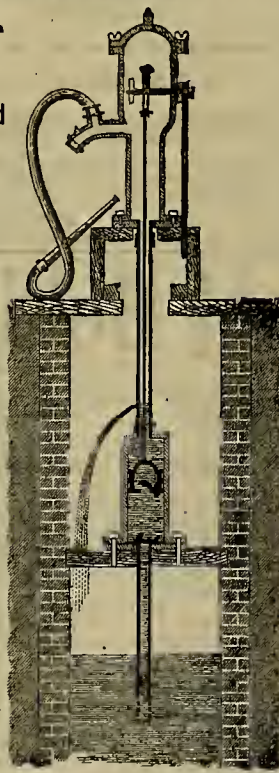
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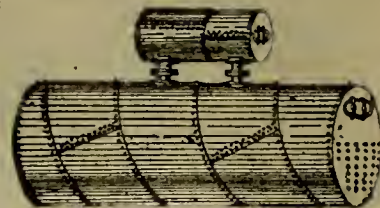
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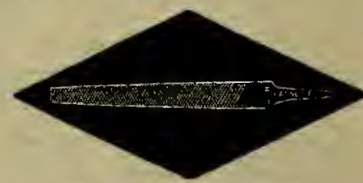
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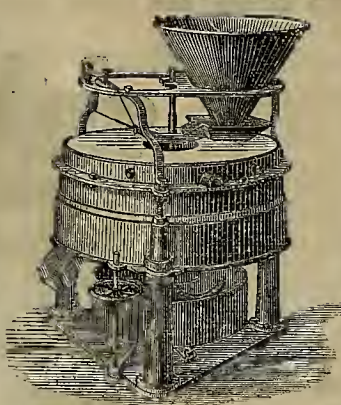
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Number 24.

The Electro-Galvanic Quicksilver-Saving Apparatus.

Quicksilver-saving appliances in mining operations seem to be one of the necessities of the age. In the early history of mining on this Coast, little care was taken to prevent waste of quicksilver, or even the precious metals; but now-a-days, when economy is necessary, and the immense waste without careful manipulation is known, numerous appliances having this object in view are in use. Among the latest improvements is one recently patented through the agency connected with this office, which is the invention of Joseph Potts, of Treasure Hill, White Pine, Nevada. The apparatus is made especially to save the quicksilver and amalgam which usually escapes down the sluices on account of its fineness or subdivision. The method of accomplishing this, as will be seen, is by passing the tailings, or pulp through a sluice-box or section of a sluice, which is provided, with peculiarly-arranged riffles, the pulp being first distributed upon the floor of the sluice by means of a revolving hopper, of novel construction. Figure 1, of the accompanying engravings, represent a perspective view of the machine, and Figure 2 is an end view.

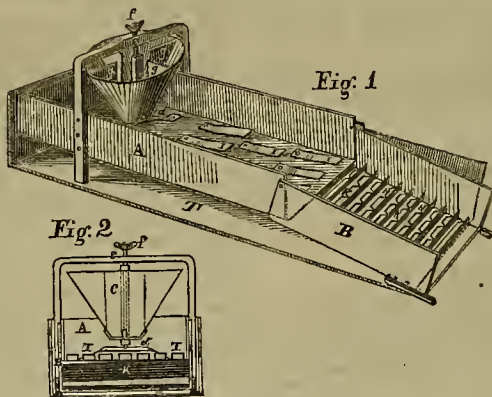
A represents a copper box, one end of which is open. Secured to the other end of this box is a short section, B, of a sluice, which descends at an angle from the sluice, as shown. This section is riveted to the box, A, so that one side will be one inch, and the other side one inch and a-half lower than the bottom of the box. The opposite end of the box is properly enpointed, in order to level its bottom; or, if desired, a very slight inclination toward the open end can be given to it. Inside of the box, A, near its closed end, is mounted a conical hopper, C, by means of a vertical shaft, the lower end of which steps in the center of an arched copper plate, D, the ends of which are secured to the bottom of the box. The upper end of this shaft is supported in a transverse copper beam, E, which passes above the box, and which may be a simple frame, the ends turned down and fastened as shown. A set screw, F, serves as a bearing for the upper end of the shaft. The hopper itself is made of copper, and is provided with radial copper flanges, G, G, which are widest at the upper end, and gradually taper to the lower opening of the hopper. Along the bottom of the box, A, are placed ten rows of copper riffles, I, I, I. Each riffle is riveted to the bottom of the box at an angle of about 30° from the horizontal plane, and extends lengthwise to the box, as shown. A space of about one inch is left between the riffles in each row. The riffles in each alternate row are riveted between the spaces of the upper row, so that there are five rows containing five of the riffles, and five rows containing four.

Upon the bottom of the section, B, are riveted a series of riffles, K, K, which are also made of copper plate. These, however, run across the width of the box, and are set at the same inclination as the box itself, so that they, too, are one and a-half inches in height at one side and one inch at the other. At the higher side these riffles are perforated at N, N, so as to allow the quicksilver and soft amalgam (which by gravitation would naturally fall to this side), to pass through and finally run into the vessel for receiving it. The lowest of these riffles is not perforated, and the main quantity of water and sand is allowed to pass over it into the sluice below. The interior of these

copper boxes, as well as the riffles and the revolving hopper, are all well coated with amalgam and quicksilver. These copper boxes are enclosed in another of zinc plate T; thus in the admission of any tailings or water, however slightly acidulated, a galvanic action is set up. For better protection of these covers the whole may be inclosed in a stout wooden box and kept under lock and key.

This apparatus is so placed as to receive the tailings at the upper end in the revolving hopper, C. The tailings are thus distributed along the course of the riffles and finally discharged from the sluice. In passing through these boxes and over the riffles, the tailings are subjected to galvanic action, which favors the amalgamation of the particles.

ASTRONOMICAL.—Jupiter still remains, as it has been for several months, quite a conspicuous object in the evening sky. It may be seen among the stars of Leo, and sets about mid-



POTTS' QUICKSILVER-SAVING APPARATUS.

night. There will be nineteen eclipses of the satellites of this planet during the month of June—a less number, however, than usually occurs within the space of a month.

Mars is also quite conspicuous. It may now be seen at the meridian about 10 P. M.

Venus, which ceased last month to be the evening star, is now at its period of greatest brilliancy, and is as conspicuous as the morning star. It may be seen by the naked eye about 9 in the morning at an altitude of about 60 degrees.

Saturn rises about 10 P. M., and sets about 5 A. M., and consequently it is now above the horizon only about seven hours.

AN UNLUCKY ACCIDENT.—The aquarum car, with its load of live fish and fish-eggs, to be deposited in the waters of California rivers, did not succeed in getting through safely. The locomotive and this one car were precipitated from a trestle work at the Elkhorn River bridge, about twenty-five miles from Omaha, and the whole consignment of fish were lost in the river. There were about 30,000 live fish, including several thousand Eastern trout; the rest being bass, perch, cat-fish, eels, shad, lobsters, etc. Another attempt will be made to bring a consignment of fish to this coast, which it is hoped will be successful.

HEAVY BULLION SHIPMENTS.—Wells, Fargo & Co. shipped from Virginia City, Nev., during the month of May, in silver bars, the sum of \$2,987,856.72, within about \$12,000 of \$3,000,000. This is the largest amount of bullion ever shipped from that office during the same period. The *Enterprise* says it tells its own story of the present condition of the mines.

Patera's Quicksilver Furnace.

Mr. Kustel writes us from Vienna that Mr. V. Patera has made an experiment with his patent quicksilver furnace, on the plan of a muffle furnace. The quicksilver ore must be pulverized for this process, but Patera thinks that the cost of crushing is insignificant compared with the value of the higher percentage of quicksilver obtained by his process. The officers at Idria admit a loss of 37 per cent. as compared with their usual assay, but the usual assay by retorting compared with the analysis shows a heavy loss besides. The analysis of a series of samples compared with the retort assay gave in average the following results:

Idria assays, 3.94 per cent. Analysis of the same, 5.00 per cent.

This shows 12 per cent. loss by the assay, and with the above loss of 37 per cent. it would amount to 49 per cent. real loss. Mr. Patera claims to work the ore up to 84 per cent. of the

Pacific Coast Marine Work.

The steamer "Oliver Walcott," the first Revenue Cutter built on the Pacific Coast, has just made her official trial trip of 24 hours at sea. The dimensions of this vessel are: length over all, 137 feet; breadth of beam, 22 feet; depth of hold, 10 feet 4 inches. The contractors with the Government for the steamer are the Risdon Iron and Locomotive Works, the hull being built for them by Dickie Brothers.

The machinery consists of one surface-condensing inverted directing engine, with a diameter of cylinder of 34 inches, and 34 inches length of stroke. The condenser has a covering surface of 820 square feet. The boiler is of the ordinary flue, and return tubular type provided with a steam chimney, and with semi-circular legs to fire-box. There are two furnaces with 52 square feet of grate surface, the total heating or fire surface being 1,568 square feet. The whole machinery is strong, durable and well finished, and really a credit to the Works. It operates smoothly and presents a neat appearance. Before proceeding on the trial trip proper a few hours were spent on the bay in smooth water for the benefit of the friends of the contractors, who had conscientious scruples about going "outside." The builders provided an excellent lunch for their guests, and the whole trip was an enjoyable one to all present. The landsmen were put ashore at 12 o'clock, and at half-past one the "Oliver Walcott" proceeded to sea, clearing the heads at ten minutes past two.

Courses were laid off on the charts in about 30 mile stretches in order to test the vessel in every relative position to the sea and wind, of which there was quite enough to make the test of some value. Any one who has been over the bar and out towards the Farallone Islands on one of our breezy, summer afternoons (and this is a particular breezy month) will recognize the fact that a pretty severe test can be given to a small vessel. During the whole 24 hours the vessel and engine behaved splendidly. The average revolutions for the time was 63, and the whole distance run was 238 knots. A test of speed was made while running up the bay in smooth water by Walker's Patent Log, which was found to correspond with the distance run during the trial outside. This gave a speed of 11½ knots, while speed at sea was nearly 10 knots. The trial was in every way satisfactory both to the contractors and the representatives of the Government. Captain White and Mr. Wason represented the Revenue Department and Mr. Dickie the builders.

A difficulty attendant upon the building of this, the first vessel for the Government, lay in the fact that specifications were made in the east, and comprehended the use of eastern woods, to a large extent. Peculiarities of the fitting of windows, doors, etc., not necessary in our climate, were specified, and several attendant details which necessitated the importation of special articles from the east. This will probably be avoided in other cases, as the engineers on this coast will suggest a change in items of minor importance. The builders have, however, turned out a very neat, substantial, and tasty job. The joiner work is well done, and the finish, though not elaborate, is handsome and attractive. Patent steering gear is employed, and a windlass and capstan combined is on board. There are two cabins, with the usual staterooms, pantry, etc. The only houses on deck are the pilot-house, chart room, and cover for the machinery. The vessel has a particularly beautiful and graceful sheer, which any nautical man would notice.

She is rigged to carry two stay-sails, spanker, jib and square-sail. The builders, who recently built the "Eastport," another small steamer, have made such an excellent job of this one that it is to be hoped that this impetus to ship-building on the Pacific will not stop here, but they will in future have their hands full. The speed attained by this little propeller in a seaway is a sufficient guarantee of the skill exercised in modeling her, and of the smoothness and strength of her machinery. In a vessel as small as she is, it is quite remarkable, taking into consideration the fact, that the machinery was new and the water pretty rough.

QUICKSILVER has been found by the locator of the Pope Valley mine, on the O'Farrell Ranch, Bodega, Sonoma county.

CORRESPONDENCE.

A Rambler's Notes in Sierra County.

Forest City was years ago a flourishing town, from the time of the discovery of the famous "blue gravel" lead. It was struck by miners in working up the bed of the creek. The city ranked well up amongst the best mining camps in the county. As the "blue gravel" was being slowly worked out, and no new developments made, the miners left, until the place two years ago, voted only 60 odd, instead of 700 as formerly. When the "Bald Mountain Co." was organized, and went to work with a will, it soon struck as good, if not better, pay than was first found; as an evidence of the success of the company, their expenses up to the present time, in tunnels, timbers, right of way, and over 1 mile of flumes, has been \$100,000, all of which has been paid off, and \$44,000 divided amongst the stockholders. The main tunnel is in 2,500 ft., breasting out 250 to 300 ft. wide, the present faces showing equally as good, if not better gravel, than any taken out. The work under Superintendent Wallace, is being done in a substantial manner, the owners as well may wear smiling faces and talk of hundreds of thousands for the claim. This ground is extensive.

The North Fork Co., are pushing ahead their tunnel now in 2,200 ft., and expect soon to be taking out good pay grit. They join the Bald Mountain on the north and have acres of ground.

The South Fork Company adjoining the Bald Mountain Co., on the south, have organized and let a contract for a tunnel, and will push the work to completion. They expect to strike the ground deposit inside of 2,000 feet. And have a large claim.

Again to the East of the Bald Mountain Co., on the Rock Creek Side, another Co. are preparing to open up their ground by shafting. Upon the whole the present prospects of Forest City looks to surpassing her former greatness. Her business men with an eye to an increased demand are in full supply of goods.

Mr. Ellery of the City Hotel, having moved back the old building, is now erecting a large two-story front. This is a necessity from the increasing demand for hotel accommodations.

Crossing the Ridge to the South, two miles brings you to old Alleghany, quietly resting upon her former laurels. Mr. Briggs, Superintendent of the Highland & Masonic Co. owned by Manson & Co., informs you that they are at present opening the ground by tunneling, formerly worked through a shaft. Too much water forced an abandonment and when the ground was drained, good pay gravel was left, which he expects to strike soon, when you may hear of good dividends from the old Highland & Masonic. One-half mile below town, at Smith's Flat, one Co. is operating in a small way, with favorable prospects. In full view, but across the Creek, (Kanaka) is Chipp's Flat, where very little is doing. Two miles further South is Minnesota, at present, quiet.

RAMBLER.

Borax.

History of its Discovery—Experiments—Mode of Occurrence—Extraction—Assay, Etc.

[Written for the Press by HENRY G. HANES.]

The early history of borax is vague and uncertain. Some writers assert that it was known to the ancients, a statement flatly denied by others. One author quotes from the writing of Suetonius, who lived in the first century, "That the circus in his time was covered with borax and vermillion."

Several writers maintain that the "Chrysocola" (literally gold glue) of the ancients was borax. Chaptal, without giving his authority, says that Chrysocola was an artificial solder, of which oxide of copper was the base. A substance is described by Pliny, under the name of "melites lapis," which is supposed by the translator to have been borax.

The name "Borax" appears in the works of Geber, an Arabian alchemist, who lived in the ninth century. According to Webster, the word is of Arabic origin, and is derived from *buraka* "to shine."

Very Little was Known

Of the properties of borax until the year 1702, when Homberg, a Dutch chemist, discovered boracic acid, which he produced by subliming a mixture of sulphate of iron and borax; the sublimate so obtained was called "Homberg's Sedative Salt" and "Narcotic Salt," which was used as a remedy for fevers. In the old chemical books the term "Sedative Salt" and "Acid of Borax" are of frequent occurrence.

In 1729 Lemery produced boracic acid in the manner still common among chemists, by decomposing borax with a stronger acid.

Geoffroy, in the year 1731, observed that boracic acid imparted a green flame to burning alcohol. This characteristic reaction is still in use, and enables modern chemists to distinguish boracic acid from all others.

In 1752, Baron announced that borax was a

compound of sedative salt and soda. Shortly after this discovery, sedative salt being found to possess acid properties, was for the first time called "Boracic Acid."

The Thibet localities of borax were discovered in 1772, or at least samples of native borax were sent to Sweden by Mr. Grill Abrahamson in that year, which is probably the first authentic discovery of natural borax on record. Shortly afterward, Hoefsr found

Boracic Acid

In lakes of hot mineral waters in Tuscany.

For fifty years after Baron's discovery, the element which is the base of boracic acid remained unknown; Crell nearly discovered it in 1800, when he published a statement that boracic acid was the oxide of a substance resembling carbon.

Davy repeated Crell's experiments, but without obtaining the same results. In 1807, he submitted boracic acid to the action of a powerful galvanic battery, and obtained a black substance at the negative pole.

To Guy Lussac and Thenard belong the honor of first isolating the element

Boron.

Which is now known to be the base of boracic acid. The decomposition was made by fusing potassium with boracic acid in a copper tube.

Modern chemists have added much to our knowledge of boron and its compounds. Until the invention of the oxyhydrogen blowpipe, many substances were assumed to be infusible which now yield to its powerful action.

In 1837 Gardin fused salina into crystals resembling rubies and other precious stones, of which alumina is the base. In 1847 Ebelmen, the manager of a Sevres porcelain factory noticed that boracic acid sometimes volatilized in his furnaces. He commenced experimenting with boracic acid and alumina which resulted in his obtaining shining crystals of extreme hardness which he supposed to be oxide of alumina, but which were probably boron.

It is well known that carbon assumes three forms or conditions which are "graphite," "charcoal" and the "diamond," or, as it would be expressed scientifically, *Graphitoid, Amorphous and Adamantine*. Wohler and Deville have made elaborate experiments on boron, and have found that it likewise exists in three forms like carbon, to which it exactly corresponds. Graphitoid boron is obtained by subjecting a mixture of fluoroborate of potassium with alumina to a high temperature. The amorphous form is prepared by strongly heating boracic acid with a small quantity of alumina, and boiling the residue in hydrochloric acid. It is a dull olive green powder.

Adamantine boron is produced by submitting boracic acid and alumina, in a charcoal-lined crucible, to a temperature at which nickel melts. Crystals of boron result, which are found imbedded in metallic aluminum. Some of the crystals are red; others are yellowish. They are all extremely hard—almost as much so as the diamond itself. Corundum yields to the superior hardness of these crystals. If this substance could be produced cheaply, it might be substituted for the diamond for mechanical purposes.

Properties of Borax.

Borax is a well-known salt, which is composed of boracic acid, soda and water. In the language of chemists, it is a hydrated biphosphate of soda. It is a white salt, found in commerce, generally crystallized in hexahedral prisms, containing ten equivalents of water. It can be crystallized in octahedrons at the option of the chemist, in which case it takes up but five equivalents of water. It has a sweetish taste and an alkaline reaction. It dissolves in twelve parts of cold water and in two parts of boiling water. At a low heat it melts in its water of crystallization; if the heat be continued, it swells and becomes a white porous mass. At a red heat, it fuses into a transparent fluid, which becomes, when cold, a transparent solid resembling glass. Sulphuric acid, added to a solution of borax, unites with the soda, setting the boracic acid free, which, being but slightly soluble in water, falls as a precipitate, and may be separated from the sulphate of soda by washing.

Commercial borax often contains impurity, either accidental or as an adulteration. The following

Simple Tests

Will serve to detect the usual foreign substances contained in borax: When pure it should dissolve in twenty parts of cold water to a clear solution without color or residue. A sample heated to fusion should leave a residue weighing fifty-two per cent. If adulterated with nitrate of potash it will deliquesce when thrown on burning coals. If alum is present as an impurity its solution will react acid on litmus paper. Borax is often degraded by admixture of phosphate of soda, sometimes to the extent of twenty per cent., in which case its solution will give a yellow precipitate upon addition of molybdate of ammonia mixed with excess of nitric acid.

The natural impurities are the alkaline earths and the sulphate and chloride of sodium. Alkaline earths give a precipitate with carbonate of soda. Sulphate of soda gives a white precipitate with chlorides of barium, insoluble in acids. Chloride of sodium gives a similar precipitate with nitrate of silver.

Borax is Used in the Arts

As a flux for soldering metals and in melting them; largely as a glaze for pottery. It has a limited use in the laundry to give softness to the water and a peculiar whiteness to laces and fine clothing; as a wash for the hair and

in several arts and manufactures. A solution of borate of ammonia renders light cotton goods non-inflammable. Borate of manganese is a powerful dryer for paints and oils. Borax has only a limited use in medicine. Borax

In a Crude State

Came formerly to Europe from Indis, Thibet and Persis, under the name of "tincal." According to Prof. Royle, the name "tincal" is derived from *tincana*, the Sanscrit for borax. The Dutch for a long time retained to themselves the secret art of refining tincal or crude borax. When first practiced in France, so great was the prejudice in favor of the Dutch article that they were compelled to ship it first to Amsterdam to be returned to France as "Dutch Borax."

Tincal is shipped in large quantities from Calcutta to Europe. It is quite impure and is covered with a greasy substance which must be removed before the crystals can be dissolved. This oily coating is said to be the result of immersion in asses' milk to prevent efflorescence of the tincal during shipment.

An analysis by Klaproth showed its composition to be soda, 14.5; boracic acid, 37; water, 47.

Sources of Borax.

Borax Lake, in Thibet, from which large quantities are produced, is fifteen days journey from Teshoo Lombo. Being at a high altitude its waters are frozen over during the greater part of the year. The borax is dug from the margin of the lake. The crystals removed are found to be replaced by others after the lapse of a certain time. Another source of borax is the Tuscan Lagoons in Italy. This remarkable region in which they are situated is six miles from the Mediterranean and thirty-six miles north of Leghorn. Boiling springs are common and in places jets of steam issue from the ground, fumes of sulphuric and sulphuretted hydrogen are so dense that animals are often found suffocated in the ravines and depressions of the earth. The waters are highly charged with mineral matter and gases. The discovery of

Boracic Acid in these Boiling Springs,

In the year 1777, by Haefr, Chemist to the Grand Duke, has already been mentioned. In 1818 the first attempt was made to collect the acid, but failed on account of the cost of fuel used to concentrate the waters. In 1827, M. Lardarel, a Frenchman, suggested the ingenious idea of using the natural heat for that purpose. Success followed, which has continued ever since.

It was found that the boracic acid did not come to the surface, but probably crystallized in the fissures below. When water was let in from above, it was forced back by the issuing steam, charged with the acid. Large artificial lagoons of masonry are built over the fissures, which are supplied with fresh water from neighboring streams. The contour of the country being favorable, a succession of these are formed, one below the other. From the upper basin the water is allowed to flow through the others, at each slip becoming more heavily charged, until having passed through eight of them it is found to have a specific gravity of 1.007, and to contain 0.5 per cent. of boracic acid. It is then allowed to flow into shallow vats of large surface capacity, where it is evaporated to dryness by the aid of natural steam conveyed through coils of iron pipe.

The acid so obtained is far from pure. Chemical analysis shows it to contain 76 per cent. of boracic acid, the impurity consisting of the sulphates of eight bases silica, water, free sulphuric acid, and chloride of ammonium. The crude acid is sent to England and France, where it is treated in the large way with carbonate of soda, and the crude borax so formed purified by re-crystallization.

Boracic acid is also

Found in Nature,

Combined in several minerals of a rare occurrence. The following is a list of them as far as known:

Bechillite,	Larderellite,
Boracite,	Rhodizite,
Cryptomorphite,	Sassolite,
Hydroboracite,	Szabibelyte,
Howlite,	Ulexite,
Lesgonite,	Warwickite.

Ulexite furnishes large quantities of borax to commerce. This curious mineral was first found in the nitre beds of Peru in small concretions, showing, when broken, interlaced silky crystals. It sometimes shows, when broken, enclosed crystals of gypsum and salt. It was first examined by Ulex, who showed that it contained boracic acid, some soda and water. It was afterward analyzed by A. A. Hayes, who proposed the formula $(\text{CaO}, 2 \text{BO}_3 + 6 \text{HO})$. He supposed the soda found by Ulex to result from mechanically mixed glauberite. For some time this mineral was called "Hayesene;" but Dana, in the last edition of his work on mineralogy, gives it the name of Ulexite, in justice to the first observer. It is very variable in its composition. Several samples from Iquique gave many results when analyzed. It is, however, a valuable source of borax, being manufactured extensively in England, where it is decomposed by boiling with a solution of carbonate of soda. To extract boracic acid from it in the laboratory, it may be treated with dilute boiling hydrochloric acid. The crystallized boracic acid is thrown down on cooling. Ulexite may be artificially formed by precipitating a solution of borax with nitrate of calcium.

Cryptomorphite is a soft white substance resembling chalk. Its composition is nearly the

same as that of Ulexite. It is a rare mineral. A specimen the size of a bean has been considered a valuable addition to the cabinet of the most celebrated mineralogists. It gives the reactions of lime and boric acid, and under the microscope with a high-power, rhombic crystals are seen, from which peculiarity it takes its name.

The detection of boracic acid qualitatively is simple and certain, whilst the determination of the quantity is attended with many difficulties.

The Best Test for Boracic Acid,

In minerals and compounds containing it, is to place the substance to be tested, in powder into a small evaporating dish; sulphuric acid is added to make a pasty mass after which absolute alcohol is poured in and a spirit lamp placed under the dish. When heated nearly to boiling the lamp is removed and the alcohol ignited; if left to burn quietly the yellow sodium flame masks to a great extent the green color imparted to the flame by the boric acid, but if a current of air is blown across the dish, not strong enough to endanger the extinction of the flame, but sufficiently to agitate it violently, the reaction becomes very distinct and well defined.

Any substance containing free boracic acid will give this reaction without previous addition of sulphuric acid. To test free boric acid with the blowpipe, reduce the substance to a powder, add a drop or two of water, mix with three times its volume of a flux composed of four and a half parts of bisulphate of potash and one of powdered fluorspar and expose a portion of the mixture in a loop of platinum wire to the inner flame of the blowpipe. A green flame indicates boracic acid. A similar flux, called Turner's flux, is two parts of fluorspar and one part of bi-sulphate of potash and is used in the same manner. These tests should be made in a dark place. Solutions to be tested should first be evaporated to dryness, and the test applied to the residue.

The Assay of Borax

Is made in several different ways. A very correct method is to dissolve a weighed quantity in water, to add hydrochloric acid in excess, to evaporate to dryness in a water bath, to add a few more drops of the acid and continue the evaporation until no more fumes of hydrochloric acid escapes. From the chloride of sodium so obtained precipitate the chlorine with nitrate of silver. Knowing the amount of chlorine it is a simple operation to calculate the soda, and from the soda the quantity of boracic acid which was combined with it. If the original sample contained any chlorine, the amount must be determined in a fresh portion, and deducted from the assay.

Borax may also be

Determined Volumetrically.

For this assay a solution of sulphuric acid must be prepared, in which an exact chemical equivalent of the acid shall be contained in each litre. This acid solution, called "normal sulphuric acid," must be carefully preserved in a well-stoppered bottle, as on its purity and uniform strength depends the accuracy of the results. An equivalent of the borax to be assayed (or rather what would be an equivalent if it was pure) must then be dissolved in a litre of distilled water, in the manner and with the precautions to be described. Now if both solutions contain exact equivalents, they would neutralize each other if poured together. In a like manner if a tenth of each solution was mixed, they would neutralize each other. The tenth of a litre is a convenient measure for the assay, because it contains 100 cubic centimetres. If 100 CC of the acid solution neutralized 100 CC of the borax solution, it would be an evidence that the sample was pure. If 80 CC only was required, the sample contains 80 per cent. of borax. In other words, each CC of the acid solution represents one per cent. of crystallized borax in the sample.

When litmus is added to a solution of borax, only a purple-red color is seen while any borax remains undecomposed; but at the instant that the last atom of soda is changed to sulphate, a light red color appears.

One equivalent of crystallized borax $(\text{NaO}, 2 \text{BO}_3 + 10 \text{HO})$ is 190.8. The assay is made by dissolving—with heat—190.8 grammes of the air dried sample in less than a litre of distilled water, and filtering the solution into a litre flask. The filter must be washed with distilled water until the flask is full to the mark, when the whole is shaken together to well mix it. The experiment is made on one-tenth of the solution, which is 100 CC. This quantity is placed in a clean beaker, solution of litmus added until a deep color is imparted to the fluid. Normal sulphuric acid is then dropped in from a burette, graduated to 100 CC and tenths, until the color suddenly changes to a bright red. The first test may be made somewhat carelessly, as it will only be an approximation. The beaker is then washed out and the operation repeated on 100 CC more of the solution, this time with greater care. The result will be nearly correct. A third experiment will serve to verify the result.

Only borax can be estimated by this method. The determination of boracic acid in minerals and other substances is extremely difficult and can hardly be explained without an elaborate description. In the volumetric method described above, it is customary to deduct 0.5 CC to correct for the excess of sulphuric acid required to develop the red color in the assay.

SCIENTIFIC PROGRESS.

The Air We Breathe.

Much attention is now being paid to the characteristics of the atmosphere in various localities, and under diverse circumstances. Analyses show that air in open and exposed localities varies in the amount of oxygen, which it contains from 20.4 to 21.0 per cent. The most favorable localities, as on the heaths of Scotland, show the latter; while it is necessary to go underground into a mine to find the latter. Well ventilated mines show about 20.4; while our ill ventilated mines, where it is possible to labor, rarely go below 20. These results are derived from thousands of careful analyses. Cavendish made 500 in the course of his enquiries.

The cursory reader may think that the difference between 21, and 20 in the per cent. of oxygen in the atmosphere can have but little importance, and is hardly worth enquiring. It is true that the deficiency named is small when considered in figuring; but when we reflect that while 21 represents the largest amount of oxygen ever found in the best natural atmosphere, a candle goes out at 18.50, and life can barely be sustained for a short time at 17.20, the importance of a small per cent. of difference becomes apparent. Even so small a difference as that between 21, and 20.981 is equal to 190 in a million; and if we place impurity in water at that rate it will amount to 13 grains in a gallon. This amount would be considered enormous, if it consisted of putrifying matter or any organic matter usually found in water.

But we drink but a small quantity of water, and with such a percentage we might be several days in swallowing the whole 13 grains; whereas we take into our lungs from 1500 to 2000 gallons of air each day. Moreover the blood receives such impurities almost entire, very little being filtered out in its passage to the lungs; while the stomach has powers of disinfection and destruction which renders harmless very much of the organic impurities contained in water. But if we take the air found in the pit of a theatre, generally about 20.740 we find the minute analyses becomes a matter of the highest importance.

The senses are bad and inefficient guides to the wholesomeness of air as regards the amount of oxygen and carbonic acid, save when the former is reduced and the latter increased to such an extent that the lungs seem to refuse to expand and the whole vital action is threatened with paralysis. Rooms badly ventilated, which contain less than 20.7 per cent. of oxygen are very unwholesome, and the necessity of taking into consideration the proportion of oxygen and carbonic acid in the sanitary inspection of factories and workshops is abundantly evident from the results obtained by Dr. Smith.

Mr. Clemson, a French chemist, made public, in 1856, a theory with regard to the presence of living organisms in the atmosphere, so minute as to be almost or quite unabsorbable by the best microscope, and which organisms exerted a marked influence on health—in fact were the origin of most diseases to which men are subjected. He also argued that there is phosphoric acid in the air, derived from the successive generations after generations of myriads of these organisms, produced, living and dying in the atmosphere; that such organisms exist and are at work, assimilating from one to the other, preparing food for more perfect organisms, from the microscopic points of life to the most perfect animal existence. He also entertained the idea that the increased fertility of the earth by being broken up and exposed to the atmosphere, was due to the presence of such animalcules.

Nerve Power and its Correlations.

One of the most remarkable phenomena presented by contemporary science, is the tendency to unity of all sciences. An additional instance of this tendency has been given in a memoir by Mons. Matteucci on that power, which gives action to the nervous system. A great many physiologists have insisted upon the identity of electricity and this power; it is not, however, accepted for absolutely true, although it is admitted there is a great analogy between them. Mons. Matteucci agrees there are serious objections to this theory, and he holds them to be different agents, but he shows there is a similar analogy between them to that which exists between light, heat, and electricity. He instances tourmaline, which develops electricity when heated, and he shows there is a like relation between electricity and the nervous power.

Reminding the reader that the essential characteristics of imponderable bodies, such as the immense rapidity of their motions, the ease with which they escape observation, and the transformation of each into the other belong to this nervous power as well as to electricity, light, and heat; he goes on to represent this nervous power by ether. "This nervous power," he says, "consists in a particular motion of ether. Ether diffused throughout the nervous system as it is diffused throughout the

universe, assumes the characteristics of nervous power by the modifications which are introduced into the relative disposition of its atoms by the organization of the nervous substance." Whoso the ether is directed from the extremities towards the brain it produces sensation. When it is directed from the brain to the extremities it produces contraction. Thus this hypothesis of ether which has long been admitted in Astronomy, natural philosophy and chemistry, is invading physiology; and electricity, heat, light, and nervous power obey the same laws, and are produced and may be transformed each by the other.

Curious Facts in Astronomical Calculations.

Few persons are aware of the nicety required in astronomical observations. The rod used in measuring a base line is commonly somewhere about ten feet long; and the astronomer may be said to apply the very rod to mete the distance of the stars. An error in placing a fine dot which fixes the length of the rod, amounting to one-five-thousandth of an inch—the thickness of a single silken fibre—will amount to an error of seventy feet in the earth's diameter, of three hundred and sixteen miles in the sun's distance, and to more than sixty-five millions of miles on that of the nearest fixed star. As the astronomer in his observatory has nothing farther to do with ascertaining lengths or distances, except by calculation, his whole skill and artifice are consequently exhausted in the measurement of angles, it being by these alone that spaces inaccessible can be compared. Happily a ray of light is straight; were it not so, in celestial spaces at least, there was an end of astronomy. Now, an angle of a second—3,600 to a degree—is a subtle thing. It has an apparent breadth utterly invisible to the unaided eye, unless accompanied with so intense a splendor, as in the case of a fixed star, as actually to raise by its effect on the nerve of sight, a spurious image having a sensible breadth. A silkworm's fibre, such as has been mentioned above, subtends an angle of a second at three and a-half feet distance; a cricket ball, two and a-half inches diameter, must be removed, in order to subtend a second, about eight miles, where it would be utterly invisible to the sharpest sight, aided even by a telescope of some power. Yet it is on the measure of one single second that the ascertainment of a sensible parallax in any fixed star depends; and an error of one-thousandth of that amount—a quantity still unmeasurable by the most perfect of instruments—would place the star too far or too near by 200,000,000 miles, a space which light requires one hundred and eighteen days to travel.

Carbonic Acid in the Air.

Sir Walter Trevelyan, in a communication recently addressed to the *Gardeners' Chronicle*, starts a curious and ingenious theory on the advantage of a small percentage of carbonic acid in the air. The sedative nature of this gas is well known, and with most animals in a state of nature, sleep comes on at the time when plants commence to develop carbonic acid, that is, at sunset—and it relaxes its hold about sunrise, when plants begin to exhale oxygen. Further, when men and animals compose themselves to sleep, they not only do so in the position which gives the greatest relaxation to the muscles, but "they place the head so as to favor the accumulation of that gas about it, and consequently its inhalation. The head of a man, when at rest, generally lies low, on a soft and depressed pillow, those of most quadrupeds conched between their paws, and those of birds nestled among the feathers of their backs or wings," so that in all these cases, owing to the low and confined position of the mouth and nostrils, much of the air must be inhaled again and again, and become gradually mixed with a larger proportion of carbonic acid. He also adduces the fact that the carnivora, who are nocturnal in their habits, retire during the day to deep and narrow caverns, in which the air becoming vitiated by their respiration, tends to promote sleep. The obvious objection to this theory is, that the carbonic acid becomes rapidly diffused, so that the air in every part of the room would probably be found to be sensibly of the same composition.

SPECTRA OF GASES UNDER PRESSURE.—When the spark from an inductorium is made to pass through a tube containing a gas at the ordinary pressure, the light is feeble, and presents in the spectroscopic very indistinct bands; but if the pressure be slowly increased, the bands become brighter and larger, in the end producing a continuous spectrum. On still further increasing the pressure to about 200 atmospheres, the electric current ceases to pass, and no spectrum is formed.

A NEW QUALITY IN MORPHINE.—A German chemist has discovered that if morphine, which is sometimes used effectually to slay vomiting, be heated with hydrochloric acid, it will become the most powerful emetic known. The effect is produced by introducing a small quantity under the skin and sometimes by spilling it on the skin, but the vomiting soon subsides and leaves no nausea. The discoverer calls the new agent ememorphia.

WONDERS OF THE DEEP.—Some interesting deep sea explorations were made during the recent passage of the British Exploring Ship, Challenger, from Eaglesad to the West Indies. The sounding line and dredge were kept constantly going. The former showed that a pretty level bottom runs off from the African coast, deepening gradually until the depth of about three and one-half miles is reached, at about one-third the distance from the African coast to the West Indies. Five hundred miles farther west there is a comparatively shallow region, a little less than two miles in depth. The water then deepens again to about three miles, and so continues until the immediate vicinity of the islands is reached.

Small quantities of animal life were brought up all along the route, even from the greatest depths, just sufficient to show that life existed, even under such an immense pressure.

At the deepest spots it required 12 hours to reach bottom and haul up the dredge.

Nearly everything of life that came up from two miles and over in depth was new, and among the most interesting novelties was a new species of lobster, perfectly transparent. Living beings were also found in which the eyes constituted the chief bulk of the animal; on the other hand, one new crustacean was brought to light in which not even a germ of an eye could be found. Nature, however, had supplied that deficiency with a great multitude of long and most delicate claws or feelers.

COMBUSTIBILITY OF LEAD, IRON, ETC.—It is well known that iron, minutely divided, burns as readily as tinder. Indeed, poor irona chemically divided will even take fire by being gently tossed into the air, or dropped from an elevation of a few inches only. It is not, however, so generally known that lead, similarly divided, will burn with as much readiness as iron, and with even a greater brilliancy. Indeed, lead is nearly as inflammable as phosphorus, and the only reason why it does not burn under ordinary circumstances is because the solid product of combustion forms a film that prevents the contact of the oxygen of the atmosphere with the surface of the unburned portions of the metal. Perhaps the most wonderful provisions of nature are those admirable arrangements by which these combustible properties of the metal are not only kept under proper control, but though so inflammable, are nevertheless made to serve as our strongest resistors of combustion.

SPONGE IRON is produced by calcining powdered iron ore with charcoal. Such iron forms a most excellent filter, more powerful, it is said than even animal charcoal. It is said that even sewage water filtered through a layer of this substance is completely purified, and will remain sweet for an almost indefinite time.

MECHANICAL PROGRESS.

Steel vs. Iron.

One great objection to the more general employment of steel for purposes where much strain is to be endured, and where human life is to be risked, is, according to Mr. Robert Mallet, the lack of some reliable and ready means of testing the same. The very quality that chiefly recommends steel is the one most difficult to determine, and the most dangerous if absent. The strength of steel in plated structures as proportioned to iron, is usually rated something like 10 to 6.

One great source of imperfection in steel is the injuries which it is liable to sustain in the process of manufacture; when a bar or plate gets a hammer-blow while hot, or anything like a dent, or sustains any concussion which causes a sudden change of dimension, however minute, such bar or plate, in most cases, is certain to give way at the point of concussion on receiving a strain much less than would break the bar elsewhere. Anything, also in the nature of a superficial injury to a plate, is much more serious in its effects on steel than on iron.

Steel as adapted for rails is said to show greater difference of good and evil than it does under any other conditions for use. A commission of fifteen railway engineers recently reported that the weight of evidence was in favor of employing steel instead of iron for rails in railway use; but especial stress was laid upon the necessity that existed for the exercise of the most extreme care in the manufacture of the rails—especially in handling them while hot. Experience had shown that steel rails almost always break at the point where some injury had been received while the rail was hot. In most cases such rails break in a few weeks; while perfectly sound rails work without any perceptible wear or injury, for 12 or 15 years.

Steel is prone to be very much superior to iron when used for gearing; but it is proved that gearing mounted on timber framing is much more liable to fracture than when properly fitted on an iron frame. Wood, even when well secured, will warp and twist sufficient to disarrange delicate machinery.

Close attention is being paid to the use of steel as far as adopted, with the view of its more general adaptation, according to the greater or less extent of success which may attend its present employment.

Indurating Iron on a Large Scale.

The iron work of the new bridge, lately built at Blackfriars (London), was indurated by a process patented by Messrs. Morswood & Co., and is alike important from the great cost which it incurred, and the testing of a rather abstruse chemical formula for the preservation of iron from oxidation and decay. The process is as follows: The iron was thoroughly cleaned, and heated to the requisite temperature in a furnace planned by the inventors. When this temperature is attained, it is plunged into a bath of prussiate of potash, and chloride of potassium, so that when the iron is withdrawn it may easily part with the surplus of the aforesaid chemicals, which should run off like oil. The iron is then to be dipped into boiling water, containing a certain proportion of cyanide of potassium; from thence it is removed to a bath for a final washing. All the processes are carried on under cover, and before exposure to the atmosphere the iron is coated with an asphaltum paint twice, at given intervals; and again it receives two coats after fixing. Of course, all the necessary planing, drilling, and fitting is done preparatory to the indurating. The time the iron remains in the bath varies from one to five minutes, according to the weight of the metal to be operated upon.

The elaborate character of the process to which the contractor was rigidly bound, will account for the large sum which was expended in carrying out this part of the work: \$20 per ton was allowed the contractor for the indurating and painting. Thus, \$80,000 was spent in this effort to prevent oxidation, no greater proof of which, in its damaging results, can be offered than the case of the cleaning of the oxide (rust) from the Menai Bridge, from which was lately removed above 40 tons of oxide of iron.

ANNEALING.—The change produced by annealing is not well understood. Most of the malleable metals assume two distinct forms: one crystalline, which is the result of slow cooling; and the other fibrous, which is brought about by hammering or rolling. If hammered or rolled beyond a certain point, the metals become so hard that they cannot be bent without breaking. If annealed beyond a certain point, the metals become crystalline. Thus, zinc may be drawn into a very flexible and tenacious wire; but if kept in boiling water too long it resumes its original brittleness, and displays a crystalline appearance when broken. The particles of the metal change their arrangement without altering the external form, and this change may be brought about in various ways; thus, brass wire loses its tensile by exposure to the fumes of an acid, and even by air acting on its surface in a damp atmosphere. Hence it is necessary to preserve wire, such as is used in the manufacture of pins, in a dry air, or under the surface of water.

GERMAN STEEL IN CHINA.—It is a fact worth noting that, during the past two or three years, German steel has been gradually gaining ground in the estimation of the native manufacturers of Shanghai, to the very great detriment of the importations of steel from England. While fully recognizing the superiority of the English article, the natives, with their indifferently art, find the quality of the German product more suitable for their inartistic workmanship than that imported from this country, the high temper of which renders it difficult of manipulation by them. The Germans are importing at a profit of about eight per cent., an article called by the natives "bamboo steel," which is simply an ordinary bar dented at intervals of about two inches, and is therefore easily convertible into appropriate lengths.

HOW FAST CAN A WHEEL BE MADE TO REVOLVE?—There is no limit to the number of revolutions which a wheel may be made to make in a given time. Savart, in his experiments on the theory of sound (acoustics), made wheels to revolve from one thousand to two thousand times per minute; but this has been surpassed by Foucault, who invented an apparatus for measuring the velocity of light, to which a small wheel with a mirror was attached, which might be made to revolve 600, 800, and even 1,000 times per second, or 60,000 times per minute. These are the most rapid revolutions thus far obtained that we are aware of, but there is not the slightest reason why even this should not be surpassed. It is evident that for such great velocities cogwheels are out of the question; only hands or strings can be used.

NOW, AND THEN.—A few years since it was thought to be the perfection of economy to saw sticks of mahogany and rosewood into thin veneerings; to-day the loss incurred by this process is ruinous, because half the timber is lost in saw dust. By using a machine that shaves off the slice, none of the material is wasted, and the saving on a single log of rosewood is said to amount to \$600.

DETERMINING STEEL.—An English engineer says that a good method to determine between steel and iron is to burn filings of the samples in a flame, as steel would scintillate, while iron would be merely laminary.

Table of Fluctuations.

Showing Highest and Lowest "Regular" Sales of Mining Stocks on the Board List of the San Francisco Stock and Exchange Board, during the last Four Weeks, together with Number of Feet, Shares, Last Dividends and Assessments.

THIS TABLE is published regularly in our City Stock Edition of the MINING AND SCIENTIFIC PRESS, and on FRIDAYS in the DAILY MINING PRESS.					1873.									
NAME OF COMPANY					LAST ASSESSMENT.	WEEK ENDING								
						May 17		May 24		May 31		June 11		
						High	Low	High	Low	High	Low	High	Low	
WASHOE.														
Alamo Gold and Silver M. Co	3000	6000		5, Mch. '71	71	6	1 3/4			1	1	1	3 1/2	
Alpha Consolidated	3000	30000		1, May '71	71	47	25	40	33	35	31	35	27	
Alta	3000	30000		1, May '71	71	10 1/2	8 1/2	7 1/2	6 1/2	7 1/2	6 1/2	5 1/2	4 1/2	
Arizona & Utah	1900	18000		4, Feb. '73	73	10 1/2	8 1/2	7 1/2	6 1/2	7 1/2	6 1/2	5 1/2	4 1/2	
Bacon Mill and Mining Co.	65	2400		27, July '71	71	23 1/2	17 1/2	17	15	10	6	7	3	
Baltimore Consolidated	1040	10400		3, June '73	73	90 1/2	71 1/2	87 1/2	80	104	86	111	84	
Best & Belcher	224	22400		6, Feb. '71	71	4	3	3	3	4	3	4	3	
Bowers	2500	25000		7, Jan. '71	71	23 1/2	19 1/2	19	17	23	19	23	19	
Bullion	2500	25000		45, Aug. '72	72	23 1/2	19 1/2	19	17	23	19	23	19	
Calendonia Silver Mining Co.	5000	20000		4, Feb. '73	73	32	22	24	17 1/2	25	19	28	18	
Central	150	2000		3, June '71	71	23 1/2	19 1/2	19	17	23	19	23	19	
Chollar	100	2000		3, June '71	71	23 1/2	19 1/2	19	17	23	19	23	19	
Chollar-Potosi	280	2800		29, Feb. '72	72	80	58	64	60	68	62	65	61	
Confidence Silver Mining Co.	130	2450		6, May '73	73	11 1/2	8 1/2	9	8 1/2	9 1/2	8 1/2	9 1/2	8 1/2	
Consolidated Silver Mining Co.	340	3400		10, Mar. '73	73	11 1/2	8 1/2	9	8 1/2	9 1/2	8 1/2	9 1/2	8 1/2	
Consolidated Virginia	1160	23200		15, June '71	71	81	76	76	71	94	80	102	90	
Cook & Geyer	1600	2400		1, Sept. '72	72	135	120	120	117	140	117	135	115	
Crown Point Gold and S. M.	2000	2400		31, June '73	73	3	3	3	3	3	3	3	3	
Danahy	2000	2400		2, July '73	73	3	3	3	3	3	3	3	3	
Dardanelles	1200	2400		8, May '73	73	3 1/2	1 1/4	2 1/4	1 1/4	1 1/4	1	1 1/2	1 1/2	
Eclipse	70	2300		21, May '71	71	16 1/2	11 1/2	11 1/2	11 1/2	13 1/2	11 1/2	13 1/2	10 1/2	
Empire Mill and Mining Co.	400	8000		12, Apr. '72	72	16 1/2	11 1/2	11 1/2	11 1/2	13 1/2	11 1/2	13 1/2	10 1/2	
Eschschuer	3000	30000		9, June '72	72	16 1/2	11 1/2	11 1/2	11 1/2	13 1/2	11 1/2	13 1/2	10 1/2	
Flower	3000	12000		2, Jan. '73	73	16 1/2	11 1/2	11 1/2	11 1/2	13 1/2	11 1/2	13 1/2	10 1/2	
Franklin	3000	12000		2, Jan. '73	73	16 1/2	11 1/2	11 1/2	11 1/2	13 1/2	11 1/2	13 1/2	10 1/2	
Globe	1200	20000		26, Oct. '70	70	18	11	14 1/2	12 1/2	14	17 1/2	14	12 1/2	
Gould & Curry Silver Mining	400	1600		36, April '71	71	63	49	51	42	56	48	57	42	
Hale & Norcross	184	100000		16, Apr. '73	73	63	49	51	42	56	48	57	42	
Imperial	184	100000		16, Apr. '73	73	63	49	51	42	56	48	57	42	
Insurance	2000	30000		1, May '73	73	4	3	3	3	4	3	4	3	
Julia Gold and Silver M. Co.	2000	30000		14, June '73	73	5	3	3	3	5	3	5	3	
Justice	2000	30000		14, June '73	73	5	3	3	3	5	3	5	3	
Knickerbocker	1200	2400		5, Mch. '70	70	14	10	12	12	15	10	12	12	
Lady Bryan	3000	30000		5, Mch. '73	73	9	6	6	6	9	6	9	6	
McMeans	3000	30000		1, May '73	73	9	6	6	6	9	6	9	6	
May Gold and Silver Mining	1000	10000		1, May '73	73	3 1/2	2 1/2	2 1/2	2 1/2	3 1/2	2 1/2	3 1/2	2 1/2	
New York Consolidated	3000	30000		4, May '73	73	3 1/2	2 1/2	2 1/2	2 1/2	3 1/2	2 1/2	3 1/2	2 1/2	
Occidental	3000	30000		1, Mch. '73	73	24	19	19	19	24	19	24	19	
Ophir Silver Mining Co.	1000	16000		23, Mch. '73	73	47	35	37	30	49	34	47	36	
Overman Silver Mining Co.	1200	12000		26, June '73	73	56	40	42	34	54	40	55	32	
Phil Sheridan	1200	12000		26, June '73	73	56	40	42	34	54	40	55	32	
Rector	3000	30000		2, Feb. '71	71	11 1/2	8 1/2	8 1/2	8 1/2	11 1/2	8 1/2	11 1/2	8 1/2	
Rock Island	3000	30000		2, Feb. '71	71	11 1/2	8 1/2	8 1/2	8 1/2	11 1/2	8 1/2	11 1/2	8 1/2	
Savage	800	16000		52, June '73	73	160	107	130	105	130	105	160	128	
Segregated Belcher	160	6400		4, July '70	70	60	41	47 1/2	32	60	41	61	40	
Senator Silver Mining Co.	2400	24000		7, Feb. '71	71	27	11	13	12	15	11	13	10	
Sierra Nevada	2000	20000		11, Jan. '71	71	27	11	13	12	15	11	13	10	
Silver Hill	5400	54000		36, April '71	71	17	11	13 1/2	11 1/2	15 1/2	12 1/2	14	12	
Silver King	2000	20000		1, Dec. '71	71	27	11	13 1/2	11 1/2	15 1/2	12 1/2	14	12	
Snowflake	2000	20000		1, Dec. '71	71	27	11	13 1/2	11 1/2	15 1/2	12 1/2	14	12	
Snowflake and S. M.	1100	11000		1, Dec. '71	71	27	11	13 1/2	11 1/2	15 1/2	12 1/2	14	12	
Snowflake	1100	11000		1, Dec. '71	71	27	11	13 1/2	11 1/2	15 1/2	12 1/2	14	12	
Snowflake	1100	11000		1, Dec. '71	71	27	11	13 1/2	11 1/2	15 1/2	12 1/2	14	12	
Snowflake	1100	11000		1, Dec. '71	71	27	11	13 1/2	11 1/2	15 1/2	12 1/2	14	12	
Snowflake	1100	11000		1, Dec. '71	71	27	11	13 1/2	11 1/2	15 1/2	12 1/2	14	12	
Snowflake	1100	11000		1, Dec. '71	71	27	11	13 1/2	11 1/2	15 1/2	12 1/2	14	12	
Snowflake	1100	11000		1, Dec. '71	71	27	11	13 1/2	11 1/2	15 1/2	12 1/2	14	12	
Snowflake	1100	11000		1, Dec. '71	71	27	11	13 1/2	11 1/2	15 1/2	12 1/2	14	12	
Snowflake	1100	11000		1, Dec. '71	71	27	11	13 1/2	11 1/2	15 1/2	12 1/2	14	12	
Snowflake	1100	11000		1, Dec. '71	71	27	11	13 1/2	11 1/2	15 1/2	12 1/2	14	12	
Snowflake	1100	11000		1, Dec. '71	71	27	11	13 1/2	11 1/2	15 1/2	12 1/2	14	12	
Snowflake	1100	11000		1, Dec. '71	71	27	11	13 1/2	11 1/2	15 1/2	12 1/2	14	12	
Snowflake	1100	11000		1, Dec. '71	71	27	11	13 1/2	11 1/2	15 1/2	12 1/2	14	12	
Snowflake	1100	11000		1, Dec. '71	71	27	11	13 1/2	11 1/2	15 1/2	12 1/2	14	12	
Snowflake	1100	11000		1, Dec. '71	71	27	11	13 1/2	11 1/2	15 1/2	12 1/2	14	12	
Snowflake	1100	11000		1, Dec. '71	71	27	11	13 1/2	11 1/2	15 1/2	12 1/2	14	12	
Snowflake	1100	11000		1, Dec. '71	71	27	11	13 1/2	11 1/2	15 1/2	12 1/2	14	12	
Snowflake	1100	11000		1, Dec. '71	71	27	11	13 1/2	11 1/2	15 1/2	12 1/2	14	12	
Snowflake	1100	11000		1, Dec. '71	71	27	11	13 1/2	11 1/2	15 1/2	12 1/2	14	12	
Snowflake	1100	11000		1, Dec. '71	71	27	11	13 1/2	11 1/2	15 1/2	12 1/2	14	12	
Snowflake	1100	11000		1, Dec. '71	71	27	11	13 1/2	11 1/2	15 1/2	12 1/2	14	12	
Snowflake	1100	11000		1, Dec. '71	71	27	11	13 1/2	11 1/2	15 1/2	12 1/2	14	12	
Snowflake	1100	11000		1, Dec. '71	71	27	11	13 1/2	11 1/2	15 1/2	12 1/2	14	12	
Snowflake	1100	11000		1, Dec. '71	71	27	11	13 1/2	11 1/2	15 1/2	12 1/2	14	12	
Snowflake	1100	11000		1, Dec. '71	71	27	11	13 1/2	11 1/2	15 1/2	12 1/2	14	12	
Snowflake	1100	11000		1, Dec. '71	71	27	11	13 1/2	11 1/2	15 1/2	12 1/2	14	12	
Snowflake	1100	11000		1, Dec. '71	71	27	11	13 1/2	11 1/2	15 1/2	12 1/2	14	12	
Snowflake	1100	11000		1, Dec. '71	71	27	11	13 1/2	11 1/2	15 1/2	12 1/2	14	12	
Snowflake	1100	11000		1, Dec. '71	71	27	11	13 1/2	11 1/2	15 1/2	12 1/2	14	12	
Snowflake	1100	11000		1, Dec. '71	71	27	11	13 1/2	11 1/2	15 1/2	12 1/2	14	12	
Snowflake	1100	11000		1, Dec. '71	71	27	11	13 1/2	11 1/2	15 1/2	12 1/2	14	12	
Snowflake	1100	11												

Our Weekly Stock Review.

THURSDAY EVE, June 12, 1873.

There has not been much doing in stock circles this week; business was slack, sales light and prices low. The week has been characterized as an extremely dull one. The only thing of interest is the advent of 5 new dividend-paying companies and the very large ones of some of the old stagers. The dividends are as follows:

Mine.	Per Share.	Amount.
Belcher.....	\$10	\$1,040,000
Crown Point.....	10	1,000,000
Meadow Valley.....	1	60,000
K. K. Consolidated.....	25c	7,500
Eureka, (Grass Valley).....	1	20,000
Black Bear.....	50c	15,000
La Grange Hydraulic.....	25c	7,500
		\$2,132,000

The dividends of the Crown Point and Belcher this year have been as follows:

	Belcher.	Crown Point	Total.
February.....	\$312,000	\$300,000	\$612,000
March.....	416,000	300,000	716,000
April.....	520,000	500,000	1,020,000
May.....	832,000	1,000,000	1,832,000
June.....	1,040,000	1,000,000	2,040,000

Total, five mos. \$3,120,000 \$3,100,000 \$6,220,000

The dividend of the Belcher mine this month is the largest ever paid by a mining company on this Coast or anywhere else, as far as we know. The production of Belcher for the month of May was \$1,500,000. The net profits, \$1,130,000, of which \$1,040,000 was paid as a dividend, and \$96,000 carried over to the surplus fund. There seems to be a sort of friendly emulation between the Crown Point and Belcher, and the latter is \$40,000 ahead, thus far. The Crown Point has paid out in two years the sum of \$5,440,000 as dividends. The disbursement of these immense sums ought to make money a little easier in the city, but it does not seem to have done so as yet.

On Friday prices on the Comstock mines advanced to some extent, Belcher rose \$2; Crown Point, \$3; Chollar, \$4; Con. Virginia, \$8; Caladonia, \$1; Gould & Curry, \$2; Ophir, \$3; Overman, \$3; Savage, \$24. Saturday opened with a pretty strong market and firm prices, but some declines were evident, at close Belcher was \$2.50 lower; Crown Point, \$3, Confidence, \$1; Gould & Curry, \$1; Hale & Norcross, \$3; Overman, \$3; Ophir, \$3; Savage, \$2; Yellow Jacket, \$4.

On Monday the market was dull and weak, and prices were low. Belcher fell \$3 from Saturday's sales; Baltimore, \$1; Caladonia, \$1.50; Con. Virginia, \$2; Crown Point, \$7; Gould & Curry, \$1; Hale & Norcross, \$3; Kentuck, \$1; Ophir, \$3; Overman, \$2; Savage, \$14; Jacket, \$4.

Tuesday, prices were still low and there were few orders to buy, business being very slack in the Board. On Wednesday the business done was small, but prices were a little firmer. Belcher rose \$3; Chollar, Potosi, \$1; Crown Point, \$2; and Hale & Norcross, \$1.

The market to-day did not show much improvement; closing prices may be seen by reference to our stock tables.

MINING SUMMARY.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned:

California.

ALPINE COUNTY.

THE OUTLOOK.—Alpine Miner, June 7: In the Silver Glance 100-ft level the improvement over former and more superficial explorations is very marked, and must be satisfactory to all concerned. Mr. Hunter's experiment in wet crushing ore taken from the Tarahish settles him that a large percentage of the value can be so saved, and the balance concentrated in the form of sulphurets of rich quality. From the ore worked Mr. H. realized 21½ pounds of bullion, quite rich in gold, and he has his sulphurets still on hand. Mr. Chalmers will start his mill near Silver Mountain in a few days, and will still further test the wet process.

EXCHAMBER.—The mill has been delayed in its starting by the absence for 2 weeks of the machinist, and when we were up there on Monday, instead of finding it running, a large force of workmen were still engaged in finishing up. The business of hauling ore from mine to mill had been entered upon in earnest, and we were informed that the prospect was good for a steady supply.

CALAVERAS COUNTY.

SIMPSON & CO.—Calaveras Chronicle, June 7: Monday last we visited their hydraulic claim, in Tunnel ridge, Stimulated by the gratifying result of a recent healthy clean-up, the Co. are pressing operations with renewed vigor, and an immense quantity of gravel is daily passing through the sluice. The ore is rich, and the easy and rapid working of the mine is the unusually large quantity of rocks which the gravel contains, rendering the employment of quite a force of hands necessary for their removal.

DURVA.—Everything is progressing favorably. Washing continues uninterruptedly, and the powerful hydraulic is playing the deuce with the Stockton ridge—an immense derrick is being erected in the claim for the purpose of removing the masses of cement recently uncovered.

STRAUCK GRAVEL.—We learn that Brackett & Co., who for some months past have been engaged in running a tunnel to strike the channel in Tunnel ridge, opposite the entrance to the Gulch mine, have now completed the tunnel. The gravel has been washed down to the bedrock with results abundantly remunerative to the proprietors for the great expense and labor incurred.

WOLVERINE.—We are yielding intelligence of a flattering future to the Wolverine mine, located near Railroad Flat. The 300-ft. levels, north and south, are being rapidly extended, a chimney of first-grade ore, 60 ft. in length, having already been developed. Stopping is being vigorously prosecuted, twenty-seven hands being employed in and about the mine. The ledge averages 4 ft. in width. The yield of the mine during the past month was \$5,000, the scarcity of water preventing the running of the battery but 16 hours a day. The

yield for the present month will probably fully equal that of last.

EL DORADO COUNTY.

SILVER.—Mountain Democrat, June 7: A short time ago we paid a visit to this mine, which is located a few miles north from Greenwood, a short distance above the Cedarberg, in the rich mining belt stretching from Greenwood to Spanish Dry Diggings and across into Placer county. The ledge is large and well defined, with a foot-wall of trap and a hanging wall of slate, trending uniformly at an angle of about 45 degrees, dipping to the eastward, the course of the ledge being a little east of north and a little west of south. The discovery of the ledge was effected by following rich finds of quartz gold up a small gulch, until the break in the ledge was reached. Here a cut was opened to the southward, the ledge stripped and the overhanging rock washed off for a distance of 100 ft. or more and to a depth of 20 or 30 ft., with highly satisfactory results. Then, to the southward of the point reached in the cut, a shaft was sunk on the ledge to a depth of over 150 ft., yielding splendid pay from the top down, so uniformly rich that we will not tax the credulity of our readers by reporting the exact figures. A goodly portion of the ore from the shaft was selected from the mass and separated into reduced, yielding fabulously, and the remainder, which is not yet all crushed and will probably run the mill until operations are resumed in the shaft, has yielded fully up to the usual average of first-class mines. The mill is, and the new hoisting works when completed will be run by water power, with highly-rigid wheels, with over 200 ft. pressure, from a ditch owned by the owners of the mine.

Cedarberg, who discovered and opened the famous mine which bears his name, has located and commenced sinking a shaft on the first extension to the north of the Siliver, which he considers far more valuable than his old claim.

HUMBOLDT.

ECLIPSE.—Silver State, June 7: Work has been resumed on the Eclipse mine by the owners, Messrs. Fielding, Fellows, Davis and Cavanaugh. Considerable labor has been expended in developing it, and it is prospecting to considerable extent by incline shaft and tunnel. It is considered a good mine, and has produced some excellent results, but, like those of many other claims in the district, have not the means to develop it speedily and thoroughly.

RICH ORE.—It is reported that very rich ore has been struck in the Mammoth, in Star District.

INYO COUNTY.

THE BLOOMER.—Inyo Independent, June 7: Beaudry's furnace turned out 4,530 bars of bullion during the last month, less 3 days, when the furnace was undergoing repairs.

KERN COUNTY.

CLEAN UP.—Havilah Miner, June 7: A clean up last Thursday of 22 tons of surface rock of the Joe Walker mine returned about \$1,000. The mine shows every evidence of resulting in a grand success.

MARIPOSA COUNTY.

MARSH MINE CO.—Mariposa Gazette, June 6: From Mr. H. G. Ooward, Superintendent of the mining operations now going on under the above designation, we learn that the Co. have hoisting works already in operation, and are taking out quartz. A mill of ten stamps is in course of construction, and will be completed within six weeks. The mine is situated on Gentry's Gulch at the point known as "Funk Hollow," and was formerly called the Funk Mine. It was worked successfully by Mr. Ooward from 1860 to 1869, and a large amount of gold taken out. At one time it was considered, and was really, one of the richest mines in that section of country.

MONTEREY COUNTY.

NEW QUOTABLE MINES.—Hollister Advance, June 7: On our late trip to San Benito we came across a settler, named Jose Leguina, not more than 12 months in his section, which is within forty miles of the San Benito Post Office. He had sunk a shaft in a coal mine, and found some excellent quality of coal, of which he had a sample tested. Since that time he has developed a first-class quicksilver mine, and has concluded a sale of his interest in it to a company of Salinas capitalists for \$5,000 dollars.

NEVADA COUNTY.

RICH STRIKE.—Nevada Transcript, June 4: We understand that Pat Mulligan recently struck a rich gravel claim near a quartz claim owned by him, in the vicinity of South Fork, Eureka township, from which he is taking rich pay. The yield is ½ ounce to the hand. **JOHN SCHMIDT'S MINE.**—June 5: This mine is located on Wood's Ravine, a short distance from this city. The mine has been worked for several years at intervals, and has always yielded large returns for the amount of labor expended, considerable rich specimen rock having been taken out. For several months the mine has been idle for want of drainage. Recently, however, a pump has been put up, and the water taken out of the mine. The ledge was found to be 2 ft. thick, rich in specimen rock and it will yield very large returns. Schmidt and his boys work the mine, and they have taken out lots of gold.

A GOOD LEAD.—June 8: We yesterday saw some pretty good looking rock from a ledge that is being prospecting by Mr. Baldwin in company with the Provision Mining Co. The ledge is situated on Hitchcock Ravine, above Gold Flat, is from 2 to 3 ft. thick, and the rock is well filled with rich sulphurets and galena. The owners are down 30 ft. on the ledge, and Mr. Baldwin informs us that it gets richer and thicker the deeper they go down. About 20 tons of rock is now on the dump pile, which was taken out of the shaft.

SANTA BARBARA COUNTY.

PIRU MINES.—Santa Barbara Index, June 5: The ledges now located are in Rockwood Canyon, the waters of which flow into and form the chief tributary of Piru creek. In the neighborhood of the mines there is an abundant supply of white pine timber; higher up the mountains and not quite so accessible is a fine growth of redwood. The water of Rockwood Creek never fails, the source of supply being springs, and in midsummer the stream will measure 38 to 40 inches—sufficient at all seasons to supply a dozen quartz mills and innumerable arrastra. Rock from Brown's claim, precisely similar to specimens shown us, has yielded \$350 to the ton, in gold and silver, in San Francisco.

SIERRA COUNTY.

GOON PROSPECT.—Downville Messenger, June 7: Sam Hartley has just finished crushing 18 tons of ore from his ledge opposite Clement's bridge. It yielded a return of \$10 per ton. This, however, is not a fair sample of what is in the ore as it carries a large body of sulphurets which contain at least calculation ½ of the gold. Being so heavily charged with sulphurets makes the ore difficult to work and here gold is again lost.

TUOLUMNE COUNTY.

MINE DE VERDI.—Tuolumne Independent, June 7: Capt. Green's ledge, above Columbia, is paying rich. Johnson & Boyer have the contract to sink 100 ft. on the ledge, at, within 12 days, the vein 20 ft. from the surface. It is known as the old Brown ledge, in Bald Mountain, above Phoenix Ditch, Brown's Flat.

WILL PROSPECT.—Five tons of rock from the Golden Gate have been taken to Brown's Flat, to be run through Oliver Cowan's arrastra. **MORE OF IT.**—We are informed that the piece of gold found by Mr. Ogden, last week, at Columbia, was worth \$171.75 instead of \$150 as before stated.

THE RISING SUN. owned by Hill, Marshall & Co. have turned out some good rock from their new chute. Out of 15 tons of rock they realized thirty two ounces—over 2 ounces to the ton.

ANOTHER GOOD VEIN has been found by Ferrier & Reed above Columbia. It is said to be very rich. This is the 3d vein they have found in that vicinity—all prospecting splendidly.

Nevada.

ELY DISTRICT.

POTLAND.—Pioche Record, June 7: About 20 ft. above the bottom of the drift, where the ledge will be struck is the end of the winze in which work was suspended a few weeks since on account of foul air. When the connection with the winze is completed the ventilation will probably be sufficient. There are 60 or 80 ft. of ore exposed in the winze, the assays of which have been satisfactory.

AMADOR TUNNEL.—This mine maintains its reputation for richness of ore and regularity of extent. Good ore is being extracted, and full forces are engaged.

MEADOW VALLEY.—This mine, the recent great strikes in which have attracted so much attention, has continued to improve since our last. The ore-breasts have widened, and the ore is becoming richer. Very little low grade ore has been encountered in the 7th and 8th levels. The quality of the ore is greatly improved, and ore is being extracted in vastly increased amounts.

BROOKLYN.—This is one of the most promising of our new mines. It is situated on the east end of Spring Mountain. The ledge was struck in the main shaft at a depth of 70 ft., from which point a winze has been sunk 30 ft. in ore. The vein matter is from 4 to 5 ft. in width, some of which is rich chloride ore.

EUREKA DISTRICT.

AN IMPORTANT STRIKE.—Eureka Sentinel, June 5: Nat. Diamond during his brief administration as foreman of the Ruby Con. Co.'s mines, has been making things tell. He commenced nearly all the works now, and in most instances from the surface. On the El Dorado, in particular, his well-directed efforts have been crowned with success. A new porphyritic shaft, the depth of 115 ft., a few days ago, cut a splendid 3-ft. ledge, well defined and carrying a fine grade of ore. Preparations are being made for the erection of hoisting works on the Dunderberg. The workings of this mine, having attained a depth of something over 100 ft., it becomes necessary to employ machinery for hoisting purposes. There never has been any question about the richness and extent of the Dunderberg, and it is now looking even better than ever before.

WASHOE.

ARIZONA AND UTAH.—Gold Hill News, June 7: The drift east from the shaft has reached the ledge, and some very good ore reported to be found, the extent of which has not yet been ascertained.

BELCHER.—Daily yield 500 tons from the 4 ore-producing levels, that from the lowest or 1,300-ft. level—about 180 tons per day—being taken out through the Yellow Jacket shaft. The ore stops everywhere continue looking and yielding finely. The main drift south of the 1300-ft. level is in 223 ft. from the Crown Point line, with the face still in good ore. The cross-cut east of the shaft floor, 100 ft. south of the Crown Point line is in 102 ft., with spots of good ore showing in the face. The cross-cut east from the 4th floor, 50 ft. from the Crown Point line, is in 71 ft., the face showing no ore. The main incline is down 163 ft. below the 1,300-ft. level, with the bottom still in dry, hard blasting rock. At 171 ft. it will attain the 1,000-ft. level, having 15 ft. yet to go. A shaft will then be opened for a drift north of the level.

BALTIMORE CO.—The drift north at the upper or 225-ft. level was continued until yesterday, when the air being too bad, further working at this level was suspended until an air blast can be put in. This will be attached to the pump rod. The drift west of the lower or 450-ft. level is being driven ahead in good looking vein matter.

BALTIMORE.—The mill is kept steadily running on ore from the mine. The different ore sections are looking well as usual, with no particular change to note.

CROWN POINT.—Daily yield 500 tons. The ore-breasts and stopes of the 1300-ft. level are looking and yielding finely as usual. Some very good ore streaks are met with in the 8th and 9th floors—cross-cut east. At the 1400-ft. level the best cross-cut from the main south drift is thought to be near the ledge, from the indications of water met with.

CHOLLAR-POTOSI.—Daily yield 100 tons from the old ore sections. Average assay \$32. The main drift north at the 4th or 800-ft. level, is in 528 ft., having about 140 ft. to go in order to connect with the Hale & Norcross mine. It is remembered, in good shape and going ahead.

CON. VIRGINIA.—Sinking the shaft progressing favorably; no water encountered; 3 ft. sunk per day. The 116-ft. level drift from the Gould & Curry, which is to intercept this shaft makes a daily progress of 3½ ft. The drift is being run east of the ledge and direct for the shaft in order to secure ventilation, and is confidently expected to make connection with the shaft by the 15th of August.

OLIVER.—This mine which is just south of the Baltimore, was located in May, 1860, and 2 shafts were sunk on the ledge, one 60 and the other 100 ft. deep, both developing good quartz, which assayed from \$6 to \$8 per ton. Owing to the subsequent and long continued depression of the mining interest, the mine was discontinued until recently. Work is now resumed under excellent auspices. Six men are employed running a drift across the ledge at a depth of 300 ft. The croppings show for a distance of 300 ft., and the rock is very similar to that of the Baltimore.

HALE & NORCROSS.—Daily yield about 80 tons. At the 700-ft. level, 200 ft. west of the main shaft, a drift was driven ahead, and also the south drift, which is now close to the southern boundary, also sinking a winze below the 1,700 or lower level, 40 ft. north of main incline. Another winze is down 46 ft. As yet the cross-cuts have not reached the eastern vein.

IMPERIAL.—The drift at the 1,700-ft. level encounters more quartz above the indications for ore. The sinking of the incline progresses favorably, and everything in and about the mine operates well.

JULIA.—The rock encountered in sinking the shaft is very hard, yet good progress is made. Considerable water is found in the south drift, indicating close proximity to the ore body.

JUSTICE.—Daily yield 90 tons from the old south mine. Drifting in the tunnel and south for connection at the 400-ft. level is progressing well and the cross-cut east, 600 ft. south of the Justice shaft to cut the old Cedar chimney is commenced and making good progress. The incline at the south line is in ore which improves as sunk upon.

CROWN POINT RAVINE.—Drift west from shaft in 175 ft. and for the last few days has been blasting rich ore. This morning there was a change which appears to be favorable to the finding of ore.

DANBY.—New shaft sinking at a good rate of progress. The hoisting-works are being removed to it from the old shaft.

FRANKLIN.—Good progress is made in clearing out and repairing the tunnel, and during the week some very good detached masses of ore has been met with. It will take about 2 weeks longer to reach the ledge.

GOULD & CURRY.—The south drift at the 1000-ft. level is being pushed ahead to form an air connection with the Savage. This is expected to be made in 8 days both companies working with the same object. This connection is of vital importance to the ventilation of both mines. On the 450-ft. level the drifts and cross-cuts to the south and west are exposing a large body of ore, just below milling quality, 90 ft. in width. Putting in new pumps throughout the shaft and discarding the old ones.

GLOBE.—The raise from the tunnel is progressing well, considering the great heat, and shows some good ore spots.

JACOB LITTLE.—Some very good rock is found in the lower tunnel to-day, which gives an average assay of gold \$165; silver \$377; or \$482 to the ton.

KNICKERBOCKER.—Main west drift in 554 ft. from the shaft. The water having decreased considerably, the drift is being driven ahead at a lively rate, 3 light hour shifts being employed. It is now running in porphyry upper level just before the strike of good ore at that point.

MINT.—The main drift in the upper working is in 65 ft., the latter half of which distance it follows the wall of the ledge principally. The face of the drift is working into very favorable looking vein matter, with clay seams. Thirty ft. back from the face of the drift a cross-cut is being made which is now in about 7 ft. in solid rock, which assays from \$16 to \$160 to the ton. The position of the ledge being now pretty well ascertained, work in the main drift at the 75 ft. level will be resumed next week.

NEVADA.—Work goes on in the old works as usual—taking out ore. A strong force of men have been employed during the week grading a road for the purpose of hauling rock to the mill. Sinking the new shaft has been somewhat retarded during the week, on account of putting a new frame over the shaft, which will be finished in a day or two, when sinking will be resumed.

NEW YORK CON.—Water still interferes materially with progress in sinking, yet a ft. a day is made nevertheless.

OPHIR.—Some good-looking quartz is met with in the bottom of the shaft, the sinking of which progresses well.

OVERMAN.—Drifting west progresses at a satisfactory rate, with no change to note. Still in granite and porphyry.

OCCIDENTAL.—Have just completed the crosscut on the northern or extreme end of the tunnel, in which a body of low-grade ore 30 ft. in width is encountered. Now running two other crosscuts back from the cut named above, 250 ft. apart. The northern one has struck into the ore vein. The track in the main tunnel is being repaired, preparatory to an energetic development of the mine.

SAVAGE.—The drift north at the 1,600 ft. level will connect with the south drift from the Gould & Curry in about a week, giving greatly-needed air circulation. The reported richness of the lower levels still continues unabated.

SLAYER HILL.—Daily yield, 50 tons. The ore body in the looking drift is looking finely, and the south drift shows a fine vein, 16 ft. wide. The incline also is giving a good showing of pay ore, and in fact all parts of the mine are looking better than ever. The mill is doing excellent work, and the total bullion receipts for May footed up to nearly \$31,000.

WOODVILLE.—The north portion of the mine at both upper and lower levels still shows finely in the way of good ore. A raise for ventilation purposes is being made from the upper level to the old surface tunnel. It is over 50 ft. up, and in good ore all the way. Some very good ore is also found in the old surface mining tunnel. Both mills are kept steadily running.

YELLOW JACKET.—A drift north is now being made from the main east-drift at the 1,500 ft. level, running in very favorable-looking quartz. The winze is being completed to this level through from the 1,300-ft. level, 300 ft. from the north line, and a drift south from the bottom of it is being run to connect with the drift north, above mentioned. Crosscutting is being done at the 1,400-ft. level, but with no ore developments.

Arizona.

YAVAPAI COUNTY.—Arizona Miner: Jackson & Co. have struck water in the well, and expect to be able to run the mill (a 5-stamp one) and arrastra, night and day. They have succeeded in procuring the pack-trail of Mr. Wm. Simmons, which keeps them supplied with quartz from their claim on the War Eagle ledge. Messrs. McKinnon & Goodwin were running nine arrastra, with horse power, upon ore from the War Eagle. The intention is to construct and run two other arrastra.

The ore from the mine is exceedingly rich in free gold, and some people say, silver. Not long since Mr. Wm. Cole picked up a piece of rock as large as a man's head, pulverized and washed it, after which performance he had left a teaspoonful of pure gold. This piece of ore came from the bottom of a 70-ft. shaft.

Mr. Foster, while gazing on the Tiger dump, had no difficulty in picking up pieces of ore which, he says, were literally covered and veined with native silver. Mr. Davis who has seen all the mines in Wallapai district, and much of the ore which has been extracted from them, has declared to us that the refuse ore which makes the Tiger dump, is the richest pile of ore in this or any other district.

Nearer Prescott, in the old Turkey Creek district, Messrs. Caylor, Hatz and other gentlemen are taking out gold and silver ores, for shipment to San Francisco.

Montana.

GOLD RECEITS.—Montanan, May 29: Since our last issue there has been a fair receipt of gold dust and bullion received at Elling's Banking House from the gulch and the several quartz districts.

Edwards, Jones & Co., gulch mining below Nevada, sent up \$1,500 worth on Sunday, from their first clean-up; 30 ounces came in from the Chiusa diggings on Bunker Dan's Bar; 56 ounces were placed in bank by J. J. of Adobe Hop, Lee & Co. (China), deposited 15 ounces from the Junction diggings, and a small lot of Highland was sent in. This Highland gold, considering the price of gold in New York, brought a handsome price—\$22.25 per ounce.

On Saturday Dr. Alexander sent in a handsome 15-ounce gold brick, the result of a short run on Rising Sun ore, Sterling.

Seventy ounces came up from the Bedford ledge, Meyer & Wilson, at Silver Star, the first of the week, with nothing but the silver-bearing rock.

The Clipper came to market as usual, with 70 ounces, and the Co. tell us we shall hear from them every week after the same style.

Messrs. Porter & Ellis brought up on Monday another evidence of the wealth of Nugget Lode (Silver Star district) in the shape of 75 ounces of the handsomest bullion that has yet been taken from the mine, and report the streak looking better than ever.

A report from Lown's Red Bluff bullion, shipped some time ago, gives a coin value of \$15.69 to the ounce.

GOLD CHECK.—Deer Lodge Independent, May 31: Meagher and Roberts, on the lower end of Bratton's Bar, employ 12 men, and the Pioneer Co. on same lot of 35 men, 12 men play hydraulics and cleaned up \$4,000 last week. Pemberton & Kelley are running one pipe, employ 6 men and have as good ground as any on the Bar. Gibbons & Co. have just started 1 pipe; Ashmead & Allen run 2 pipes on Malden's Bar, employ 11 men, have made 3 clean-ups this spring, the highest amounting to \$2,000. On French gulch Bunker & Co. employ seven men on their bed rock flume, which is paying good wages.

Washington Territory.

RICH QUARTZ.—Walla Walla Union, May 31: During the week Mr. J. D. Cook had an exhibition on a small lot of rich silver-bearing quartz, which he has just brought from the Cœur d'Alene Mountains, where he has been prospecting for a few weeks past. He is now making preparations to return and prospect the mine more thoroughly. He thinks he has struck it rich in the mountains.

FOR THE MINES.—During the week some parties have owned the place, for the different mining camps of Eastern Oregon and Northern Idaho.

Song of the Quartz.

Science taught while I have slumbered,
Heedless of the march of Time;
How in Nature's silent chambers,
Active agents wrought sublime.

How that nameless, subtle gases,
Hardening, moving into place;
Slowly changing and maturing,
Would enrich a future race.

Dawns the era—yes 'tis breaking;
Doubts and doubters disappear;
Stalwart forms from slumber waking,
Rise to bless the pioneer.

Rise to search for indications;
Spur and angle trace with care;
Pierce the granite's stern formation;
Lay the surface croppings bare,

Onward rolls the tide of seekers—
Swifter flies the jarring wheels;
Wealth comes heaving to the movement.
All the force that genius wields.

Jetting stream and glowing furnace,
Rob me of my ancient trust;
Whirling pans in rapid motion,
Grind my fairest forms to dust.

Iron jaws and ponderous stampers,
Draws subsistence from my veins;
Spacious vaults—plethoric pockets,
Groan beneath increasing gains.

I am sovereign here no longer;
Guardian care of wealth is past;
Take my treasures—kept or squandered—
I am broken—crushed at last.

GALVANIC ACTION IN THE EARTH.—An eminent London cutler, Mr. Weiss, having observed that steel seemed to be much improved when it had become rusty in the earth, provided that the rust was not factiously produced by the application of acids, made the experiment of burying some razor blades for nearly three years, and the results fully corresponded to his expectation. The blades became coated with rust, which had the appearance of having exuded from within, but were not corroded, and the quality of the steel was decidedly improved. Analogy led to the conclusion that the same might hold good with respect to iron, under similar circumstances. He accordingly purchased fifteen tons of iron with which the piles of London bridge had been shod. Each shoe consisted of a small inverted pyramid, with four straps, rising from the four sides of the base, which embraced and were nailed to the pile, the total length, from the point which entered the ground to the end of the strap, being about sixteen inches, and the weight about eight pounds. The pyramidal extremities of the shoes were found to be not much corroded, nor indeed were the straps; but the latter had become extremely and beautifully sonorous. When manufactured the solid points in question were convertible into very good steel, also the bolts; but the straps produced steel of unequal quality.

MINING NEAR MEADOW LAKE.—The owners of the U. S. Grant mine, near Meadow Lake, are making active preparations to work the mine the present season. They have an eight-stamp mill ready for business. The ore from the mine is to be roasted and worked by the chlorine process, and arrangements are being made to erect two roasting furnaces as soon as possible. The machinery for these furnaces is being cast at the foundry at Nevada City. There are seven men at work at the mine at present, and the owners have sent below for additional men, and also for teams for hauling supplies, ore, wood, etc. Parties in Truckee who own ledges near the U. S. Grant are also preparing to develop the same, and test the ores at the smelting works in this place. If any cheap process can be found that will successfully extract the gold from the base metal in the ores around Meadow Lake, that once famous mining region will prove to be valuable in reality as it formerly was in imagination. —*Truckee Republican.*

MEXICAN MINES.—In a letter to the *Bulletin*, a correspondent writes from Acapulco as follows concerning the mining interests: The news from the mines of Tascos are very favorable; also those of Sihnatanejo are worked to advantage, and the new gold diggings are yielding handsome returns. General Alvarez has sent a messenger to London for the purpose of forming a large company to work the mines of Guerrero. In the neighboring State of Oajaca the Indians have been troublesome again, and the garrison of Tehuantepec had to be increased to keep them down.

TO REMOVE STAINS BY MACANESSE.—An exchange says:—Put an ounce of manganese into a stone jar, and pour on it some sulphuric acid; expose the stain to the vapor which arises, for a few minutes, and then rinse the article in cold water. Ink, fruit, or other stains, not from grease, are readily removed in this manner; but if care is not used, both the cloth and health will be seriously impaired. Of course only white cloth can be treated, as printed and dyed colors will be removed as well as stains.

NEW PROPELLER.—Reid Brothers, of this city, are about to build a steamer at Port Madison, Puget Sound. She will be 170 feet long, 32 feet beam, and have two decks. She will be a propeller, and will be ready to run by October next.

VENEZUELA.—The mines of Caracolas still continue productive. In the month of March they produced 56,000 marcos of silver, resulting from 28,000 quintals of ore.

Corn and its Varieties.

Among the indigenous grains of the American Continent, Corn—*Zea mays*—stands pre-eminently high, as regards its value to the human family as an article of food. We have many varieties of wild rice, wild oats, wild rye and other native cereals that would go far to sustain life, but none of them can take rank with corn or maize in its now almost numberless varieties. It is this great variety that has caused a doubt with some as to their having originated from anything like a single species.

Doubtless, the mere difference of latitude or length of the growing season, or mode of culture, or quality of soil, have an influence in modifying a single species and be productive of variations from the original type. Be this as it may, we now have varieties that, seem adapted to any phase of climate from the torrid through the entire of the temperate zones of the earth, in any land and country, though unknown to the rest of the world until the discovery of the American Continent by Europeans.

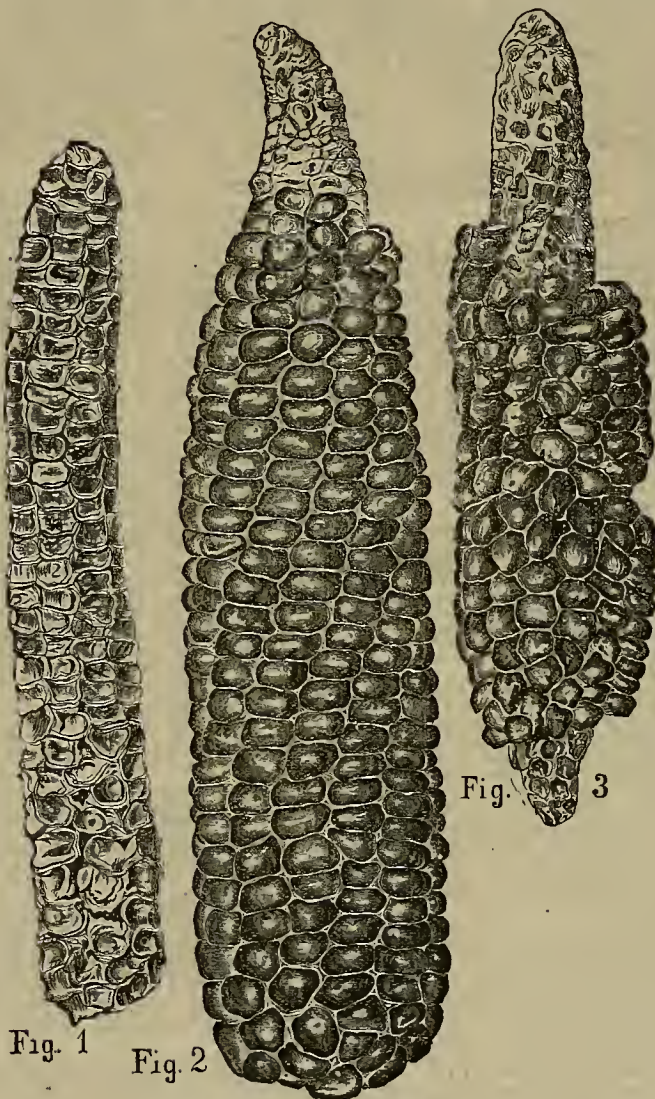
If any proof was wanting that the ancient

spirits hover about them, and therefore will not enter them.

Corn may be said to be the most universal article of food cultivated by the Indians of New Mexico, Arizona, California, Nevada and Utah, while the tribes of the Indian Territory consider this grain their staff of life. The cultivation of corn has not been acquired by them from others. It is a matter of historical record that, when living in the Southern States, long before the white man set foot in the country, it was cultivated, and by nearly all the Indians of the present United States to a greater or less extent.

The Indians who grow it in the primitive manner, and have the original corn of America, are the Pueblos of New Mexico and Arizona. The grains vary in color through shades of pink, blue and white, and the ears are generally rather small and slender. The blue variety, Fig. 2, is preferred for bread, and is sorted from the rest with much care, and stored by itself. The ear has fourteen rows of grains, which are full and plump, and is six and three-quarters long, and four and three-quarters inches around. The corn, after being reduced to meal in a stone mortar, has a peculiar bluish-white appearance.

From these original growths have come the wonderfully varied and interesting varieties



INDIAN CORN. (*Zea mays*)

inhabitants of this continent were the growers of corn, we have the evidence both from North and South America. The Smithsonian Institution has an ear of corn, Fig. 3, of our illustration found deposited in an earthen vessel eleven feet under ground, in a grave with a mummy, near Arignipe, in Peru. The grains are rather sharp-pointed, small, and slightly indented at the apex, lapping one over the other, in thirteen rows. A small portion of this specimen is broken off, hence it is but four and a half inches long. When stationed at Camp Lincoln, Arizona, as post surgeon, the writer explored some ancient rock caves near by, which were plastered in the interior, and obtained several corn-cobs, two of which were preserved, and are now in the museum of the Smithsonian Institution.

One is slender and narrow, Fig. 1, being five and one-quarter inches long; the other is thicker, but its length is only four and one-half inches. The former had ten and the latter eight rows of grains, with no more difference discernable than exists among the corn raised by all the Pueblo Indians of to-day, and which certainly is the kind grown by them at the Spanish conquest of Mexico. The ruins in which the cobs were found have not been inhabited by the present Indians of the country, who are Apaches, as they believe that evil

that now furnish so many of mankind as well as countless lower animals, with a most important and coveted article of food.

MAMMOTH FERRY BOAT.—The Central Pacific Railroad Company will within two months commence the building of a mammoth ferry-boat at Oakland. She is to be about 400 feet in length over all, and is intended to have a double track on which to carry trains across the bay from the Oakland side. The boilers, two in number, have already arrived, and the machinery is being built East. As soon as the lumber arrives from Puget Sound, the building of the boat will be commenced under the superintendence of Captain Foster. Some idea may be formed of her immense size by giving that of some of our large river boats. The "Capital" is 293 feet over all, the "Chrysopolis" about 280 feet, and the new ferry-boat will be nearly the combined length of the "Capital" and the "Corra." The new boat will accommodate about twenty cars—ten on each side. This is double the capacity of the "Thoroughfare," the boat now running.

Four hundred and forty-three tons of quartz were crushed at the North Star mine last month, yielding \$16,000 in gold.

The Germania Works.

The Germania Separating works are situated about seven miles south of Salt Lake City, on the line of the Utah Southern Railroad. The business of this company is to buy base bullion, separate the gold and silver, and make a pure quality of lead; this they are doing successfully. These works are very extensive, substantially built, and in every respect very well arranged. Their present working is a little over forty tons of base bullion per day.

When this company first proposed to establish this business here, it was thought to be a very wild speculation, but so satisfactory have been the results, that it is contemplated in connection with their present business—the manufacturing of white lead—to increase their separating facilities to eighty tons per day. This, we should judge, will demand a further expenditure of about two-thirds the present cost of their works, which cannot be very far from one hundred thousand dollars. We attribute this success, in the main, to the gentlemanly managers, Messrs. Seryar & Billings, and their business capacity, and to Mr. Seryar's thorough understanding of the refining business. Everything, to the observer, seems to be under a rigid discipline. All the different stages of separation impress us as being finished and complete, and every part from the least to the greatest, most carefully attended. We cannot say what the amount of a year's business may be, but it must be very large. At the time of our visit they were melting bullion assaying four hundred and sixty ounces of silver to the ton. We judge, however, the average to be about one hundred and fifty ounces.

It must be gratifying to every man who is at all interested in Utah, to know that every branch of business connected with the mines is being successfully prosecuted, and we take a pleasure in recording a success so complete and promising as that of the Germania. —*Salt Lake Journal.*

PETROLEUM IN CALIFORNIA.—The Los Angeles *Star* suggests the establishment of a petroleum refinery in that town, and makes the following estimate of the expense and profit of producing kerosene from the crude oil, of which considerable supplies are now obtained near San Fernando:

Cost at the deposits for oil, 5 cents per gallon for crude, three of which will make one gallon of refined oil.....	15 cts
Haulage.....	2 1/2
Expenses of refining.....	2 1/2
Containers, tins.....	3
Miscellaneous.....	1

Total expenses per gallon..... 23 cts

Market value..... 40

Net profit..... 17 cts

But the profits of a refinery would not stop here, for there would still be left the unrefined oil, which contains from 16.6 to 31.7 per cent. of lubricating oil, used in machinery, and after this there is a solid residuum.

COAL IN PERU.—A very valuable deposit of coal, pronounced by one of the Government Engineers to be among the best and richest mines on the Pacific Coast, has recently been discovered near Pisco, Peru, and the locomotives on the Ica and Pisco railway are already using the article with great success. The engineer, in his report, states that the coal is finer in quality than any found in Chile, and that the extent of the deposit is very great. Situated close to the sea, near to a perfectly safe harbor, the mine must prove to be very valuable and useful.

THE HOOSAO TUNNEL.—The Massachusetts House of Representatives has appropriated \$200,000 toward the completion of the Hoosao Tunnel, and requested the Governor and Council to report to the next Legislature on the best uses to which it can be applied. The question of State ownership of railroads in Massachusetts is still agitated, but no general policy is agreed upon. The proposition before the Legislature contemplated the State owning one of three competing lines of railroad, all of which were to have the use of the tunnel.

TO CLEAN STEEL PENS.—When a pen has been used until it appears to be spoiled, place it over a flame—a gaslight for instance—for, say, a quarter of a minute, then dip it into water, and it will be again fit for use. A new pen, which is found too hard to write with, will become softer by being thus heated.

SPIEGELISEN is the kind of pig iron used to make Bessemer steel. It is made from magnetic ore, containing 13 per cent. of manganese, with English coke. Spiegelisen is found chiefly in the county of Siegen, Prussia, where fine steel ores are found with a large proportion of manganese. The ores are calcined.

BULLION FROM THE MANHATTAN MILL.—The Manhattan Company shipped during the month of May 103 bars of bullion weighing 10,515 pounds, and valued at \$149,229.25. It was all the product of the mines of this district and was worked at the Manhattan mill. —*Reveille.*

USEFUL INFORMATION.

WONDERS OF NATURE.—It is a wonderful thing to look abroad over the face of nature, and see how every mineral, vegetable and animal production is constituted, so as to minister in some way to the wants of man—to see the vegetable world silently engaged in extracting mineral matters from the soil, and storing them up for the use of man, and man impelled by instinct, selecting these as his own proper food—to behold not only his food and drink flowing constantly to him through the ever revolving cycle of three kingdoms, but even his most valuable ornaments presented through the same natural channel! It is more than wonderful, it is sublime, to view atom from atom of the whole creation unceasingly changed place, that man, the lord of creation, may be abundantly supplied with all his comforts and luxuries; to see the lilies of the field, and the insects of the earth and air, living and dying for man, yielding up their lives for man's sustenance and adornment. True, "the lilies of the field wake no thought for the morrow," but the unseen finger that opens their petals to the day points them out as the appropriate food to some of the animals whose life or death ministers to man! The blooming cactus not only charms the eye of man, and makes the arid desert blossom as the rose, but it furnishes food to an insect that feeds upon it, and grows and dies to clothe man with the same resplendent dye.

ORGANIZED PRODUCTS.—An organized product can appear only from forces of nature which are the movements of the Divine will. A man can arrange, manufacture, weave, forge, adjust, refine; but he cannot organize a nautilus. He can make machines through which the forces of nature play for cunning ends; but he cannot conjure the principles of life into any mould of his own making. He can start shuttles that will weave a carpet for the reception room of a palace in one loom; but he can build no mill, he cannot start no laboratory where the warp and woof of a banana leaf can be plaited. He can tell how the sugar is secreted in the veins of the clover blossom, but he cannot make the clover seed; and we might as well ask the wisest scientific man to fashion a world as to create one of the green needles which a pine tree produces by the million, or one blade of grass. Every organization is of God. The atoms of matter are constantly passing from one organization to another. The great periods of the history of the globe are marked by the appearance of higher organizations, in which material elements and forces are confederated into a nobler unity and broader beneficence. Man is the highest of these organizations, and we exist to be bound together in moral affections, and religious harmonies and unities. In the moral world, as well as in the physical one, organizations are the creations of the Divine Spirit.—*Rev. T. S. King.*

A CEMENT TO STOP FLAWS OR CRACKS IN WOOD OF ANY COLOR.—Put any quantity of fine sawdust of the same wood your work is made with into an earthen-pan, and pour boiling water on it, stir it well, and let it remain for a week or ten days, occasionally stirring it; then boil it for some time, and it will be of the consistence of pulp or paste; put it into a coarse cloth, and squeeze all the moisture from it. Keep for use, and, when wanted, mix a sufficient quantity of thin glue to make it into a paste; rub it well into the cracks, or fill up the holes in your work with it. When quite hard and dry, clean your work off, and, if carefully done, you will scarcely discern the imperfection.

HOW TO REDUCE GAS BILLS.—First—In lighting your gas, turn the gas on the meter about one-half, then light the gas, and regulate the lights by the stop-cock that lets the gas into the meter. This prevents the pressure of gas from making the index move so fast. The greater the pressure of gas on the meter the faster it moves, and the larger the gas bill. Second—From the time the gas is usually lighted until 8½ or 9 o'clock, the pressure is the same. After the stores and shops are closed, the pressure is then greater on the meters in use, and the stop-cock should be turned at the meter so as to regulate the pressure.

TRANSPORTATION OF PETROLEUM MADE SAFE.—It is proposed by Mr. Jordery to render the transportation of petroleum less dangerous by adding an aqueous extract of soap-wart powder, in the proportion of thirty volumes of oil to one volume of soap-wart. The product is consistent and stable. To restore the oil to its original limpidity a few drops of carbolic acid are allowed to drop on the surface, or a large amount of crystallizable acetic acid, when a complete separation follows, the oil floating on the top. The cost would be about \$3 per hundred barrels of petroleum.

ASHBERIUM, a substitute for Britannia metal, invented by Ashberry, of Manchester, consists of eighty parts of tin, fourteen of antimony, two of copper, two of nickel, one of aluminum, and one of zinc. For common articles lead is to be added.

WHITEWASH THAT WILL NOT RUB OFF.—Mix up half a pailful of lime and water; take half a pint of flour and make a starch of it, and pour it into the whitewash while hot. Stir it well, and make it ready for use.

BUILDING BRICK WALLS.—In olden times hard burnt bricks only were used in building houses. The bricks were first saturated with water before being laid in the wall, and when such walls were torn down, the bricks and mortar had to be separated with a sledge or crowbar. But brick walls built in these days, are chiefly made, not of hard bricks, but of what are called stretchers and salmon, or imperfectly burnt bricks, and most commonly brought dry and warm from the kiln, and laid in the wall in that state, with mortar made adhesive by the admixture of loam. When the bricks are laid in the mortar, as quick as a flash they will absorb the mortar and prevent cohesion, inasmuch that the bricks can be separated from the mortar as clean as if they had not been laid in it. Bricks of inferior quality will make a tolerable good wall if dampened and laid in good sharp sand mortar, and whoever wishes to put up a good substantial building, should be careful not to let worm and dusty bricks be heaped in the walls, unless first damped with water.

ECONOMY IN ILLUMINATION.—It is a singular fact in connection with a gas flame, that the power of the light is the same whether the flame is tested edgewise or flatwise. The conclusion arrived at is, that the use of cylindrical glass chimneys with round jets (Argand) is on the whole the most economical.

Mr. Offert states that in bats-wing burners, though the size of the flame diminishes with the amount of gas consumed, it is not in equal ratio. The light of a large flame, for example, may be equivalent to fifteen candles, while that of two small ones together will be only seven or eight candles, though they burn the same amount of gas as the large flame. This is caused by the complete combustion of the gas in the blue zone of the flame, which gives little or no light in either case, and has more favorable circumstances for its occurrence relatively to the size of the flame in the small than in the large flame.

A BULLFROG BAROMETER.—A hotel on the Boston road to Melrose, keeps an ordinary bullfrog in a glass jar, half filled with water. Inside the jar is a diminutive ladder, from the bottom of the vessel to the top. Just above the water line is a perch, on which his frogship in dry weather is to be seen sitting perfectly motionless as long as the dry season lasts. On the slightest indication of a change in the atmosphere, the frog quits his perch and takes to the water, returning to the landing only at long intervals to feed upon the flies that are thrown into the jar. This animated weather-gauge never takes any nourishment except in rainy weather.

GOOD HEALTH.

The Ear and its Treatment.

Let me describe what is probably the most frequent way in which the ear is impaired; that is, by the attempt to clean it. It ought to be understood that the passage of the ear does not require cleaning by us. Nature undertakes the task, and in the healthy state fulfills it perfectly. Her means for cleaning the ear is the wax. Perhaps the reader has never wondered what becomes of the ear-wax. I will tell him. It dries up into thin, fine scales and these peel off, one by one, from the surface of the passage, and fall out imperceptibly, leaving behind them a perfectly clean, smooth surface. In health the passage of the ear is never dirty; but, if we attempt to clean it, we infallibly make it so. Here—by a strange lack of justice, as it would seem, which however, has no doubt a deep justice at the bottom—the best people, those who love cleanliness, suffer most and good and careful nurses do a mischief negligent ones avoid. Washing the ear out with soap and water is bad; it keeps the wax moist when it ought to become dry and scaly, increases its quantity unduly, and makes it absorb the dust with which the air always abounds. But the most hurtful thing is introducing the corner of the towel, screwed up, and twisting it round. This does more harm to the ears than all the other mistakes together. It drives down the wax upon the membrane, much more than it gets it out. Let any one who doubts this make a tube like the passage, especially with the curves which it possesses; let him put a thin membrane at one end, smear the surface with a substance like the ear wax, and then try to get it out by a towel. But this plan does much more mischief than merely pressing down the wax. It irritates the passages, and makes it cast off small flakes of skin, which dry up and become extremely hard, and these are also pressed down upon the membrane. Often it is not only deafness which ensues, but pain and inflammation, and then matter is formed which the hard mass prevents from escaping, and the membrane becomes diseased and worse may follow.

Washing should extend only to the outer surface, as far as the finger can reach. It is a bad practice, also, to put cotton wool soaked in laudanum or chloroform into the ear for the relief of toothache. When a child's ear becomes painful, as it often does, everything should be done to soothe it, and all strong, irritating applications should be avoided. Pieces of hot fig or onion should not be put in, but warm flannels should be applied, with

poppy fomentation, if the pain does not soon subside.

It should be remembered that constantly covering the ear is adapted to injure it. On the whole, men, in whom the ear is habitually exposed, suffer, if anything, less from ear-disease than women, in whom it is so often covered.—*Popular Science Monthly.*

Useful Effects of Light.

Sir James Wylie, late physician to the Emperor of Russia, attentively studied the effects of light as a curative agent in the hospital of St. Petersburg, and he discovered that the number of patients that were cured in rooms properly lighted, was four times those confined in dark rooms. This led to a complete reform in lighting the hospitals of Russia, and with the most beneficial results. In all the cities visited by the cholera, it was universally found that the greatest number of deaths took place in narrow streets, and on the sides of those having a northern exposure, where the salutary beams of the sun were excluded. The inhabitants of the southern slopes of mountains are better developed and more healthy than those who live on the northern sides, while those who dwell in secluded valleys are generally subject to peculiar diseases and deformities of person. These different results are due to the agencies of light, without a full supply of which plants and animals maintain but a sickly and feeble existence. Eminent physicians have observed that partially deformed children have been restored by exposure to the sun and open air. As scrofula is most prevalent among the children of the poor, this is attributed by many persons to their living in dark and confined houses, such diseases being most common among those residing in underground tenements.—*Scientific Artisan.*

MUSCLE AND BRAIN.—Nature is a strict accountant; and if you demand of her in one direction more than she is prepared to lay out, she balances the account by making the deduction elsewhere. If you insist on premature or undue growth of any one part, she will with more or less protest concede the point; but, that she may do your extra work, she must leave none of her more important work undone. In primitive times, when aggression and defense were the leading social activities, bodily vigor, with its accompanying courage, were the great desiderata, and then education was almost wholly physical; mental education was little cared for, and indeed was often treated with contempt. But now that muscular power is of use for little less than manual labor, while social success of nearly every kind depends very much more on mental power, our education has become almost exclusively mental. Instead of respecting the body and ignoring the mind, we now respect the mind and ignore the body. Both these attitudes are wrong. We do not sufficiently realize the truth that, as, in this life of ours, the physical underlies the mental, the mental must not be developed at the expense of the physical. The ancient and modern conception must be combined.

A BATH in hot sand is the latest discovery offered by a therapist of London, as an "infallible cure" for rheumatism. He claims that the advantage of this mode of treatment consists, especially, in the fact that it does not suppress perspiration like the hot water bath, but rather increases it; and another advantage it possesses, is that it does not interfere with the respiration of the patient, as do the steam bath or Turkish bath. It is asserted that the body can endure the influence of such a bath for a much longer time, and a much higher temperature can also be applied. It can be used for infants, and permits of easy application to a part or to the whole body. If this remedy shall prove efficacious for so serious an ailment, it will indeed be a boon to a large class of sufferers.

DIFFERENCE IN MEN.—Two men while walking get well soaked by the rain. One man shakes off the water pretty much as a dog or a duck might do and rather enjoys his shower-bath than not. Another man is taken ill of inflammation of the lungs, and probably dies. The doctors cannot explain the different issues, and they would also be very much puzzled to give a satisfactory account of the pneumonia itself. They will, indeed, generally explain diseases by theories more or less plausible, and practice has been built upon theory, and theory has, no doubt, sacrificed a number of human lives. Yet medicine must have its dogmatic system, and without it medicine becomes little better than empiricism.

M. AERLIN, of Stockholm, places children afflicted with capillary bronchitis or croup in small rooms where there are vessels in which water is kept continually boiling. This treatment, it is stated, if prolonged for days or even weeks, eventually produces a cure. The mortality from the disease in Paris, *Les Mondes* says, has been thus reduced from 48 to 18 per cent.

FRECKLES AND PIMPLES.—A writer in *Rural New Yorker* says, the best way to remove or prevent freckles and pimples is to keep clean; bathe the whole body once a day at least. Eat wholesome food, as little fat pork and greasy food as possible, plenty of fruit, and do not abuse your person.

MISCELLANEOUS.

About Kitchen Work.

The kitchen, in every well-modeled house, should be a large, pleasant, commodious room, for there the good wife is confined from early morn till noon, and generally part of the afternoon. There she works and toils and tires; no one but herself knowing how much she does. The daily round of breakfast, dinner, supper, setting tables, clearing them away, washing dishes, sweeping, etc., etc., is a dull, monotonous life, that she sometimes tires of. But for her there is no reprieve, no putting off or putting by. Every day it must be done. To know how to do her kitchen work thoroughly, easily and well, should be the care of every wife.

The first thing every morning should be the taking care of the milk, if cows are kept, and I take it for granted that nearly all our readers keep one or more cows. If the setting and skimming of the milk can be done before breakfast, much is gained. Everything appertaining to the dairy should be kept with scrupulous neatness. Allow no spilt milk to remain upon the shelves to sour and mold. Wash your pans, pails, strainers, skimmers, ladles and clappers always in warm water, with soap; never use hot water for the first washing.

Keep a nice white cloth to wash the dairy utensils with, not using it to wash other dishes. After washing well in soap and warm water, scald once or twice, and turn them round to dry, or put them in a clean place in the sun, where the sand and dust from the street cannot blow upon them. If you use a wire strainer for milk, it will sometimes get filled up, notwithstanding the utmost care is used. When such is the case, take a tooth brush, which you must keep in a convenient place, and where it will never be used for any other purpose, rub some soap upon it, and clear your strainer by brushing it thoroughly, using warm water. Wash the brush well and dry it before putting it away, that it may keep sweet. This is a much easier way than by scouring with sand, as some do.

The dairy cellar should be small, airy and very clean. The floor should be brick or stone, and nothing should be kept in the cellar but milk and butter. A cellar where pork, fish, vegetables, etc., are kept, is no place for milk. It will not keep sweet; and if the milk is not sweet, the cream certainly cannot be, and therefore the butter is spoiled.

In washing all kinds of dishes, hot water should never be used first. Take warm water, wash your dishes, whether milk or table dishes, all over, then rinse in hot water, wiping dry. A dish cloth should always be made, as much as a dress. Take two pieces of cotton cloth, sew them together on all sides, and you have my idea of a dish cloth, which must be kept nice and sweet and white, never using it for anything but to wash table dishes, scalding it often, and laying out on the grass when convenient. What is more disgusting than to see a woman washing nice white dishes with a little mess of water and a nasty old rag all strung out? I have seen such rags, that I longed to pitch into the stove or pig pen. Have also a nice dish cloth made and put away, to wash your glass and China ware; for the common dish cloth, if ever so good, is not quite good enough for that purpose.

A word about preparing the dishes for washing. Place the large plates at the bottom, the smaller next, and so on. Never put them helter skelter in the sink, and wash them just as they happen to turn up. Let order characterize every step. Mothers, teach your little daughters how to pick up the dishes in order for washing, and they will never forget the lesson.

Never throw the knives, forks, silver spoons, etc., into the bottom of the sink, or in the pan of dish water to soak, till the handles all come off and they are gone. Lay them on a shelf or put them upon a plate, and when washed wet the handles as little as possible, as it spoils them. Always scour your knives once a day at least, and then at noon. By dipping the blade into hot suds before rubbing, they will polish much easier.

Use a wooden tub, in size according to the family, to wash the dishes in, washing it inside and out, and draining at every using.—*Ohio Farmer.*

FISH AS DIET.—Dr. Merryweather says: "A fish diet is a great humanizer of the temper of mankind. Its consumption tends wonderfully to render them more kindly to one another, and consequently tames the passionate disposition to crime. As carnivorous animals are always the most fierce and violent, so become human beings who have carnivorous stomachs. Could such stomachs have an occasional respite by the consumption of fish, the world would be all the better for it. I speak as a medical man, and firmly assert that many maladies would be mitigated, and perhaps annihilated by such a process."

PAPER FOR WARMTH.—A thin shawl may be made warm by folding a newspaper inside of it. The paper is impervious to the wind and cold air from outside, and prevents the rapid escape of the warm air beneath it. If you suffer from cold feet on a journey, fold a piece of newspaper over your stockings; this is better than rubbers. If you are cold in bed, newspapers spread under the upper cover, will serve as an additional blanket.



W. B. EWER.....SENIOR EDITOR

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Saturday Morning, June 14, 1873.
San Francisco:

Legal Tender Rates.—S. F., Thurs., June 12.—buying 85; selling 85½.

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WATER is beginning to get scarce in several places in the placer mining districts, and some of the camps between the Yuba and Deer Creek have already been compelled to shut down. On the ridge beyond the Yuba there is still plenty of water. Big Moore's Flat will probably experience a scarcity by the middle of August.

SUBSCRIBERS, LOOK TO IT!—Every subscriber is requested to see if he is properly credited to the date paid for on the printed label attached to his paper—after paying or renewing his subscriptions. Report at once, if not credited, after paying at the office or to an agent.

DISASTROUS FIRE.—A fire in the freight depot of the Indianapolis and Marietta Railroad at Cincinnati, on the 8th occasioned a loss of \$250,000. About 3,400 barrels of oil, 3,000 feet of walnut lumber, some freight cars and 30 horses were burned.

THE MOOSE MINE, Park county, Colorado, produced about \$330,000 worth of ore in 1872. The Fairplay Sentinel says the mine has a continuous vein of solid mineral 200 feet in length and from two to seven feet wide and is valued at \$2,000,000.

CINNABAR.—A dispatch from Salt Lake states that some of the Indians, of the Colorado Valley, near the Rio Virgin River, are in possession of large amounts of cinnabar. Valuable mines are supposed to be in that vicinity.

PLACER diggings have been discovered in the Cascade range east of Oakland, Oregon. The mines are located on Steamboat and Blue Creeks, tributaries of the North Umpqua.

THE NORTH STAR Consolidated mine, in Star District, Utah, has been sold to parties from Canada.

Is Mining Profitable to Poor Men?

It is very often stated that mining operations are profitable to no one but heavy speculators, and that the small fry have no chance. This may be true of stock speculations, which many people think is all mining amounts to, but is not the case with legitimate mining operations. Of course, a rich man has a better chance to make money than a poor man in any sort of business—what would be the use of being rich if it were otherwise?—but we contend that there is more chance for man without means to make money in this pursuit than in any other. Large fortunes are the exception, all over the world, and the proportion of men who have to work, in one way or another, is immense. This is, of course, necessary and right. When we speak of mining being profitable we do not mean the chances of realizing immense sums of money, but in gaining a competence or a comfortable living as in other classes of business. It is a well known fact that when three or four intelligent men get hold of a good claim, and work it themselves economically and practically, they will make money where a corporation would run heavily in debt. The corporation has too much management—ormismmanagement—and superintendents working other people's property are not so apt to be economical as when a proportion of the expenses come from their own pockets. This fact holds good in other pursuits as well as in mining. We know of many hardworking men now at work in the gravel mines of California or the quartz mines in this and other Pacific States or territories who have claims which yield them a very comfortable living and money to spare for a rainy day. The only trouble is, that the average miner has very crude ideas of economy and thrift, and don't think of the umbrella until it rains.

But how about the people in this city, on salaries, who hear of the rich strikes of men in mining operations and who invest and lose oftener than they make? The answer to that question is, that they didn't invest in mining operations at all; they invested in stocks which they knew nothing about and whose value depended entirely on the manipulations of a few men who, like everybody else, are on the lookout for "number one." This system, generally spoken of as connected with mining alone, pervades everything and everywhere. The few make money; the many lose. The "middle men," bringing the buyer to the seller and knowing something of both sides of the case, are apt to take advantage of that knowledge to their own profit. In the case of mining property the owners generally know more of it than the buyers, who, when they find themselves "bitten," get even by performing the same operation on some other unlucky individual. The large "operators," as they are called, know a good thing as well as anybody, and will not sell a mine for less than it is worth, by any means. The poor fellows who invest their savings in the manner spoken of have our profound sympathy, but they must recollect it is oftener the man they deal with who causes their losses than the mine.

The common miner, he who delves and digs in the bowels of the earth, far from the light of day, tearing the precious metals from their hiding places, with force of muscle and force of powder—are these operations profitable to him? Most assuredly they are. These men must have employment, to support themselves and the families dependent upon them. True, they might find other tasks upon which to expend their energy, but these men gain better wages, generally speaking, than in other pursuits they would be likely to engage in. With the superintendents and foremen to give directions, little intelligence is necessary, and common, unsuited men can do their work as well as those with superior advantages. Skilled labor, as we term it, in a foundry or machine shop, is a necessity; it takes intelligence and experience to carry out these orders; but in a mine, with a pick, gad and drill, a few weeks' work will teach a man to use them well enough to get average wages. With the foremen, etc., it is of course different; they require extensive intelligences and good judgment to do their work properly.

To these common miners, then, mining operations are profitable. By them they make a living and a pretty good one too as the world goes for what we call the "lower classes." The more mines there are the more money there is; the larger the operations the larger the disbursements. In looking over the report of any of our mining companies, it will be seen that the largest outlays are for "labor." Those common miners then get the largest proportion of what is expended. True it comes back again indirectly through the storekeepers and others, into mercantile channels, but the miners had the use of it for their own benefit. Here we have an example. Last week, according to the Green Hill News the miners employed by the Crown Point mine were paid off, and their wages amounted to \$60,000; the Yellow Jacket then received \$13,000 and the Belcher miners got \$70,000. This is an aggregate of \$143,000 distributed by three mines among the laboring men within two days. It ought to make money plenty in that locality.

It must be remembered, however, that there are some 40 other mines on the same lode proper, and hundreds of others in the immediate vicinity; all at work and being developed more or less extensively. Two of these mines, the Crown Point and Belcher, can afford to pay out money for labor for they disburse as divi-

dends this month between them the sum of \$2,040,000; but none of the others are on a dividend paying basis, and the proceeds of the ore in many cases all goes to pay the hands. During the year 1871, the Belcher did not pay any dividends, but paid out \$137,103 for labor alone, while it levied assessments to the amount of \$51,000 and turned out \$1,199,135 in bullion all of which was eaten up as expenses. The Chollar Potosi during the fiscal year ending July, 1872, paid out \$259,000 as dividends and \$164,793 for labor, while the cost of milling the ore was \$431,793.

While we are about it we might as well give a few figures about some of the mines in the Comstock and see who got the most money out of those mines at that time, the poor or the rich men; that is, stockholders or the miner. We will take these at random from several companies' reports:

The Yellow Jacket mine during the fiscal year ending July 1st, 1872, paid for labor \$265,249 and only paid \$120,000 as dividends; crushing and labor at mills cost \$236,943. This loss for that year was \$10,872.

During the year ending July, 1872, the Savage paid out for reduction \$560,361; labor, \$313,232; balance ore drawn, \$132,708. Same mine during year ending July, 1870, paid out \$231,396 for labor, exclusive of labor at mills, and levied \$280,000 assessments.

The Gould & Curry, in 1869, paid out \$135,732 for labor, and levied assessments amounting to \$72,000; this was exclusive of \$11,946 paid as salary to President, clerks, general employee's salary, etc. The same mine in 1870 paid \$48,000 as a dividend, and the labor account was \$229,398.

The Imperial for fiscal year ending May, 1872, levied assessments amounting to \$141,740, and paid out for labor \$134,161.

The Ovsman in 1870 paid no dividends, and paid for labor \$115,868.

The Chollar-Potosi mine in 1869 paid \$41,545 as dividends, and \$238,663 for labor. This same mine in 1872, paid \$252,000 as dividends, and \$164,793 for labor, and \$431,793 for working ore.

The Belcher, during 1871, paid out \$137,103 for labor paid no dividends and levied \$51,925 in assessments. This mine from January 1865 to January 1872, paid \$421,200 as dividends, and it took \$535,600 in assessments besides the production of the mine to do it. That was \$405 per foot of dividends and \$515 per foot of assessments.

The Crown Point mine in 1869 paid out for labor, \$176,726, and levied \$90,000 in assessments. Last year this mining expenses and mining improvements cost, 1,200,906, and the dividends were \$2,180,000, the only case where the stockholders got the best of it.

One California mine quoted as a dividend paying one, the Enreka, paid during the fiscal year ending September 1872, a dividend of \$20,000, and for supplies and labor \$148,433. From October 1865, to October 1872, it paid dividends amounting to \$1,714,000, and expended for labor \$1,381,614.

The figures in all the examples quoted are exclusive of other expenses, many of which employ numbers or men. They do not include timber, lumber, machinery and foundry work, iron, hardware, charcoal, wood, candles, feed hauling, powder, fuse, assays, printing, building materials, all of which items require labor.

Last any body glance over the business and see who has had the best of it and where most of this money circulated. The "poor men" got it and stock sharps paid for a good deal of it. A majority of the mines on the Comstock are now only prospecting so to speak, and do not expect any dividends for some time to come, nevertheless they must have men, and the men must be paid; many of these prospecting mines are pursuing extensive operations, and the money to do it comes out of the pockets of the stockholders, the majority of whom are residents of this city. It may be a pleasant reflection to some of those who revile against San Francisco as playing a "hogging" game, that these little expenses must be paid by them.

If the class of people who invest in such securities were absent, where would the money come from to pursue these operations. They would not be pursued at all or to a limited extent, and many men would be out of employment. It seems to be a chronic complaint among many residents of the interior to run down the "city" as, "gobbling up" all the good things, and monopolizing everything. They seem to forget that San Francisco has had to pay dear for her whistle, and that she has to monopolize all the bad things too. If any money is wanted to develop mining property they come to the city for it, but when the pay dirt comes along, they pitch into the city people for walking off with the profits. This is human nature perhaps, but if isn't justice exactly. If we stand the expenses we ought to reap the profits.

In the case of the Crown Point and Belcher mines they are paying their own expenses and most magnificent dividends also. But just look at the number of other mines, some with excellent prospects, no doubt; but all partially developed and expensive to run, which are now in operation. The rich men—by whom we mean those able to invest—have got to pay these expenses, and the poor men we mean the miners—get the coin. We have spoken of this subject at some length, but we want people to understand that our mining interests are most important to the country, and that the common classes of people with us, are benefitted by the operations carried on, whether profitable to stockholders or not,

The Comstock Mines.—No. VI.

Latest Home Views by our Virginia Correspondent.

A Lookout from a Disinterested Standpoint on the Comstock, between Mines of Merit and what are Termed Wildcats.

In the San Francisco Stock Board the first three calls on this list usually give the cue for each day's operations. For example, as a comparison: Should Ophir discover a body of ore which enhances its value, in the eyes of stock operators, 50 to 100 per cent. in one Board, Gould & Curry and Savage following in the wake, would carry the entire list of leading Comstock miness and wildcats in almost the same proportion. Should the first few stocks called show a weakness, for no reason whatever, when the state of the respective mines is taken into consideration, a universal feeling of distrust, and an uncontrollable depression is manifested, even dividend-paying mines being equally affected, and also mines away down on this list, which, since last Board may have improved 50 per cent. in actual value.

As a body, the Virginia operators being at home, and almost to a man, replete with extensive and valuable information on all mines of interest, buy and sell on the actual merit of their investment.

In San Francisco, the greater number of operators, being a vacillating and excitable class, buy and sell promiscuously. Regarding more the popular feeling in this state of the market than the actual merit of the mines they deal in, they take the first few calls in the Board for the basis of their day's operation, irrespective of what may have been developed in some one of the miness on the latter part of the list.

This may be regarded a prominent reason why so

Many Sudden Collapses

Are almost daily occurring among the more adventurous operators in San Francisco, for it is seldom that a failure occurs in Virginia, except through the recklessness of connections in the Bay City, their business being purely a gambling proposition, in which large operators are constantly subject to annihilation, consequent upon the sudden success or failure of any mine.

To obviate this disporable state of affairs, to insure the actual value of all stocks to be represented in figures on the Stock Board, to concentrate the speculative capital of the country mainly in enterprises of known merit and value, and eventually rule worthless stocks—the miness which they represent being controlled by reckless speculators, whose money alone insures them a place among men, and who, in their insane desire for sudden increase of wealth, have not the patience or enterprise to develop and show to the world the riches which they claim their mines contain, thereby benefitting the whole country as well as themselves; or, in the event of their knowledge and experience, they know them to contain nothing, take advantage of the excitement occasioned by a development in a mine,—which from a combination of snags, capital and perseverance, has given to its managers the reward they merit—to foist their worthless stock on the market, thus victimizing the innocent and confiding who invest their little all in stocks that are cheap, simply because they are cheap, and who, when the excitement subsides awake, to the reality that their hard earnings have gone for valueless paper, the mine which it represents being simply a location, with a ten foot hole on it to preserve its individuality, from the market. Would it not produce a beneficial result to change the present stereotyped form of

Calling Before the Board

Of brokers, and on the principle by which jurors are drawn, place in a box the names of all mines to be called, and, without partiality, and with equal justice to all, commence the list with whichever name is first drawn from the box? In this manner, which changes the programme daily, frivolous speculators would have nothing from which to take their cue.

Wildcat stocks, if valueless, would sell for their actual worth—merely nothing, and eventually sink into obscurity; while old miness of known value, or actively prospecting claims, making developments, would in their turn advance and recede on call according to their merits.

A change of this kind would give justice to all. Crown Point and Belcher, now paying 10 per cent. a month on the market value of their stock, would advance to a price commensurate with their known value and prospect for a continuance of dividends, and other miness such as Sierra Nevada, Silver Hill and Boneye, being in paying condition and out of the reach of assessments, rapidly accumulating funds and with brilliant prospects, would take their representative place among our valuable miness, while enterprising miness such as Ophir, Consolidated Virginia, Gould & Curry, Savage, Hale & Norcross and Chollar, and old Gold Hill miness generally, of established record and of prospective merit would also assume their representative stations, with a certainty of advancement should their developments warrant it.

The miness here, although ateadily pushing ahead in their usual energetic way, seem to come to a standstill as far as items of interest are concerned, nothing new, of especial importance being noticeable in any of them.

CANA,

Virginia, June 10th, 1873.

Parvin's Steam Plow.

We seize with interest upon anything that seems to promise success in this line of steam plowing in which the power is locomotive or self-moving; because it seems to us to be a great necessity upon our wide plains or prairie lands. We must have, if possible, a steam motor, that will start off for a mile or five miles if necessary, with its gang of six or eight plows, and return, doing its work well. Parvin's invention or combination of locomotive and railroad track seems to give promise of being one of the foremost motors for the coming steam plow.

In the last Agricultural Report there is a description, among some eleven other new patents in this line, of Parvin's steam plow. The machine carries and lays its own track in the manner of some road-engines, causing a rotary motion in a horizontal shaft located at or near the hind part of the bed. This shaft is connected by suitable gearing to a driving-wheel suspended beneath the bed of the engine. The driving-wheel, it is understood, does not touch the ground, but is provided with an endless chain, the alternate links of which are made with ridges that mesh into suitable recesses on the periphery of the wheel.

At some distance in front of this driving-wheel is located another wheel of like dimensions and construction, hung in a similar manner. The endless chain referred to also engages with this wheel, so that when steam is applied, the wheels are revolved and the chains travel over them. At regular distances along this chain is placed a series of metal plates, constituting the feet of the machine, and shod with wooden shoes about two inches thick. At each end of this feet is placed a roller of some ten inches diameter, and upon these rollers rest the tracks or ways attached to the under side of the bed of the engine.

Thus it will be seen that the body of the engine rests and moves upon a series of rollers attached to feet, which are automatically raised from the ground, carried forward and deposited again in front, to be passed over regularly. In other words, the machine carries and lays its own track. Its operation is precisely as if a series of rollers were attached to ties laid in a straight line across the field and the engine dragged over them. The only difference is that in this case the ties are chained together and are picked up, carried along and are used continually. The construction will easily be understood by reference to the well-known endless-chain horse-power.

The means used in this case under consideration to propel the carriage consist of just such an endless carrier, arranged to come in contact with the ground—two feet being always on the ground and three off. It ought to be remarked that this principle of propulsion of steam-plows is not for the first time applied. In this case the real novelty, aside from detail, consists in combining the traveling feet with suitable guiding mechanism. This engine is guided by means of two forward wheels mounted on pivoted axles, and so arranged as to be turned right or left at will. The plows, which are of ordinary construction, are connected to the rear part of the machine, and are arranged for the necessary vertical adjustment.

It is said that on the trial in a field near Philadelphia the machine worked well and the experiment was a success. It went a quarter of a mile and back, across a field, with the plows almost up to the beam, at a rate that required rapid walking to keep up with it. The plows are made by the Northwestern Parvin Steam Motor Manufacturing Company, the head office of which is in Chicago and the manufacturing establishment in Farmington.

VERY IMPORTANT IMPROVEMENTS.—The Central Pacific Railroad is now using the Westinghouse Patent Air Brakes, by which an engineer stops a train more gently than can be done by the old system, or brings it to a sudden halt at will. Also, Miller's Patent Platform and Coupling Device, by which the cars are made self-uniting, and are detached by use of a lever, without any danger to the railroad attached. In case of accident they are also self-uncoupling. The Miller Platform is raised to a level with the floor of the car, and being in a straight line with the solid bottom frame of the car prevents the great danger of telescoping—so often happening with cars having the platform a step lower than the car-floor. The adoption of these improvements—which, owing to their great value, are costly patents—is a very great consideration in favor of the traveling public.

Paul's Opinion of Utah.

Our friend, Mr. Paul, having recently made a visit to Utah, called on me the other day and we asked him his opinion of Utah. Here is what he says:

You ask what I think of Utah. I would like to write it up in full, but have not time to do so.

In a geological sense it is a marvel. In a mineralogical one, a wonder. In a political sense, an enigma. In a religious one, a study.

Its products are minerals, fruits, grain, wool and babies.

Within its population are men of the highest and lowest in human intellect. There are physiognomies that would puzzle a Lavater—contour of brains that would form a new field for a Spurzheim. Among the Mormons all is for the Lord and "Bro. Brigham;" among the Gentiles all is for themselves.

As for polygamy, it is the exception. I

who builds up towns, manufactures, telegraphs and railroads almost at a word. In the eyes of the Mormon Church he is next to the Lord. Thousands he has lifted up from abject poverty to comfort, and is it any wonder he is held in reverential awe. The religious love of the true Mormon amounts to an infatuation—a superstition; but many are beginning to look around and think, with a desire for more individual wealth and less religion.

To throw the mind back thirty years, view in retrospect, the barren, inhospitable wilds, and survey this then desert now "blossoming as the rose," with the many, many towns, made self-sustaining and attractive by spacious gardens ornamented with fruit trees of all varieties—a work worthy of imitation by older communities—now happy homes of many a once poor down-trodden European soul.

With all the wrongs and iniquities perpetrated by religious fanaticism, superstitious, and his power, who in America has done so much good for so many. "Let justice be done, etc."

To return to her metals, I will say they are strewn broadcast—of every kind—for

The Vienna Exposition.

[FROM OUR SPECIAL CORRESPONDENT—GUIDO KUSTEL.]

Still raining. Since the last of April up to this day it has been cold, rainy and disagreeable. All the parks and gardens are robbed in luxurious green of the spring, but there is seldom half a day without rain. This unfavorable weather prevents outsiders from coming to Vienna, and the Vienna people from visiting the exposition; nevertheless, the Emperor, Crown Princess, and the other high guests, are almost every day in the industrial palace. Goods are still coming. The work of "fixing up" is progressing in every direction. The agricultural departments, the western half of which is occupied by England, the other half by France, Portugal, Spain, Holland, Italy, Denmark, etc.; and the eastern, belonging to Germany, Austria, Hungary and Russia, are nearly finished. There are a few other private buildings for agriculture and forestry, of great interest, which will be ready in a short time.

Going Through the Main Gallery

Of the industrial palace, one can easily see the practical sense of the English exhibitors, who advertise their goods in the most advantageous way. Most of their articles are advertised in English, French, and German, explaining where necessary, showing the prices not only in pounds and shillings, but often in francs and florins. All other nations use only their own language, generally. Thousands of people are reading the labels of articles every day, without being able to understand them. The practical result of the English mode is quite perceptible—they seem to sell more than the "monolabelers."

One complete exhibit, at least, in the Austrian department, is the

Glassware.

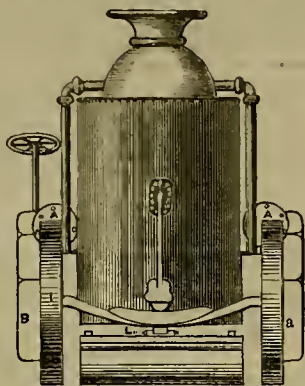
A whole side gallery, and a considerable part of the main gallery, is taken up by Vienna and Bohemian Glass. If one wants to get a true idea of a crystal palace, he must visit the glass exhibition. Hundreds of the most brilliant, large lustres, are hanging over the heads of the people, who admire the splendid play of rainbow colors produced by the large and small cut light-crystals, with which lustres of four to six feet diameter are ornamented in profusion. If lighted by the sunbeams, the colored rays fall on the glassware exhibited on the tables, and one is surprised to see glasses, bottles, etc., in beautiful rainbow colors. There are tables covered with glass for table use, of the very finest crystal glass, cut and engraved in the most delicate and tasteful manner; candelabras, vases, dessert and tea services, bottles for perfumery, pitchers, etc. Some tables show only white glass, with the finest engraving; others red and yellow, blue and green. Of the last color are those of emerald green, very beautiful. The glass gilding is brought to a very high state of perfection, and carried out on white and colored glass in the finest designs, delicate and very tasteful. This Austrian glass industry will probably keep the first rank in the field. There is no French glass exhibited as yet, and only two in the English department. The English glass shows brilliancy and taste, and very fine engraving. There is only one, but a magnificent lustre exhibited. Till now no colored or gilded glass is displayed. The Russian exhibition in this line has nothing remarkable.

The rain stopped this morning; in a few hours the streets were dry, and the exhibition palace was crowded. The art hall was opened to-day by the Emperor, but it is not known as yet when the machinery hall will be declared open, although visitors have had free access from the beginning. The opening will therefore only be formal, while the art hall has been closed only to-day. The Turkish side gallery is now fixed up and open. The Chinese department is barricaded yet, as is that of Morocco, Brazil, and the United States. o. k.

Vienna, May 16, 1873.
[Some other correspondence of Mr. Kustel's, in relation to mining matters, will be found in another column. Eds.]

RAILROAD TRAFFIC.—The Lake Shore and Michigan Southern Railroad Company is said to have given orders for 3,000 additional freight cars, and the New York Central 1,500 cars. The leading railroads are experiencing a car famine, as the car factories are so over-crowded it is impossible to get orders filled. Is not this an indication of prosperity?

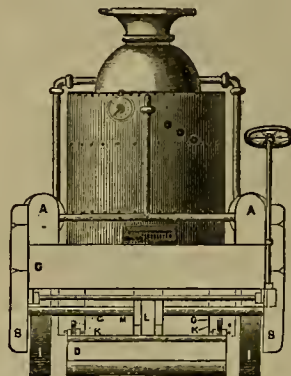
GOLD PLACERS.—The Kalama Beacon announces the discovery of gold placer diggings at the head of Toutle river.



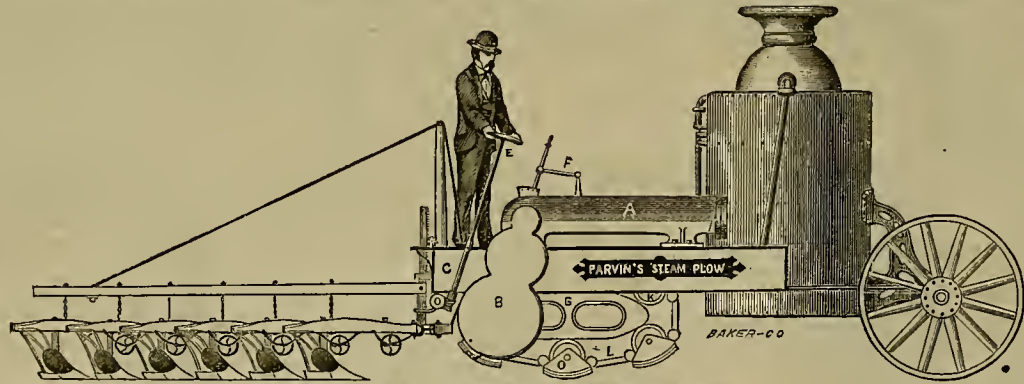
FRONT VIEW.



PROPELLING FEET.



REAR VIEW.



SIDE VIEW OF PARVIN'S STEAM PLOW.

A. Casing or Cover of Engine. B. Gearing Cover. C. Water Tanks and Bed of Engine, as well as the Frame of Machine. D. The Foot or Shoe of Machine. E. Steering Apparatus. F. Reversing Lever. G. Bed or Truck of Engine.

most beautiful inland cities of America.

The press, both Mormon and Gentile, is intellectual, vigorous and enterprising, and will compare with any East, West, North or South.

The Mormons as a whole are industrious, moral, temperate people, and apparently contented with their lot.

I heard President Young, Apostles Taylor, Jos. F. Smith and J. Young, Jr., speak; heard nothing objectionable to God or man, mainly good advice in morals and temperance. Separate co-operation is being pushed for all kinds of business; it is the grand idea of Brigham Young, and is only equalled by the conception, permanency and expansiveness of the Great Temple itself.

This co-operative programme is far reaching, further than many appose. It is a spreading network, whereby the finer and coarser, older and younger elements of Mormon society, are blended into one common interest—one idea, one will. Among his people Brigham Young is the great I am, and his far-seeing brain, broad, spreading conceptions, grasping disposition, and great executive ability entitles him to it. One cannot but admire the awe-inspiring powers of the man who stands as President and Director of 100,000 worshippers in Utah alone: The man

history can repeat itself. The Tabernacle may have the Golden Calf of Aaron; the modern Solomon of many wives can lavishly decorate with gold and silver his Great Temple, and Salt Lake City abound in silver ornaments, as stones in Jerusalem. This is no ideal matter—time will develop it into a fact.

ALMARIN B. PAUL.

GEOLOGICAL EXPLORATIONS.—The Yale College party, with Professor Marsh has started on their western tour, to continue the geological explorations of last year. The party will spend the summer in the Rocky Mountains, the autumn, probably, on the Pacific Coast, and will return to the East in December.

THE GIANT POWDER IMPROVEMENT.—In cheapening the process of mining, we have had no improvement in the last decade greater than that of Giant Powder in places where it has been introduced. At first, slow of introduction, we believe it is now gaining favor rapidly in new places, and holding fast to its old patrons.

RAILROAD SALE.—The Bingham Narrow Gauge Railroad, Utah, has been sold to parties from Pittsburgh, New York and Salt Lake. One of the heaviest stockholders has started for New York to purchase iron and rolling stock.

Manufactures of California.

A correspondent of the *Bulletin* has been reading up the ninth census and extracting from a mass of figures those connected with the manufacturing interests of this State. He says the census of 1870 gives us a clear and pretty reliable basis upon which to ascertain the status of California as a manufacturing State, a claim to which she is eminently entitled. The great manufacturing States, in conspicuous order, are New York, Pennsylvania, Massachusetts, Ohio, Missouri, Illinois, New Jersey and Connecticut. Michigan, Rhode Island and Indiana weigh with great pressure in the grand scales, and Rhode Island, though showing less in figures for the State, and if size were taken into account and her figures correspondingly increased, would be comparatively many times greater than any other State as a seat of manufactures. But California stands, in this line, at the head of a very long list of States. Here is her position by the census of 1870:

State.	Product.	State.	Product.
Maine.....	\$79,491,521	Dist. Columbia	9,292,473
Wisconsin.....	77,214,326	Florida.....	4,685,403
Maryland.....	76,594,613	Kansas.....	11,765,833
N. Hampshire.....	71,035,249	Louisiana.....	24,161,905
California.....	68,584,556	Minnesota.....	23,110,700
Delaware.....	64,625,809	Mississippi.....	8,154,768
Iowa.....	45,534,322	Nebraska.....	5,738,812
Virginia.....	38,364,342	Nevada.....	16,870,539
Tennessee.....	34,362,636	North Carolina.....	19,021,327
Vermont.....	32,184,606	Oregon.....	6,877,337
Georgia.....	31,196,116	South Carolina.....	9,858,981
Arkansas.....	4,629,234	Texas.....	11,617,392
Delaware.....	16,791,382	West Virginia.....	24,102,201

The Lesson.

The lesson from this table is of important bearing. The great ironeries and sawed and log lumber regions, and cotton mills of Maine; the immense sawed lumber, meat-packing and flour interests of Wisconsin; the sugar refineries, clothing-houses, cotton mills, oyster packing, etc., of Maryland, and the pride of the east, those large cotton, woolen and worsted mills, boots and shoes and Yankee notions of New Hampshire do not swell their States' aggregates as much as California. Kentucky, Iowa, Virginia, Tennessee, Vermont, Georgia, Delaware and West Virginia are looked upon as manufacturing States, but Kentucky, with its Louisville, and the great Bourbon whiskey interests of the interior of the State, and the two Virginias together, with their Wheeling and Richmond, are far behind California, while Delaware's great shipbuilding interest is not one-third as important as California's machine and hicksmat shops.

California Industries.

The following tables show in detail and by counties the industries of California as reported by the Commissioners of the Census for 1870:

MECHANICAL AND MANUFACTURING INDUSTRIES.	Establishments.	Hands.	Products.
Agricultural implements.....	10	68	\$118,540
Artificial flowers.....	2	4	5,500
Bags, other than paper.....	1	30	64,200
Baking-powders.....	1	5	64,200
Bellows.....	1	14	64,000
Belt and hose (leather).....	6	44	91,654
Billiard and bagatelle tables and materials.....	453	812	1,161,790
Blacksmithing.....	1	114	1,000
Blackening and dyeing.....	1	114	171,942
Bookbinding.....	1	4	8,560
Boat and shoe findings.....	4.0	1,526	2,214,807
Boots and shoes.....	1	68	70,000
Boxes, cigar.....	4	16	18,000
paper.....	8	195	368,778
wooden.....	1	3	13,500
Brass and copper tubing.....	6	97	114,006
foundry and finishing.....	74	320	1,185,820
Bread, cracker and other bakery products.....	34	610	407,800
Brick.....	13	73	164,885
Brooms and whisk-brushes.....	1	3	6,500
Brushes.....	8	21	207,368
Butchering.....	266	663	1,391,163
Carpentering and building.....	1	4	5,100
Carpets, rag.....	8	640	1,309,443
Carriages and wagons.....	3	80	329,500
Cars, freight and passenger.....	1	8	30,000
Cement.....	2	12	18,239
Charcoal.....	1	4	8,500
Chronos and lithographs.....	108	528	1,090,270
Clothing, men's.....	69	229	738,339
women's.....	13	92	417,716
Coffee and spice, roasted and ground.....	11	34	104,332
Coffins.....	1	12	22,350
Collars and cuffs, paper.....	18	55	269,612
Confectionary.....	61	259	474,444
Cooperage.....	2	7	10,200
Copper, milled and smelted.....	4	16	51,360
Coppersmithing.....	1	162	850,000
Cordage and twine.....	1	2	2,500
Cordials and syrups.....	3	52	63,000
Curled hair.....	4	16	33,775
Cutlery.....	3	6	3,492
and edge tools, (not specified).....	20	24	60,250
Dentistry, mechanical.....	1	4	26,338
Drain-pipe.....	21	190	617,870
Drugs and chemicals.....	10	31	67,000
Engraving.....	3	4	5,000
and metal cutting.....	2	14	37,000
Explosives and fireworks.....	1	1	2,500
Feathers, cleaned, dressed and dyed.....	2	13	20,180
Files.....	2	5	6,900
Fish, cured and packed.....	116	690	9,036,386
Flouring and grist-mill products.....	20	200	200,000
Fruits, canned and preserved.....	48	236	629,762
Furniture (not specified).....	10	240	1,356,753
Gas.....	2	6	13,000
Glass, cut.....	6	90	62,045
Gloves and mittens.....	2	21	78,300
Gins.....	2	35	375,000
Gold and silver, reduced and refined.....	2	12	2,900
Grease and tallow.....	3	7	526,487
Gumamuthing.....	14	24	28,490
Hair-work.....	4	9	11,780
Hand-stamps.....	1	2	3,000
Hardware.....	1	2	1,180
saddlery.....	4	7	12,400
Hats and caps.....	16	62	120,140
Hoop-skirts and corsets.....	3	16	20,277
Instruments, professional and scientific.....	3	6	22,500
Iron, forged and rolled.....	2	129	370,000
bolts, nuts, washers and rivets.....	1	7	15,180
castings, (not specified).....	27	647	1,159,841
stoves, heaters, and belloware.....	4	80	190,120
Ivory work.....	2	3	4,100
Jewelry (not specified).....	29	173	498,780
Lead, pig.....	1	15	200,000
shot.....	1	12	277,000
Leather, tanned.....	43	207	151,045
curried.....	27	65	428,878
Lime.....	1	130	170,050
Liquors, distilled.....	16	75	1,692,207
malt.....	96	389	1,641,174
vinous.....	139	762	602,553
Locksmithing and bellhanging.....	7	18	24,295
Looking-glass and picture frames.....	9	34	161,660
Lumber, planed.....	221	407	1,052,880
sawed.....	291	4,077	5,227,064

MECHANICAL AND MANUFACTURING INDUSTRIES.	Establishments.	Hands.	Products.
Machinery, (not specified).....	29	404	1,622,117
railroad repairing.....	1	80	455,000
steam engines and boilers.....	17	585	1,737,700
Malt.....	4	20	130,800
Marble and stone work, (not specified).....	38	216	332,325
Masonry, brick and stone.....	10	25	30,700
Matchboxes.....	6	65	253,896
Meat, packed pork.....	6	33	253,850
Meters, gas.....	1	6	10,000
Millinery.....	23	83	103,338
Millwrighting.....	4	4	6,773
Mineral and soda waters.....	17	69	217,845
Molasses and syrup (principally sorghum).....	1	4	4,000
sugar, refined.....	3	256	3,904,045
Musical instruments, pianos and materials.....	3	3	10,800
Mustard, ground.....	1	2	1,075
Oil, fish.....	1	5	48,350
lubricating.....	1	2	7,500
Painting.....	42	128	241,400
Paper, (not specified).....	2	26	89,700
Patent medicines and compounds.....	1	3	3,000
pounds.....	2	17	25,700
Patterns and models.....	1	8	9,600
Paving materials.....	1	1	2,000
Pencils and pens, gold.....	1	2	3,400
Perfumery and fancy soaps.....	26	65	86,433
Photographs.....	1	1	900
Pipes, tobacco.....	1	1	560
Plaster, ground.....	1	1	1,900
Plated ware.....	12	44	104,300
Plumbing and gasfitting.....	4	32	83,150
Preserves and cances.....	1	3	700
Printers' fixtures.....	50	549	1,923,446
Printing and publishing, news paper.....	32	299	753,893
Pumps.....	5	12	26,749
Quartz, milled.....	114	676	3,405,778
Quicksilver, smelted.....	4	256	4,027,680
Roofing material.....	2	15	24,053
Saddlery and harness.....	187	693	1,068,452
Safes, doors and vaults, (fire-proof).....	8	64	191,500
Salt.....	8	27	75,671
Ground.....	8	84	48,150
Sash, doors and blinds.....	23	391	787,011
Saws.....	1	36	66,000
Ship building, repairing and ship materials.....	21	82	254,520
Shoes.....	1	10	13,500
Silver ware.....	2	26	92,400
Small beer.....	2	3	3,300
Soap and candles.....	21	80	657,451
Stereotyping and electrotyping.....	1	1	2,200
Stone and earthenware.....	6	17	18,678
Straw goods.....	3	69	60,700
Tin, copper and sheet-iron ware.....	133	368	782,224
Tobacco, chewing, smoking and snuffing.....	3	24	67,800
Cigars.....	88	1,834	1,909,917
Trunks, valises and satchels.....	11	141	280,375
Type-foundry.....	3	57	50,162
Umbrellas and canes.....	1	12	71,000
Upholstery.....	11	42	90,550
Varnish.....	1	2	2,075
Vinegar.....	3	13	61,115
Washing machines and clothes-wringers.....	2	3	6,000
Watch and clock repairing.....	16	16	22,020
Wheelwrighting.....	213	458	655,495
Willow-ware and rustic ornaments.....	2	6	9,300
Wire.....	2	3	9,000
Wire work.....	4	32	142,100
Wood, turned and carved.....	3	6	12,800
Woolen goods.....	5	659	1,102,764
All industries.....	3,984	25,392	\$66,594,556

COUNTIES.	Establishments.	Hands.	Products.
Alameda.....	120	648	1,163,914
Alpine.....	10	20	22,752
Amador.....	7	119	1,686,294
Butte.....	45	286	977,987
Calaveras.....	248	659	606,169
Colusa.....	32	78	252,743
Contra Costa.....	35	63	107,835
Del Norte.....	29	65	203,416
El Dorado.....	62	259	452,876
Fresno.....	35	316	820,272
Humboldt.....	27	104	347,483
Inyo.....	11	71	104,894
Kern.....	8	137	251,419
Klamath.....	22	153	200,290
Lake.....	10	16	22,400
Lassen.....	79	621	728,038
Los Angeles.....	25	336	329,806
Marin.....	18	110	264,236
Mariposa.....	85	876	1,005,464
Mendocino.....	5	13	66,497
Merced.....	8	29	74,825
Mono.....	35	93	197,505
Monterey.....	4	16	139,510
Napa.....	137	597	1,293,809
Nevada.....	68	344	510,606
Placer.....	28	112	340,861
Plumas.....	182	1,159	3,964,616
Sacramento.....	20	104	174,350
San Bernardino.....	6	23	57,807
San Diego.....	1,223	12,377	37,410,829
San Francisco.....	149	455	1,074,897
San Joaquin.....	10	34	97,890
San Luis Obispo.....	78	283	345,258
San Mateo.....	24	105	90,007
Santa Barbara.....	171	761	2,332,809
Santa Clara.....	76	704	1,646,149
Santa Cruz.....	10	119	192,518
Sbasta.....	42	200	574,875
Sierra.....	47	108	247,665
Sliskiyon.....	124	308	811,297
Solano.....	18	954	1,478,433
Stanislaus.....	18	40	218,234
Sutter (a).....	11	141	817,004
Tehama.....	22	60	64,232
Tulare.....	14	80	125,200
Tuolumne.....	25	108	267,085
Yolo.....	103	306	635,158
Yuba.....	114	512	1,337,831
The State.....	3,984	25,392	\$66,594,556

(a) Sutter county is returned as having no manufactures.

Taking the State through we find that San Francisco county is by far the largest producer, Sacramento next, and Santa Clara next. The greatest industry outside of mining, agriculture and railroads in the State is the production of flour, grist, etc., from mills, while sawing lumber, refining sugar, milling quartz and making boots and shoes, are also reported as industries of considerable importance. It must be distinctly understood, in respect to the census, that it was taken for the year commencing June 1, 1869, and ending May 31, 1870.

Largest Manufactured Product.

There have been some disputes as to the importance of various manufactures in the United States. David A. Wells, in his report of 1869, contended that leather and its manufactures was the largest. The census report shows that he was mistaken; according to it the relative rank is as follows:

Whole manufactured product of U. S. \$4,232,345,442

Iron and its manufactures..... 628,303,885

Cotton, Woolen and Worsted Goods..... 611,495,177

Flouring and Grist Mills..... 444,385,143

Leather and Boots and Shoes..... 340,831,727

Lumber..... 252,333,039

Sugar and Molasses..... 119,789,097

Liquors, malt, distilled and vinous..... 94,123,014

Tobacco, Cigars and Snuff..... 71,622,044

As between the products of wool, cotton and leather, the order of precedence is leather products, wool and products, cotton and products, but the exact figures cannot, in the nature of the wool and cotton statistics, be furnished separately for those two items in all their manipulations.

Working Mines vs. Selling Mines.

Like all other mining Territories, we have had an era of selling mines, which, from a Territorial point of view, has not resulted in those benefits to the country which rightfully belong and should accrue to it if the Territorial welfare had been made a matter for consideration.

Although it is reasonable to suppose the past will be repeated at every favorable opportunity, yet it is nevertheless our conviction that the practice of selling mines abroad instead of working them at home and reaping the benefits, is the most prejudicial one to home interests, that is, when conducted in the manner sales have been in the past.

As an illustration of this, we point to almost any of the mines placed on the London market for extravagant sums, and ask to what extent has the business of the country been enhanced beyond the sums received by our own residents, and which have been freely spent in improvements at home, and the amount disbursed by these foreign companies for the extraction of the ores? The bulk of the amounts represented in the sales have certainly gone to those who have no interest in our Territory beyond speculating in our resource, while the actual products of our mines are benefitting not our own residents, but those of some other country. Surely this is not the kind of political economy to make us rich?

If we turn to Nevada, Colorado or other mining Territories, we find that with all their mineral riches their material growth has not been commensurate with their exportations of the precious metals. The reason is obvious, they are owned and speculated upon by those not interested in the country itself, except, to the extent of making money out of it. This being the case it is not a matter for surprise that Nevada with her \$25,000,000 yield of last year, can only show a tithe of that amount in actual home progress and prosperity.

We do not expect that this state of affairs can be entirely obviated in Utah, but we do firmly believe that much better results would follow the inauguration of a system of owning and working mines at home instead of hoarding, selling and disposing of them abroad. That we need capital for development and for the more extensive working of our mines is most apparent, and that it should be invited by every legitimate means is also true, but we think the object should be to invite that class of capital which can see chance enough in Utah to become permanent and resident here. We are hopeful enough to believe that our Territory is now beginning to assume that importance abroad which will influence men of means to unite their destinies with that of Utah.

We have predicted that our mining future will differ in all essential features from that of any of our neighbors, and we have the prediction on the belief that we are entering on an era of mine working by such improved processes as are developed by the experience of our neighbors. We have the wealth here to build up one of the most remarkable States in the Union, the consummation of which will depend greatly on the wisdom used in appropriating it. Working mines with home capital instead of selling them will be found to be a sound doctrine.—S. L. Tribune.

MINING PROSPECTS IN NEW MEXICO.—A gentleman of this city has just received a letter from Socorro, New Mexico, extracts from which we have been permitted to make. They will doubtless interest our readers. The writer says the mines in the vicinity of Silver City have rich ores on the surface but are not of a lasting character; there are or will be more mills than can be supplied with ore. Everybody is in debt to the merchants and there is no money in circulation. A large furnace is to be erected this season by a Chicago company, which may do well for a time. There are large bodies of silver and copper ores from 60 to 100 miles from Silver City, but they cannot be made available until the completion of the Southern Pacific Railroad, which may be five or six years hence. The inhabitants are mostly old Mexicans, and have not yet woken up to realize the future destiny which awaits their country. The advent of railroad communication, together with the infusion of a different element from the influx of the Anglo-Saxon race, will bring about important changes and make the country a profitable field for enterprise.—S. L. Tribune.

BORAX AND ASAPALITUM.—The Commissioner of the General Land Office has decided that asphaltum and borax lands can be taken up for patenting, under the Mineral Land Law of May 10, 1882.

Capital for Development Needed in Utah.

In the present condition of our mining affairs in Utah, says the Salt Lake Tribune, there is no want more keenly felt in some of our districts, and particularly that of Star, in the south, than capital to aid in developing the many mines already opened up, the owners being too depleted in purse to prosecute work to the extent necessary in the development of their property. From all quarters letters come to us in which the writers complain of the lack of capital, and solicit our influence to induce men of means to assist in the great work of opening up mines.

Knowing that, under the present aspect of the various mining markets, it is next to impossible to "place a mine," confidence having already been too much abused, the next best thing to do, and indeed about the only likely thing to accomplish, is to endeavor to secure capital sufficient to aid in opening up mines already discovered throughout the country.

With this object in view, we ask those having money, and who are desirous of investing

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Important to Miners and Mill Men.

Silver-Plated Copper Amalgamating Plates, for Saving Gold.



Of all sizes and in any quantity, furnished to order. Full instructions sent for operating.

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Varney's Patent Amalgamator.

These Machines Stand Unrivaled.

For rapidly pulverizing and amalgamating ores, they have no equal. No effort has been, or will be spared to have them constructed in the most perfect manner and of the great number now in operation, not one has ever required repairs. The constant and increasing demand for them is sufficient evidence of their merits. They are constructed so as to apply steam directly into the pulp, or with steam bottoms, as desired.

This Amalgamator Operates as Follows:

The pan being filled, the motion of the muller forces the pulp to the center, where it is drawn down through the aperture and between the grinding surfaces. Thence it is thrown to the periphery into the quicksilver. The curved plates again draw it to the center, where it passes down, and to the circumference as before. Thus it is constantly passing a regular flow between the grinding surfaces and into the quicksilver, until the ore is reduced to an impalpable powder, and the metal amalgamated.

Settlers made on the same principle excel all others. They bring the pulp so constantly and perfectly in contact with quicksilver, that the particles are rapidly and completely absorbed.

Mill-men are invited to examine these pans and settlers for themselves, at the office, 229 Fremont Street, San Francisco.

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PATENTS & INVENTIONS.

Telegraphic List of U. S. Patents Issued to Pacific Coast Inventors.

FROM OFFICIAL REPORTS FOR THE MINING AND SCIENTIFIC PRESS, DEWEY & CO., PUBLISHERS AND U. S. AND FOREIGN PATENT AGENTS.

By Special Dispatch, Dated Washington, D. C. June 10th, 1873.

FOR WEEK ENDING MAY 27th, 1873.

PAPER CLIP.—M. A. Wheeler, S. F., Cal.

MEDICAL COMPOUND OR OINTMENT.—John G. Hucks, S. F., Cal.

SAW SHARPENING AND SETTING MACHINE.—Edward Duffy, Oakland, Cal.

HARROW.—James F. Gazley, Canyonville, Oregon.

APPARATUS FOR SEPARATING QUICKSILVER FROM AMALGAM.—Marcus B. Howard, Ellsworth, Nevada.

GRAIN RAKE AND LOADER.—George S. Dudley, Dixon, Cal.

MUSICAL INSTRUMENT.—Cameron Maresna, Salt Lake City, Utah.

FEDDER FOR QUARTZ MILLS.—Thomas A. Cochran, Jamestown, Cal.

The patents are not ready for delivery by the Patent Office until some 14 days after the date of issue.

NOTE.—Copies of U. S. and Foreign Patents furnished by Dewey & Co., in the shortest time possible (by telegraph or otherwise) at the lowest rates. All patent business for Pacific coast inventors transacted with greater security and in much less time than by any other agency.

A New Enterprise.

A few weeks ago, while passing up Market street, in this city, our attention was attracted by a crowd of persons in front of 727, next door to Bancroft's building, and upon investigating the cause of the gathering, we found that the Keeler, Hine & Thomas Company, of New York, had opened a store of their beautiful wares in the building, and that this crowd was merely a congregation of eight-seers. We entered the store, and found a large collection of statuary, fountains, vases, aquariums, and a number of other styles and kinds of ornamental goods, which our Coast is greatly in need of. All of these articles are made of metal, and beautifully finished, so as to look either like marble-work or real life, as occasion requires. While examining these articles we could not help picturing to ourself our future palatial residence, which we expect to build, when the PRESS shall have made us wealthy. These two large and beautiful mastiff dogs we will place on either side of the gateway, think we, and this fountain, with the little boy holding the nozzle, will be just this thing to place in the center of the yard. Yes, and how nice it would be to have "Captain Jack and his dog" and place them just in front of the house. The ferocious appearance and threatening position of the noble savage would be a splendid protection from burglars at night and beggars by day. Yes, thought we, we must have "Captain Jack and his dog." Thus we went on theorizing and building air-castles, and furnishing our front yard and spacious grounds, when we were accosted by Capt. J. M. Keeler, the affable gentleman in charge of the store, in whom we recognized an old-time friend. After showing us all of the different styles of ornamental goods, he led, or rather directed, us to a box-shaped arrangement with a long handle sticking out of it. This, said the Captain, is the celebrated Sluthour Pump, formerly known as the Eureka Pump. This latter name attracted our attention, as we had heard of the wonders performed by the Eureka Pump. Upon inquiry, we found the reason why the name was changed was that the world is full of "Eurskes," but was very deficient of "Sluthours." Besides, Mr. Sluthour was the inventor, and the pump is known by that name in the Eastern States. This pump is really a little wonder. It throws more water with less exertion than any other pump we have ever seen. Last fall, when the foundation of the Niantic Hotel, on the corner of Clay and Sansome streets, was being laid, a small pump of this pattern was used to remove and keep out water from the excavation, and during the entire period that it was in use it was surrounded by a large crowd of observers, all of whom expressed their surprise at the remarkable capacity of the pump and the very small amount of power required to operate it. As a farm pump, mining pump, and, in fact, for all uses that a pump can be put to, we consider it a success. The valves are large enough to allow stones, gravel, and any ordinary body that would clog the usual styles of pumps to pass. For this reason it is especially suited as a mining pump. Any person of ordinary mechanical skill can repair it, should it get out of order. From the pump we passed to the Continental Windmill—a new thing in windmills. Besides being quite effective as a windmill, it has the extra attraction of being a model of neatness.

"A thing of beauty is a joy forever," The Continental Windmill, therefore, would be a joy forever. Capt. Keeler is ready to fill all orders for the above goods, and we expect that many of our wealthy citizens will take advantage of the opportunity and relieve the monotony of their lawns by an occasional piece of statuary.

Leather Market Report.

[Reported for the PRESS by Dolliver & Bro.]

SAN FRANCISCO, Wednesday, June 11, 1873.

The demand for Domestic Skins and Sole Leather continues light and old prices. The same may be said in reference to French Skins, except that they have an upward tendency.

City Tanned Leather, # B.	26@29
Santa Cruz Leather, # B.	26@29
Country Leather, # B.	26@29
Stockton Leather, # B.	26@29
Joblot, 8 Kil, per doz.	\$50.00 @ 54.00
Joblot, 11 to 15 Kil, per doz.	68.00 @ 70.00
Joblot, 16 to 20 Kil, per doz.	70.00 @ 72.00
Joblot, 21 to 25 Kil, per doz.	72.00 @ 74.00
Joblot, 26 to 30 Kil, per doz.	74.00 @ 76.00
Joblot, 31 to 35 Kil, per doz.	76.00 @ 78.00
Joblot, 36 to 40 Kil, per doz.	78.00 @ 80.00
Joblot, 41 to 45 Kil, per doz.	80.00 @ 82.00
Joblot, 46 to 50 Kil, per doz.	82.00 @ 84.00
Joblot, 51 to 55 Kil, per doz.	84.00 @ 86.00
Joblot, 56 to 60 Kil, per doz.	86.00 @ 88.00
Joblot, 61 to 65 Kil, per doz.	88.00 @ 90.00
Joblot, 66 to 70 Kil, per doz.	90.00 @ 92.00
Joblot, 71 to 75 Kil, per doz.	92.00 @ 94.00
Joblot, 76 to 80 Kil, per doz.	94.00 @ 96.00
Joblot, 81 to 85 Kil, per doz.	96.00 @ 98.00
Joblot, 86 to 90 Kil, per doz.	98.00 @ 100.00
Joblot, 91 to 95 Kil, per doz.	100.00 @ 102.00
Joblot, 96 to 100 Kil, per doz.	102.00 @ 104.00
Joblot, 101 to 105 Kil, per doz.	104.00 @ 106.00
Joblot, 106 to 110 Kil, per doz.	106.00 @ 108.00
Joblot, 111 to 115 Kil, per doz.	108.00 @ 110.00
Joblot, 116 to 120 Kil, per doz.	110.00 @ 112.00
Joblot, 121 to 125 Kil, per doz.	112.00 @ 114.00
Joblot, 126 to 130 Kil, per doz.	114.00 @ 116.00
Joblot, 131 to 135 Kil, per doz.	116.00 @ 118.00
Joblot, 136 to 140 Kil, per doz.	118.00 @ 120.00
Joblot, 141 to 145 Kil, per doz.	120.00 @ 122.00
Joblot, 146 to 150 Kil, per doz.	122.00 @ 124.00
Joblot, 151 to 155 Kil, per doz.	124.00 @ 126.00
Joblot, 156 to 160 Kil, per doz.	126.00 @ 128.00
Joblot, 161 to 165 Kil, per doz.	128.00 @ 130.00
Joblot, 166 to 170 Kil, per doz.	130.00 @ 132.00
Joblot, 171 to 175 Kil, per doz.	132.00 @ 134.00
Joblot, 176 to 180 Kil, per doz.	134.00 @ 136.00
Joblot, 181 to 185 Kil, per doz.	136.00 @ 138.00
Joblot, 186 to 190 Kil, per doz.	138.00 @ 140.00
Joblot, 191 to 195 Kil, per doz.	140.00 @ 142.00
Joblot, 196 to 200 Kil, per doz.	142.00 @ 144.00
Joblot, 201 to 205 Kil, per doz.	144.00 @ 146.00
Joblot, 206 to 210 Kil, per doz.	146.00 @ 148.00
Joblot, 211 to 215 Kil, per doz.	148.00 @ 150.00
Joblot, 216 to 220 Kil, per doz.	150.00 @ 152.00
Joblot, 221 to 225 Kil, per doz.	152.00 @ 154.00
Joblot, 226 to 230 Kil, per doz.	154.00 @ 156.00
Joblot, 231 to 235 Kil, per doz.	156.00 @ 158.00
Joblot, 236 to 240 Kil, per doz.	158.00 @ 160.00
Joblot, 241 to 245 Kil, per doz.	160.00 @ 162.00
Joblot, 246 to 250 Kil, per doz.	162.00 @ 164.00
Joblot, 251 to 255 Kil, per doz.	164.00 @ 166.00
Joblot, 256 to 260 Kil, per doz.	166.00 @ 168.00
Joblot, 261 to 265 Kil, per doz.	168.00 @ 170.00
Joblot, 266 to 270 Kil, per doz.	170.00 @ 172.00
Joblot, 271 to 275 Kil, per doz.	172.00 @ 174.00
Joblot, 276 to 280 Kil, per doz.	174.00 @ 176.00
Joblot, 281 to 285 Kil, per doz.	176.00 @ 178.00
Joblot, 286 to 290 Kil, per doz.	178.00 @ 180.00
Joblot, 291 to 295 Kil, per doz.	180.00 @ 182.00
Joblot, 296 to 300 Kil, per doz.	182.00 @ 184.00
Joblot, 301 to 305 Kil, per doz.	184.00 @ 186.00
Joblot, 306 to 310 Kil, per doz.	186.00 @ 188.00
Joblot, 311 to 315 Kil, per doz.	188.00 @ 190.00
Joblot, 316 to 320 Kil, per doz.	190.00 @ 192.00
Joblot, 321 to 325 Kil, per doz.	192.00 @ 194.00
Joblot, 326 to 330 Kil, per doz.	194.00 @ 196.00
Joblot, 331 to 335 Kil, per doz.	196.00 @ 198.00
Joblot, 336 to 340 Kil, per doz.	198.00 @ 200.00
Joblot, 341 to 345 Kil, per doz.	200.00 @ 202.00
Joblot, 346 to 350 Kil, per doz.	202.00 @ 204.00
Joblot, 351 to 355 Kil, per doz.	204.00 @ 206.00
Joblot, 356 to 360 Kil, per doz.	206.00 @ 208.00
Joblot, 361 to 365 Kil, per doz.	208.00 @ 210.00
Joblot, 366 to 370 Kil, per doz.	210.00 @ 212.00
Joblot, 371 to 375 Kil, per doz.	212.00 @ 214.00
Joblot, 376 to 380 Kil, per doz.	214.00 @ 216.00
Joblot, 381 to 385 Kil, per doz.	216.00 @ 218.00
Joblot, 386 to 390 Kil, per doz.	218.00 @ 220.00
Joblot, 391 to 395 Kil, per doz.	220.00 @ 222.00
Joblot, 396 to 400 Kil, per doz.	222.00 @ 224.00
Joblot, 401 to 405 Kil, per doz.	224.00 @ 226.00
Joblot, 406 to 410 Kil, per doz.	226.00 @ 228.00
Joblot, 411 to 415 Kil, per doz.	228.00 @ 230.00
Joblot, 416 to 420 Kil, per doz.	230.00 @ 232.00
Joblot, 421 to 425 Kil, per doz.	232.00 @ 234.00
Joblot, 426 to 430 Kil, per doz.	234.00 @ 236.00
Joblot, 431 to 435 Kil, per doz.	236.00 @ 238.00
Joblot, 436 to 440 Kil, per doz.	238.00 @ 240.00
Joblot, 441 to 445 Kil, per doz.	240.00 @ 242.00
Joblot, 446 to 450 Kil, per doz.	242.00 @ 244.00
Joblot, 451 to 455 Kil, per doz.	244.00 @ 246.00
Joblot, 456 to 460 Kil, per doz.	246.00 @ 248.00
Joblot, 461 to 465 Kil, per doz.	248.00 @ 250.00
Joblot, 466 to 470 Kil, per doz.	250.00 @ 252.00
Joblot, 471 to 475 Kil, per doz.	252.00 @ 254.00
Joblot, 476 to 480 Kil, per doz.	254.00 @ 256.00
Joblot, 481 to 485 Kil, per doz.	256.00 @ 258.00
Joblot, 486 to 490 Kil, per doz.	258.00 @ 260.00
Joblot, 491 to 495 Kil, per doz.	260.00 @ 262.00
Joblot, 496 to 500 Kil, per doz.	262.00 @ 264.00
Joblot, 501 to 505 Kil, per doz.	264.00 @ 266.00
Joblot, 506 to 510 Kil, per doz.	266.00 @ 268.00
Joblot, 511 to 515 Kil, per doz.	268.00 @ 270.00
Joblot, 516 to 520 Kil, per doz.	270.00 @ 272.00
Joblot, 521 to 525 Kil, per doz.	272.00 @ 274.00
Joblot, 526 to 530 Kil, per doz.	274.00 @ 276.00
Joblot, 531 to 535 Kil, per doz.	276.00 @ 278.00
Joblot, 536 to 540 Kil, per doz.	278.00 @ 280.00
Joblot, 541 to 545 Kil, per doz.	280.00 @ 282.00
Joblot, 546 to 550 Kil, per doz.	282.00 @ 284.00
Joblot, 551 to 555 Kil, per doz.	284.00 @ 286.00
Joblot, 556 to 560 Kil, per doz.	286.00 @ 288.00
Joblot, 561 to 565 Kil, per doz.	288.00 @ 290.00
Joblot, 566 to 570 Kil, per doz.	290.00 @ 292.00
Joblot, 571 to 575 Kil, per doz.	292.00 @ 294.00
Joblot, 576 to 580 Kil, per doz.	294.00 @ 296.00
Joblot, 581 to 585 Kil, per doz.	296.00 @ 298.00
Joblot, 586 to 590 Kil, per doz.	298.00 @ 300.00
Joblot, 591 to 595 Kil, per doz.	300.00 @ 302.00
Joblot, 596 to 600 Kil, per doz.	302.00 @ 304.00
Joblot, 601 to 605 Kil, per doz.	304.00 @ 306.00
Joblot, 606 to 610 Kil, per doz.	306.00 @ 308.00
Joblot, 611 to 615 Kil, per doz.	308.00 @ 310.00
Joblot, 616 to 620 Kil, per doz.	310.00 @ 312.00
Joblot, 621 to 625 Kil, per doz.	312.00 @ 314.00
Joblot, 626 to 630 Kil, per doz.	314.00 @ 316.00
Joblot, 631 to 635 Kil, per doz.	316.00 @ 318.00
Joblot, 636 to 640 Kil, per doz.	318.00 @ 320.00
Joblot, 641 to 645 Kil, per doz.	320.00 @ 322.00
Joblot, 646 to 650 Kil, per doz.	322.00 @ 324.00
Joblot, 651 to 655 Kil, per doz.	324.00 @ 326.00
Joblot, 656 to 660 Kil, per doz.	326.00 @ 328.00
Joblot, 661 to 665 Kil, per doz.	328.00 @ 330.00
Joblot, 666 to 670 Kil, per doz.	330.00 @ 332.00
Joblot, 671 to 675 Kil, per doz.	332.00 @ 334.00
Joblot, 676 to 680 Kil, per doz.	334.00 @ 336.00
Joblot, 681 to 685 Kil, per doz.	336.00 @ 338.00
Joblot, 686 to 690 Kil, per doz.	338.00 @ 340.00
Joblot, 691 to 695 Kil, per doz.	340.00 @ 342.00
Joblot, 696 to 700 Kil, per doz.	342.00 @ 344.00
Joblot, 701 to 705 Kil, per doz.	344.00 @ 346.00
Joblot, 706 to 710 Kil, per doz.	346.00 @ 348.00
Joblot, 711 to 715 Kil, per doz.	348.00 @ 350.00
Joblot, 716 to 720 Kil, per doz.	350.00 @ 352.00
Joblot, 721 to 725 Kil, per doz.	352.00 @ 354.00
Joblot, 726 to 730 Kil, per doz.	354.00 @ 356.00
Joblot, 731 to 735 Kil, per doz.	356.00 @ 358.00
Joblot, 736 to 740 Kil, per doz.	358.00 @ 360.00
Joblot, 741 to 745 Kil, per doz.	360.00 @ 362.00
Joblot, 746 to 750 Kil, per doz.	362.00 @ 364.00
Joblot, 751 to 755 Kil, per doz.	364.00 @ 366.00
Joblot, 756 to 760 Kil, per doz.	366.00 @ 368.00
Joblot, 761 to 765 Kil, per doz.	368.00 @ 370.00
Joblot, 766 to 770 Kil, per doz.	370.00 @ 372.00
Joblot, 771 to 775 Kil, per doz.	372.00 @ 374.00
Joblot, 776 to 780 Kil, per doz.	374.00 @ 376.00
Joblot, 781 to 785 Kil, per doz.	376.00 @ 378.00
Joblot, 786 to 790 Kil, per doz.	378.00 @ 380.00
Joblot, 791 to 795 Kil, per doz.	380.00 @ 382.00
Joblot, 796 to 800 Kil, per doz.	382.00 @ 384.00
Joblot, 801 to 805 Kil, per doz.	384.00 @ 386.00
Joblot, 806 to 810 Kil, per doz.	386.00 @ 388.00
Joblot, 811 to 815 Kil, per doz.	388.00 @ 390.00
Joblot, 816 to 820 Kil, per doz.	390.00 @ 392.00
Joblot, 821 to 825 Kil, per doz.	392.00 @ 394.00
Joblot, 826 to 830 Kil, per doz.	394.00 @ 396.00
Joblot, 831 to 835 Kil, per doz.	396.00 @ 398.00
Joblot, 836 to 840 Kil, per doz.	398.00 @ 400.00
Joblot, 841 to 845 Kil, per doz.	400.00 @ 402.00
Joblot, 846 to 850 Kil, per doz.	402.00 @ 404.00
Joblot, 851 to 855 Kil, per doz.	404.00 @ 406.00
Joblot, 856 to 860 Kil, per doz.	406.00 @ 408.00
Joblot, 861 to 865 Kil, per doz.	408.00 @ 410.00
Joblot, 866 to 870 Kil, per doz.	410.00 @ 412.00
Joblot, 871 to 875 Kil, per doz.	412.00 @ 414.00
Joblot, 876 to 880 Kil, per doz.	414.00 @ 416.00
Joblot, 881 to 885 Kil, per doz.	416.00 @ 418.00
Joblot, 886 to 890 Kil, per doz.	418.00 @ 420.00
Joblot, 891 to 895 Kil, per doz.	420.00 @ 422.00
Joblot, 896 to 900 Kil, per doz.	422.00 @ 424.00
Joblot, 901 to 905 Kil, per doz.	424.00 @ 426.00
Joblot, 906 to 910 Kil, per doz.	426.00 @ 428.00
Joblot, 911 to 915 Kil, per doz.	428.00 @ 430.00
Joblot, 916 to 920 Kil, per doz.	430.00 @ 432.00
Joblot, 921 to 925 Kil, per doz.	432.00 @ 434.00
Joblot, 926 to 930 Kil, per doz.	434.00 @ 436.00
Joblot, 931 to 935 Kil, per doz.	436.00 @ 438.00
Joblot, 936 to 940 Kil, per doz.	438.00 @ 440.00
Joblot, 941 to 945 Kil, per doz.	440.00 @ 442.00
Joblot, 946 to 950 Kil, per doz.	442.00 @ 444.00
Joblot, 951 to 955 Kil, per doz.	444.00 @ 446.00
Joblot, 956 to 960 Kil, per doz.	446.00 @ 448.00
Joblot, 961 to 965 Kil, per doz.	448.00 @ 450.00
Joblot, 966 to 970 Kil, per doz.	450.00 @ 452.00
Joblot, 971 to 975 Kil, per doz.	452.00 @ 454.00
Joblot, 976 to 980 Kil, per doz.	454.00 @ 456.00
Joblot, 981 to 985 Kil, per doz.	456.00 @ 458.00
Joblot, 986 to 990 Kil, per doz.	458.00 @ 460.00
Joblot, 991 to 995 Kil, per doz.	460.00 @ 462.00
Joblot, 996 to 1000 Kil, per doz.	462.00 @ 464.00

San Francisco Metal Market.

WEDNESDAY, June 11, 1873.

Iron—	
Scotch Pig Iron, # ton.	\$52.00 @ 56.00
White Pig, # ton.	52.00 @ 55.00
Refined Bar, good assortment, # B.	— @ —
Boiler, No. 1 to 4.	— @ —
Plate, No. 5 to 8.	— @ —
Sheet, No. 10 to 12.	— @ —
Sheet, No. 14 to 20.	— @ —
Sheet, No. 24 to 28.	— @ —
Sheet, No. 30 to 36.	— @ —

Ida and Rhoda Lewis Consolidated Mining Company--ANNUAL MEETING.
The annual meeting of stockholders of the Ida and Rhoda Lewis Consolidated Mining Company, for the election of Directors and transaction of such business as may be presented, will be held on Tuesday, June 17th, at 1 o'clock p. m., at the office of the Company, No. 10 Webb street, San Francisco, California.
J. DE STA MARINA, President.
A. O. MORSE, Secretary.
San Francisco, May 19, 1873. m19-td

Mazepa Silver Mining Company--Location of works, Ely Mining District, Lincoln County, State of Nevada. Principal place of business, San Francisco, Cal.
Notice is hereby given, that at a meeting of the Directors, held on the 20th day of May, 1873, an assessment (No. 1) of Fifty Cents per share was levied upon the capital stock of the Corporation, payable immediately, in United States gold coin, to the Secretary, at the office of the Company, No. 22 Sansome street, San Francisco, California. Any stock upon which this assessment shall remain unpaid on the 24th day of June, 1873, will be delinquent and advertised for sale at public auction, and unless payment is made before, will be sold on Tuesday, the 15th day of July, 1873, to pay the delinquent assessment, together with costs of advertising and expenses of sale.
M. F. GAMIE, Secretary.
Office, No. 22 Sansome street, San Francisco, Cal. m26

Newton Booth Consolidated Mining Company--Location of principal place of business, San Francisco, California. Location of works, Ely Mining District, Lincoln County, Nevada.
Notice--There are delinquent upon the following described stock, on account of assessment levied on the seventh day of May, 1873, the several amounts set opposite the names of the respective shareholders, as follows:

Names.	No. Certificate.	No. Shares.	Amount.
T Campbell, Trustee.....	14	100	\$30 00
T Campbell, Trustee.....	15	100	50 00
T Campbell, Trustee.....	16	100	50 00
T Campbell, Trustee.....	17	100	50 00
T Campbell, Trustee.....	18	100	50 00
T Campbell, Trustee.....	19	100	50 00
T Campbell, Trustee.....	20	100	50 00
T Campbell, Trustee.....	21	100	50 00
T Campbell, Trustee.....	22	100	50 00
T Campbell, Trustee.....	23	100	50 00
T Campbell, Trustee.....	24	100	50 00
T Campbell, Trustee.....	25	100	50 00
T Campbell, Trustee.....	26	100	50 00
T Campbell, Trustee.....	27	100	50 00
T Campbell, Trustee.....	28	100	50 00
T Campbell, Trustee.....	29	100	50 00
T Campbell, Trustee.....	30	100	50 00
T Campbell, Trustee.....	31	100	50 00
T Campbell, Trustee.....	32	100	50 00
T Campbell, Trustee.....	33	100	50 00
T Campbell, Trustee.....	34	100	50 00
T Campbell, Trustee.....	35	100	50 00
T Campbell, Trustee.....	36	100	50 00
T Campbell, Trustee.....	37	100	50 00
T Campbell, Trustee.....	38	100	50 00
T Campbell, Trustee.....	39	100	50 00
T Campbell, Trustee.....	40	100	50 00
J T Babcock.....	41	50	25 00
J T Babcock.....	42	25	12 50
J T Babcock.....	43	25	12 50
T Campbell.....	44	50	25 00
T Campbell.....	45	50	25 00
T Campbell.....	46	50	25 00
T Campbell.....	47	50	25 00
T Campbell.....	48	50	25 00
T Campbell.....	49	50	25 00
T Campbell.....	50	50	25 00
T Campbell.....	51	50	25 00
T Campbell.....	52	50	25 00
T Campbell.....	53	50	25 00
T Campbell.....	54	50	25 00
T Campbell.....	55	50	25 00
T Campbell.....	56	25	12 50
T Campbell.....	57	25	12 50
T Campbell.....	58	25	12 50
T Campbell.....	59	50	25 00
T Campbell.....	60	100	50 00
T Campbell.....	61	100	50 00
T Campbell.....	62	100	50 00
T Campbell.....	63	100	50 00
T Campbell.....	64	100	50 00
T Campbell.....	65	100	50 00
T Campbell.....	66	100	50 00
T Campbell.....	67	100	50 00
T Campbell.....	68	100	50 00
T Campbell.....	69	100	50 00
T Campbell.....	70	100	50 00
T Campbell.....	71	100	50 00
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T Campbell.....	73	100	50 00
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T Campbell.....	80	50	25 00
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T Campbell.....	99	100	50 00
T Campbell.....	100	100	50 00
T Campbell.....	101	100	50 00
T Campbell.....	102	100	50 00
T Campbell.....	103	100	50 00
T Campbell.....	104	100	50 00
T Campbell.....	105	100	50 00
T Campbell.....	106	100	50 00
T Campbell.....	107	100	50 00
T Campbell.....	108	100	50 00
J G Cullen.....	113	44	22 00
O H Lagrange.....	114	434	217 00
O T Hutchinson.....	116	434	217 00
N Hamilton.....	117	217	108 50
H Rutherford.....	118	217	108 50
O T Hutchinson.....	121	600	300 00
O T Hutchinson.....	122	600	300 00
O T Hutchinson.....	123	60	30 00
J T Babcock.....	124	50	25 00
James L DuBois.....	125	100	50 00
Mrs T W Scott.....	126	100	50 00
Frank Clarke.....	127	50	25 00
S T Raymond.....	128	12	6 00
T W Scott.....	129	50	25 00
S F Elliott.....	131	100	50 00
W P Voss.....	132	50	25 00
T Campbell.....	133	50	25 00
M Winante.....	135	100	50 00
T Campbell, Trustee.....	137	100	50 00
A H Campbell.....	138	300	150 00
T Campbell, Trustee.....	139	200	100 00
O C Miller.....	140	109	54 50
Robt F Scott, Trustee.....	141	1500	750 00
T Campbell.....	142	144	72 00
O T Hutchinson.....	144	500	250 00
James W Wright.....	145	100	50 00
James W Wright.....	146	100	50 00
James W Wright.....	147	100	50 00
James W Wright.....	148	100	50 00
James W Wright.....	149	100	50 00
James W Wright.....	150	100	50 00
James W Wright.....	151	100	50 00
James W Wright.....	152	100	50 00
James W Wright.....	153	100	50 00
James W Wright.....	154	100	50 00
James W Wright.....	155	100	50 00
James W Wright.....	156	100	50 00
James W Wright.....	157	100	50 00

Names.	No. Certificate.	No. Shares.	Amount.
James W Wright.....	158	100	50 00
James W Wright.....	159	100	50 00
T Campbell.....	160	135	67 50
T Campbell.....	161	200	100 00
W H Henderson.....	164	1000	500 00
B Herrinhl.....	165	100	50 00
B Herrinhl.....	167	100	50 00
B Herrinhl.....	168	100	50 00
B Herrinhl, Trustee.....	169	350	175 00
B F Sherwood & Co., Trustees.....	170	800	250 00
B F Sherwood & Co., Trustees.....	171	200	100 00
B F Sherwood & Co., Trustees.....	172	800	250 00
B F Sherwood & Co., Trustees.....	173	500	250 00
B F Sherwood & Co., Trustees.....	174	100	50 00
B F Sherwood & Co., Trustees.....	175	100	50 00
B F Sherwood & Co., Trustees.....	176	100	50 00
B F Sherwood & Co., Trustees.....	177	100	50 00
B F Sherwood & Co., Trustees.....	178	200	100 00
B F Sherwood & Co., Trustees.....	179	100	50 00
B F Sherwood & Co., Trustees.....	181	100	50 00
James W Wright.....	182	383	191 50
R F Scott, Trustee.....	183	234	117 00
R F Scott, Trustee.....	184	100	50 00
R F Scott, Trustee.....	185	100	50 00
T Campbell, Trustee.....	186	50	25 00
T Campbell, Trustee.....	187	50	25 00
T Campbell, Trustee.....	188	50	25 00
T Campbell, Trustee.....	189	50	25 00
B F Sides.....	190	100	50 00
B F Sides.....	191	100	50 00
B F Sides.....	192	100	50 00
B F Sides.....	193	100	50 00
B F Sides.....	194	100	50 00
W H Henderson.....	195	100	50 00
W H Henderson.....	196	100	50 00
W H Henderson.....	197	100	50 00
W H Henderson.....	198	100	50 00
W H Henderson.....	199	100	50 00
B F Sides.....	200	831	415 50
W H Henderson.....	201	1287	643 50
G Smith.....	204	100	50 00
Myron Angel.....	205	100	50 00
W E Lamb.....	207	50	25 00
B F Sides.....	209	5618	2,809 00

And in accordance with law, and an order of the Board of Directors, made on the 7th day of May, 1873, so many shares of each parcel of said stock as may be necessary, will be sold at public auction, at the office of the Company, No. 314 California street, San Francisco, California, on the 12th day of July, 1873, at the hour of 1 o'clock, p. m., of said day, to pay said delinquent assessment thereon, together with costs of advertising and expenses of sale.
LOUIS FRANKLIN, Secretary.
Office, No. 314 California street, San Francisco, California. j14

Omega Table Mountain Mining Company.
Location of works, Tuolumne County, California.
Notice is hereby given, that at a meeting of the Board of Directors, held on the 4th day of June, 1873, an assessment (No. 2) of Five Cents per share was levied upon the capital stock of the Corporation, payable immediately, in United States gold and silver coin, to the Secretary, at No. 28 Merchants' Exchange, San Francisco, California. Any stock upon which this assessment shall remain unpaid on the 15th day of July, 1873, will be delinquent and advertised for sale at public auction, and unless payment is made before, will be sold on the 23rd day of July, 1873, to pay the delinquent assessment, together with costs of advertising and expenses of sale. By order of the Directors.
DAVID WILDER, Secretary.
Office, No. 28 Merchants' Exchange, California street, San Francisco, California. j5-4w

Rising Star Mining Company--Location of principal place of business, San Francisco, California.
Notice--There are delinquent upon the following described stock, on account of assessment levied on the 25th day of April, 1873, the several amounts set opposite the names of the respective shareholders as follows:

Names.	No. Certificate.	No. Shares.	Amount.
E B Barnes.....	372	100	\$ 5 00
E B Barnes.....	358	25	1 50
J M Buington, Trustee.....	50	100	6 00
J M Buington, Trustee.....	59	50	3 00
J M Buington, Trustee.....	60	100	6 00
J M Buington, Trustee.....	64	100	6 00
J M Buington, Trustee.....	65	100	6 00
J M Buington, Trustee.....	66	100	6 00
J M Buington, Trustee.....	67	100	6 00
J M Buington, Trustee.....	68	100	6 00
J M Buington, Trustee.....	144	69	3 45
J M Buington, Trustee.....	173	60	3 00
J M Buington, Trustee.....	374	100	6 00
J M Buington, Trustee.....	382	100	5 00
J M Buington, Trustee.....	383	100	5 00
J M Buington, Trustee.....	401	375	22 50
J M Buington, Trustee.....	413	331	19 86
J M Buington, Trustee.....	419	25	1 50
J M Buington, Trustee.....	420	25	1 50
J M Buington, Trustee.....	421	25	1 50
O Brown.....	116	25	1 50
O Brown.....	117	25	1 50
O Brown.....	118	25	1 50
O Brown.....	119	25	1 50
O Brown.....	120	25	1 50
O Brown.....	121	25	1 50
O Brown.....	122	25	1 50
O Brown.....	123	25	1 50
O Brown.....	124	25	1 50
O Brown.....	125	25	1 50
O Brown.....	126	25	1 50
O Brown.....	127	25	1 50
O Brown.....	128	25	1 50
O Brown.....	129	50	3 00
O Brown.....	136	50	3 00
O Brown.....	137	22	1 32
W Bryan.....	152	12	72
H B Berryman.....	186	100	6 00
H B Berryman.....	188	100	6 00
H B Berryman.....	189	50	3 00
H B Berryman.....	195	50	3 00
H B Berryman.....	356	50	3 00
M Bannon.....	394	50	3 00
Jacob Bryan.....	415	25	1 50
Frank Clayton, Trustee.....	423	331	19 86
Frank Clayton, Trustee.....	427	662	39 72
W J Green.....	308	200	12 00
N B Green.....	34	100	5 00
N B Green.....	35	31	1 86
R W Gunn, Trustee.....	364	50	3 00
R W Gunn, Trustee.....	365	50	3 00
R W Gunn, Trustee.....	366	50	3 00
R W Gunn, Trustee.....	367	50	3 00
T O Hutchinson.....	437	100	50 00
S T Kennedy.....	158	100	6 00
S T Kennedy.....	343	857	6 20
P Newman.....	194	50	3 00
P Newman.....	195	50	3 00
P Newman.....	196	50	3 00
S Nathan, Trustee.....	424	351	19 86
A Rosenfield.....	32	24	1 44
A Rosenfield.....	298	1000	60 00
A Rosenfield.....	299	100	5 00
A Rosenfield.....	300	100	6 00
M Rosenbaum.....	177	331	19 86
Daniel Sheehan.....	414	60	3 00
C A Wakeman.....	415	50	3 00

And in accordance with law, and an order of the Board of Directors, made on the 25th day of April, 1873, so many shares of each parcel of said stock as may be necessary, will be sold at public auction, at the office of the Company, room 37 New Merchants' Exchange, California street, San Francisco, Cal., on Monday, the 16th day of June, 1873, at the hour of 12 o'clock, p. m., of said day, to pay the delinquent assessment thereon, together with costs of advertising and expenses of sale.
J. M. BUFFINGTON, Secretary.
Office, 37 New Merchants' Exchange, California street, San Francisco, California. m29

Mansfield Gold Mining Company--Principal place of business, San Francisco, California. Location of works, Kelsey Mining District, El Dorado County, California.
Notice is hereby given, that at a meeting of the Board of Directors, held on the 8th day of May, 1873, an assessment of five cents per share was levied upon the capital stock of the corporation, payable immediately, in United States gold and silver coin, to the Secretary, at the office of the Company, No. 23 Kearny street, San Francisco, Cal. Any stock upon which this assessment shall remain unpaid on the 9th day of June, 1873, will be delinquent and advertised for sale at public auction, and unless payment is made before, will be sold on Tuesday, the 1st day of July, 1873, to pay the delinquent assessment, together with costs of advertising and expenses of sale.
WM. SMALL, Secretary.
Office, No. 23 Kearny street, San Francisco, Cal. m15

POSTPONEMENT.--The day for deeming shares delinquent on the above assessment is hereby postponed until Monday, the 18th day of June, 1873, and the sale thereof until Tuesday, the 8th day of July, 1873. By order of the Board of Directors. [J11-td] WM. SMALL, Secretary.

Regent Consolidated Mining Company.
Principal place of business, San Francisco, California. Location of works, Little Cottonwood District, Salt Lake County, Utah Territory.
Notice is hereby given, that at a meeting of the Board of Directors, held on the 26th day of May, 1873, an assessment of ten cents per share was levied upon the capital stock of the corporation, payable in lawful currency of the United States, to the Secretary, No. 438 California street, San Francisco, California.
Any stock upon which this assessment shall remain unpaid on the 25th day of June, 1873, will be delinquent and advertised for sale at public auction, and unless payment is made before, will be sold on Monday, the 22nd day of July, 1873, to pay the delinquent assessment, together with costs of advertising and expenses of sale.
WM. L. USTICK, Secretary.
Office, 438 California street, San Francisco, Cal. m27

Schell Creek Mining Company--Location of principal place of business, No. 304 California street, San Francisco, California. Location of works, Schell Creek Mining District, White Pine County, State of Nevada.
Notice is hereby given, that at a meeting of the Board of Directors, held on the 18th day of April, an assessment of ten cents per share was levied upon the capital stock of the corporation, payable immediately, in United States gold coin, to the Secretary, at the office of the Company, No. 304 California street, San Francisco, California.
Any stock upon which this assessment shall remain unpaid on the 14th day of May, 1873, will be delinquent and advertised for sale at public auction, and unless payment is made before, will be sold on Monday, the 24th day of June, 1873, to pay the delinquent assessment, together with costs of advertising and expenses of sale.
WM. L. USTICK, Secretary.
Office, No. 304 California street, San Francisco, Cal. e19

POSTPONEMENT.--The day for deeming shares delinquent on the above assessment is hereby postponed until Saturday, the 24th day of May, 1873, and the sale thereof until Monday, the 16th day of June, 1873. By order of the Board of Directors.
P. W. VAN WINKLE, Secretary.

POSTPONEMENT.--The day for deeming shares delinquent on the above assessment is hereby postponed until Saturday, the 7th day of June, 1873, and the sale thereof until Monday, the 30th day of June, 1873. By order of the Board of Directors.
P. W. VAN WINKLE, Secretary.

POSTPONEMENT.--The day for deeming shares delinquent on the above assessment is hereby postponed until Friday, the 27th day of June, 1873, and the sale thereof until Monday, the 21st day of July, 1873. By order of the Board of Directors.
P. W. VAN WINKLE, Secretary.

Stanislaus Water Company--Location of principal place of business, 525 Kearny street, rooms 1 and 2, San Francisco. Location of works, near La Grange, Stanislaus County, California.
Notice is hereby given, that at a meeting of the Directors, held on the 3d day of June, 1873, an assessment (No. 1) of two cents per share was levied upon Three Hundred Thousand Shares of the capital stock of the Corporation, payable immediately in United States gold coin, to the Secretary, at the office of the Company, 525 Kearny street, San Francisco, California. Any stock upon which this assessment shall remain unpaid on the seventh day of July, 1873, will be delinquent and advertised for sale at public auction, and unless payment is made before, will be sold on the twenty-eighth day of July, at 1 o'clock p. m., 1873, to pay the delinquent assessment, together with costs of advertising and expenses of sale.
C. C. TRIPP, Secretary.
Office, 525 Kearny Street, Rooms 1 and 2, San Francisco.

The Sanderson Gold Mining Company--Location of works, Railroad Flat, Calaver

Machine Builders.

ESTABLISHED 1851.

PACIFIC IRON WORKS,

First and Fremont streets,

SAN FRANCISCO

W. P. HANKIN, A. P. BRAYTON,

GEO. W. FOGG, Superintendent.

Steam Engines and Boilers,

MARINE AND STATIONARY,

IRON AND BRASS CASTINGS

Mining Machinery of Every Description,

And all other classes of work generally done at first-class establishments, manufactured by us at the lowest prices, and of the best quality.

Particular attention paid to Jobbing Work and Repairs.

N. B.—Sole Agents for sale of HUNTOON'S CELEBRATED PATENT GOVERNOR.

18v20-3m

GODDARD & CO.

FULTON

Foundry and Iron Works.

HINCKLEY & CO.,

MANUFACTURERS OF

TEAM ENGINES,

Quartz, Flour and Saw Mills,

Wheeler's Improved Steam Pump, Brodie's Improved Crusher, Mining Pumps, Amalgamators, and all kinds of Machinery.

N. E. corner of Tehama and Fremont streets, above How street, San Francisco.

8-97

THE RISDON

Iron and Locomotive Works.

INCORPORATED.....APRIL 30, 1868.

CAPITAL.....\$1,000,000.

LOCATION OF WORKS:

Corner of Beale and Howard Streets,

SAN FRANCISCO.

Manufacturers of Steam Engines, Quartz and Flour Mill Machinery, Steam Boilers (Marine, Locomotive and Stationary), Marine Engines (High and Low Pressure). All kinds of light and heavy Castings at lowest prices. Oams and Tappets, with chilled faces, guaranteed 40 per cent. more durable than ordinary iron.

Directors:

Joseph Moore, O. J. Brenham, O. E. McLane,

Wm. Norris, Wm. H. Taylor, Lloyd Tevis,

James D. Walker.

WM. H. TAYLOR.....President

JOSEPH MOORE.....Vice-President and Superintendent

LEWIS B. MEAD.....Secretary

24v17-07

UNION IRON WORKS,

Sacramento.

ROOT, NEILSON & CO.,

MANUFACTURERS OF

STEAM ENGINES, BOILERS,

CROSS' PATENT BOILER FEEDER AND SEDIMENT COLLECTOR

Dunbar's Patent Self-Adjusting Steam Piston

PACKING, for new and old Cylinders.

And all kinds of Mining Machinery.

Front Street, between N and O streets,

SACRAMENTO CITY.

PACIFIC

Rolling Mill Company,

SAN FRANCISCO, CAL.

Established for the Manufacture of

RAILROAD AND OTHER IRON

Every Variety of Shafting,

Embracing ALL SIZES of

Steamboat Shafts, Cranks, Piston and Connecting Rods, Car and Locomotive Axles and Frames

ALSO—

HAMMERED IRON

Of every description and size.

Orders addressed to PACIFIC ROLLING MILL COMPANY, P. O. Box 2022, San Francisco, Cal., will receive prompt attention.

The highest price paid for Scrap Iron.

Miners' Foundry and Machine Works,

CO-OPERATIVE,

First Street, bet. Howard and Folsom, SAN FRANCISCO

Machinery and Castings of all kinds.

FISHER'S

KNUCKLE

JOINT

AND

NOZZLE

IS THE

Oldest and Best

Hydraulic Machine

in use.



The reliable party in the Hydraulic business who protects his patrons.

9v23-11

Address F. H. FISHER, Nevada, Cal.

HYDRAULIC MINERS, TAKE NOTICE—I hereby caution Miners and Manufacturers against making, buying, selling or using a Hydraulic Machine or Joint known as the Little Giant, manufactured and sold by R. R. & J. Craig and Richard Hoekin, as the same is an infringement upon the invention of the machine known as FISHER'S HYDRAULIC CHIEF, secured by Letters Patent, No. 110,222, dated Dec. 20, 1870. All parties participating in such infringement will be rigorously prosecuted. Nevada, Jan. 18th.

F. H. FISHER.

THE LIGHTNING MILL.



THE

LIGHTNING MILL

For Pulverizing Quartz,

"Charleston Rock," and all Native Phosphates, Flint, Feldspar, Iron Ore, Manganese, Antimony, Carbon, Oorundum, Old Crucibles, Barytes, Brimstone, Slate, Soapstone, Graphite, Glass, Marble, Plaster, Anthracite and Bituminous Coals, etc.

WM. STEWART'S

Patent Bone Mills and

Crushers.

For Grinding Bones, Rock, Quartz, and all hard substances; also, Corn, Wheat, Oats, Barley, Coffee, Spices, etc.


WALKER BROS. & CO., Twenty-third and Wood Streets, Philadelphia, Sole Manufacturers of Stewart's Celebrated Patent Bone Mills and Crushers, A. W. Straub & Co.'s Patent Revolution French Burr Mill and A. Duval's Patent Centrifugal Pumps.

CAMERON'S

MINING STEAM PUMPS.

DAVID STODDART,

114 Beale Street, SAN FRANCISCO.



JOHN WRIGHT,

Manufacturer of all Kinds of MINERS' and RAILROAD PICKS,

(ALL ADZE-EYES) OF SUPERIOR QUALITY.

13 and 15 Fremont Street, at Nelson & Doble's,.....San Francisco.

Sole Agent for Washoe Tool Mfg Co.'s Goods west of Rocky Mountains.

No. 1 Round Eye surface, 4 lbs.....	\$14	No. 17 Drifting.....4½ lbs.....	\$17
No. 2 " " " 4½ lbs.....	14	No. 18 " " " 6 lbs.....	17
No. 3 " " " 6 lbs.....	15	No. 19 " " " 6½ lbs.....	20
No. 4 " " " 6½ lbs.....	20	No. 20 " " " 6 lbs.....	24
No. 5 " " " 6 lbs.....	20	No. 21 Poll " " " 4½ lbs.....	20
No. 6 " " " 6½ lbs.....	22	No. 22 " " " 6 lbs.....	20
No. 7 " " " 7 lbs.....	24	No. 23 " " " 6 lbs.....	20
No. 8 Flat Eye surface, 4 lbs.....	18	No. 24 " " " 6½ lbs.....	23
No. 9 " " " 4½ lbs.....	18	No. 25 " " " 6 lbs.....	24
No. 10 " " " 6 lbs.....	18	No. 26 " " " 6½ lbs.....	30
No. 11 " " " 5½ lbs.....	20	No. 27 " " " 7 lbs.....	30
No. 12 " " " 6 lbs.....	22	No. 28 Coal " " " 2 lbs.....	14
No. 13 " " " 6½ lbs.....	24	No. 29 " " " 2½ lbs.....	14
No. 14 " " " 7 lbs.....	24	No. 30 " " " 3 lbs.....	16
No. 15 Drifting.....3½ lbs.....	16	No. 31 " " " 3½ lbs.....	16
No. 16 " " " 4 lbs.....	16		

Washoe Mattocks and other Washoe goods cheap. Also, Pick Eyes ready for the steel, for Blacksmiths, which will be sold cheap. Prices from \$12 to \$16.

14v26-2am3m

CALIFORNIA BRASS FOUNDRY,

No. 125 First street, opposite Minna,

SAN FRANCISCO.

ALL KINDS of Brass, Composition, Zinc, and Babbitt Meta Castings, Brass Ship Work of all kinds, Spike, Sheathing Nails, Rudder Braces, Hinges, Ship and Steamboat Bells and Gongs of superior tone. All kinds of Cocks and Valves, Hydraulic Pipes and Nozzles, and Hose Couplings and Connections of all sizes and patterns, furnished with dispatch.

PRICES MODERATE.

J. H. WEEP, V. KINGWELL.

THOMPSON BROTHERS,

EUREKA FOUNDRY,

129 and 131 Beale street, between Mission and Howard,

SAN FRANCISCO.

LIGHT AND HEAVY CASTINGS,

of every description, manufactured. 24v16qr

A. HANKE'S

IRON FOUNDRY,

CORNER MAIN AND HARRISON STREETS,

Entrance on Main Street.....San Francisco.

Every Description of Ornamental Work,

Stove and French Range Work, grate and fender work, small machine of all descriptions, house work, etc., promptly attended to.

26v25-3m

SITUATION WANTED.

A Thoroughly Practical and Theoretical Miner, acquainted with the mining business in all its branches—Assaying, Amalgamating, Surveying, Etc.—wishes employment. Best references given.

Address K. Y. Z., this office.

m8tf

GEO. W. PRESCOTT. C. W. SCHEIDELL. W. B. ECKART.

PRESCOTT, SCHEIDELL & CO.,

MARYSVILLE FOUNDRY.

Corner of B and Fourth streets, Marysville, Cal.

MANUFACTURERS OF

STEAM ENGINES,

STATIONARY AND PORTABLE

SAW AND GRIST MILLS,

Hydraulic Machinery,

Quartz Crushing and Amalgamating Machinery

Of every description, constantly on hand.

Plans and estimates furnished upon application. Repairs upon all kinds of Machinery promptly made, and at moderate charges.

Having unrivalled facilities, we are prepared to make to order, at short notice, anything required in our line. Specimens of our work may be seen in all the mining regions on this coast.

NATIONAL LOCOMOTIVE WORKS.

DAWSON & BAILY,

Connellsville, Penn.,

Manufacture LOCOMOTIVES adapted to Every Kind of Railway Service.

NARROW GAUGE AND MINE LOCOMOTIVES A SPECIALTY.

All work accurately fitted to gauge, and thoroughly interchangeable.

H. A. GORLEY, Agent,

At T. G. Cockrill & Co.'s, No. 521 Front Street, S. F.

Photographs of Locomotives can be seen at the above Number.

12v26tf

OCCIDENTAL FOUNDRY,

137 and 139 First street.....SAN FRANCISCO.

STEIGER & BOLAND,

IRON FOUNDERS.


IRON CASTINGS of all descriptions at short notice. Sole manufacturers of the Hepburn Rolling Pan and Callahan Grate Bars, suitable for Burning Screenings.

NOTICE.—Particular attention paid to making Superior Shoes and Dies.

20v26-3m

CROCKER'S PATENT

TRIP HAMMER QUARTZ BATTERY.



The inventor having perfected and tested the durability and capacity of these Batteries to his entire satisfaction, is now ready to manufacture and guarantee them. Parties in want of a Battery cannot find their equal in regard to PRICE, WEIGHT, CAPACITY, POWER TO RUN THEM. State and County Rights for Sale by

G. D. CROCKER,

17v26 tf 315 California street, San Francisco.

THEODORE KALLENBERG,

MACHINIST,

and Maker of Models for Inventors. All kinds of Dies Stamps and Punches made. Also, all kinds of Small Gears Cut.

Repairing done on very Reasonable Terms and in the best manner. No. 32 Fremont street, S. F.

19v23-3m

SAN FRANCISCO

SCREW BOLT WORKS,

PHELPS BROTHERS, Proprietors

MANUFACTURERS OF ALL KINDS OF

Machine Bolts, Bridges Bolts, and Ship or Band Bolts.

13, 15 and 17 Drumm Street, San Francisco. 4v24ly

J. M. STOCKMAN,

Manufacturer of

PATTERNS AND MODELS,

(Over W. T. Garrett's Brass Foundry).

N. W. corner Natoma and Fremont streets; S. F. Entrance on Natoma street.

6v23-3m

San Francisco Cordage Company.

Established 1856.

We have just added a large amount of new machinery of the latest and most improved kind, and are again prepared to fill orders for Rope of any special length and sizes. Constantly on hand a large stock of Manila Rope, all sizes; Tarred Manila Rope; Hay Rope; Whale Line, etc., etc.

TUBBS & CO.,

17v26-1f 611 and 613 Front street, San Francisco.

JOE THORNHILL, C. W. WHITE,

1612 Mason Street, near Green. 47 Clay Street.

JOS. THORNHILL,

Bricklayer and Contractor

Particular attention paid to all kinds of FIRE WORK such as BOILERS, FURNACES, OVENS GRATES, RANGES, etc.

BROWN'S PATENT LAMP.



One of these Lamps, when placed at a distance of 200 feet from the bank, will light up a bank surface 250 feet in length and 150 feet high, and to a much better advantage than any other light heretofore tried, and at an expense not to exceed five cents per hour. Lamps furnished at short notice.

Letter of Recommendation.
Mr. C. B. Brown—Sir: Your Patent Lamp for lighting hydraulic mines, which you sold to me in December last, has given entire satisfaction, and far exceeds my expectations, and I think it the best and cheapest light ever used to light mining claims by night, and am satisfied that I have saved three hundred dollars by the use of it in the last mining season over pitch or any other light of the same brilliancy; and I will also say that if I could not get another lamp, five hundred dollars would not buy it. Yours,
W. D. APLIN.

Little York, Nov. 5, 1872.
For further particulars, address,
P. 22-11 C. B. BROWN, Placerville, Cal.

P. J. PHILLIPS & CO., No. 608 Clay street, near Montgomery, San Francisco, are agents for Brown's Lamp, where it may be seen.

The California Powder Works

No. 314 CALIFORNIA STREET,
SAN FRANCISCO.

Manufacturers and have constantly on hand
SPORTING,
MINING,
And BLASTING
POWDER,

OF SUPERIOR QUALITY, FRESH FROM THE MILLS. It being constantly received and transported into the interior, is delivered to the consumer within a few days of the time of its manufacture, and is in every way superior to any other Powder in Market.
We have been awarded successively

Three Gold Medals
By the MECHANICS' INSTITUTE and the STATE AGRICULTURAL SOCIETY for the superiority of our products over all others.
We also call attention to our

HERCULES POWDER.
Which combines all the force of other strong explosive now in use, and the lifting force of the BEST BLASTING POWDER, thus making it vastly superior to any other compound now in use.
A circular containing a full description of this Powder can be obtained on application to our Office.
16v20-3m JOHN F. LOHSE, Secretary.

Friel's Patent Paragon Vapor Stove.

PATENT GRANTED.
The Great Labor Saver of the Household.
ECONOMY, CONVENIENCE AND SAFETY COMBINED.



JUST THINK OF IT—
No Wood, no Coal, no Coal Gas, no Stove Pipe, no Chimney, no Smoke, no Ashes, no Dirt, no Wood Boxes, no Coal Scuttles, no Kindling Wood, but a Friction Match, and the Fire in Full Blast in Half a Minute!
OVEN HOT IN TWO MINUTES.
Steak broiled in seven minutes! Baked Beans in thirty minutes! The fire extinguished in a moment and the house unheated!
It has no rival in all kinds of Cooking and Flat Iron Heating, and combines Economy, Convenience, Neatness, Safety and Durability! The Ladies welcome it; a little Child can operate it, and

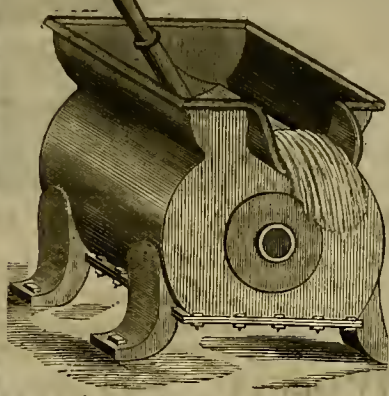
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21v26-1y

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We offer this wonderful Pump on this coast, confident that it surpasses any other in use when the amount of water discharged, the power required and the cost are compared; also the simplicity and durability of its working parts add to its great merit, it rarely getting out of order, and when it does, requiring no skill to repair it. It has no equal as a Windmill Pump.

Farmers, stock raisers, miners, ship owners, captains of vessels, dry-dock owners, irrigating companies, railroad men, or any one interested in Pumps, come and see its wonderful operations. This Pump has been approved (as a Fire and Bilge Pump) and adopted by the Superintending Board of Inspectors of Steam Vessels, and by the Secretary of the Treasury, as appears by Circular No. 4, issued from the Treasury Department February 21, 1872. This Pump can be seen on practical exhibition and for sale at our warehouses, No. 727 Market street, San Francisco. This Pump was exhibited and tested, with wonderful results, at the last State Fair in Sacramento.



rooms, No. 727 Market street, San Francisco. This Pump was exhibited and tested, with wonderful results, at the last State Fair in Sacramento.

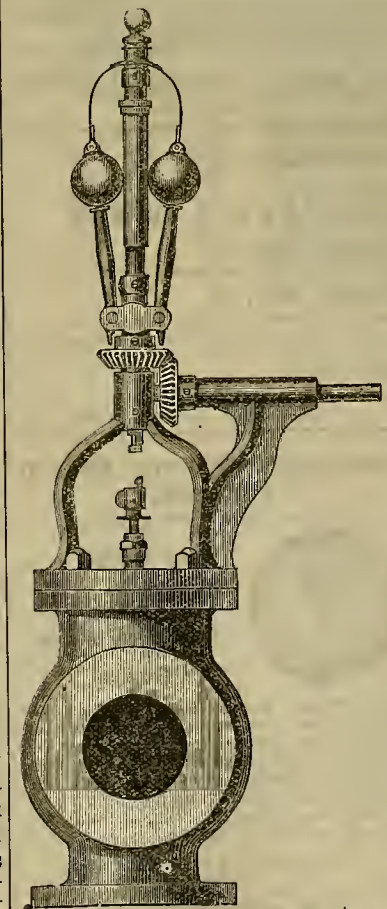
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OVER 400 HAVE BEEN PUT IN USE.



RECOMMENDATION.
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Feb. 10, 1873.
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Our engine is 12x36 (carrying 70 lbs. of steam), driving 16 stamps, 725 lbs. each; 1 Wheeler Fan, 1 Knox Fan, 6 Hendy Concentrators. The discarded Governor was the common "Arm and Ball Governor;" it giving but poor satisfaction, we decided to try the "HENDY," and are pleased to report in its favor for the following reasons:

1st. It SAVES US FUEL. Previous to attaching your Governor we were burning 34 cords of wood per 24 hours. We now consume but 2 1/2 cords doing the same work.

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4th. THE ADJUSTMENT for regulating the speed without increasing or reducing the size of our Governor pulley, is admirable, and as easily managed as setting a clock.

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Also, Bancroft & Co.; Yolo Mills; The Union, Golden Gate, Etna and Fulton Iron Works, of this city.

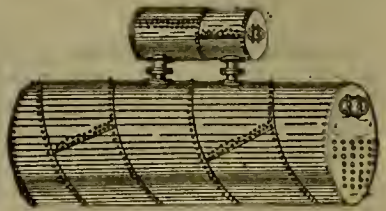
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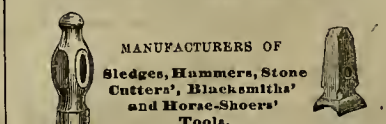
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THREE 35-Horse Power BOILERS, each 50 inches diameter, 16 feet long, containing 42 tubes 3x inches diameter. These boilers have been entirely rebuilt, and are in thoroughly good condition. Will be sold together, or separately, at a low price.

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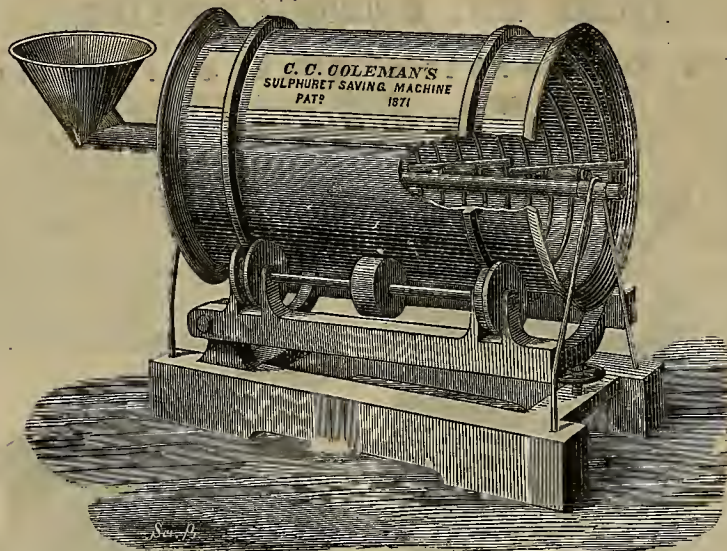
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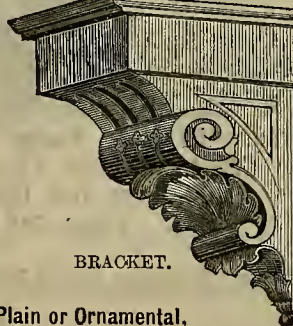
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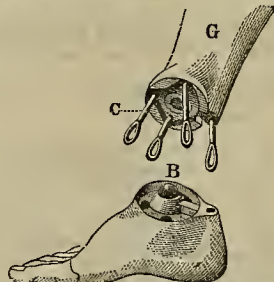
Its EXCLUSIVE use saves from 30 to 60 per cent. in expenses, besides doing the work in half the time required for black powder.

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Steam Gauges,
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Low Water Alarms, Gauge Cocks, Glass Water Gauges, Cylinder Cups, Self-Oilers, Foiler Felting, Selden's, Tuck's, Hemp and Soapstone Packing, Stocks, Taps and Dies, Twist Drills, Drill, Lathe and Planer Chucks, Emery Wheels, Etc.

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Covered by Numerous U. S. Patents.

IMPORTANT TO

Mining Companies, Civil Engineers, Contractors, Etc.

The system of transporting material, such as Ores, from the mine to the mill, Earths for embankments, Rock from quarries, etc., by means of steel wire rope, has been well tested and found more economical, advantageous and reliable than any other method of transportation; and to the annexed certificate in connection therewith I beg to call the attention of those interested:

T. M. MARTIN My dear Sir: On your leaving for San Francisco, it gives me great pleasure to hand you my written acceptance of the HALLIDIE TRAMWAY put up by you upon our mine in Freiberg.

It is a perfect success, discharging ten tons of ore per hour with two men's labor. It is perfectly simple in construction, and, as far as I can judge, there is nothing about it to ever get out of order—nothing to wear out. While our regular haul, about two thousand five hundred feet of wire rope, I can see no reason why the line could not be extended almost indefinitely with equally happy results. Again, the carrying capacity might be doubled or quadrupled if desired. After several weeks trial upon our mine, the unanimous verdict of all who have seen it is a complete, unquestioned success. If this can be of any service to you, use it in any way you think proper. Very respectfully, O. O. GOODWIN.

EMMA HILL CONSOLIDATED MINING CO.,
Little Cottonwood, Utah.
Superintendent's Office, Sept. 28, 1872.
T. M. MARTIN, Esq.—Sir: The Ropeway constructed by you (HALLIDIE'S PATENT) for the Emma Hill Consolidated Mining Company, has been built in most substantial and workmanlike manner, and is at this time in splendid working condition. I most cheerfully accept the work for the Company, and for no facilities they have wished a quick and speedy transit for ore over places impracticable for wagon roads, etc. Respectfully,
L. W. COLBATH, Superintendent.

"The Vallejo works smoothly with the elevated wire tramway, which carries its load of ore as quickly and easily as if there was no winter or snow in the world."
"Whatever the objections to wire tramways may be on account of their cost, I have seen nothing yet that even approaches them in the facilities they offer for the moving ore at all seasons of the year."—Correspondent Utah Mining Journal, Alta, Jan. 8, 1873.

The Vallejo Ropeway.

The Vallejo Tunnel Company's Tramway in Little Cottonwood, built on the HALLIDIE PATENTED PLAN, is a complete success. It is between 2,300 and 2,400 feet in length, and is supported by thirteen stations. The fall in this distance is about six feet, and the wire rope, which is three-fourths of an inch in diameter, will safely and easily deliver one hundred tons in six hours. The machinery is automatic, loading and unloading the sacks or binnets. About one ton and a half can be moved in the shortest time. The stations are about two hundred feet apart, and the entire apparatus is strong and safe. As the wire rope is elevated about forty feet above the surface of the hill, the tramway can be worked all winter long, without the slightest trouble.—Utah Mining Journal, Salt Lake, Sept. 28, 1872.
Mining Companies and others desiring to negotiate for the erection of this system of Ropeway, can communicate with me personally, or through Postoffice Box 964.

A. S. HALLIDIE, Patentee,

112 and 114 California Street, SAN FRANCISCO.

WIRE ROPE

For hoisting from mines, transmitting power, ship rigging etc., of all kinds and sizes, on hand and made to order. Wire of all kinds and descriptions, furnished at lowest rates. A. S. HALLIDIE, 112 and 114 California St.

SEND this paper to your friends abroad.

MINING AND SCIENTIFIC PRESS.

An Illustrated Journal of Mining, Popular Science and Progressive Industry.

BY DEWEY & CO.,
Patent Solicitors.

SAN FRANCISCO, SATURDAY, JUNE 21, 1873.

VOLUME XXVI.
Number 25.

Metallic Tile Roofing.

The question of fire-proof roofs is an important one, as is that of water-proof roofs. When the two improvements are combined, as they seldom are, we need go no farther. Now comes a roof which not only fulfils these requirements, but adds the feature of ornamentation, without detriment to the necessary utility. It is styled the Pappelendam Metallic Tile Roofing, after the inventor, who claims that in it, the objections to other methods are removed. Metal roofs are without doubt the best in use. Generally large plates or sheets are used, but the material being one of the best conductors of heat, they are liable to crack from expansion or contraction caused by heat or cold. Small ribbed plates of galvanized iron meet with less objection, but the necessity of overlapping one-half to prevent the rain from being driven underneath, renders this style of roof too heavy and expensive for general use.

The illustration accompanying this description shows the Pappelendam tile and its application. Figure 1 is a section of a building covered with roof tiles; Fig. 2 is a view representing a number of the tiles as arranged upon a roof; Fig. 3 is a detail sectional side view of the same; Fig. 4 is one of the roof tiles; and Fig. 5 is a wall tile; the white part of it is covered by the one above it and requires no description. On the lower edges can be pressed an ornament to cover a few nails or screws. The principle of the improvement consists in forming a covered channel between the ridges and the tiles to exclude the water. The tiles are made of galvanized iron and other suitable material and may be struck out of sheet metal, or cast as desired. The tiles may be made square or diamond-shaped and are placed diagonally upon the roof or wall, as shown in Fig. 2.

Upon the two upper edges of the tiles are formed two upwardly projecting ridges, about three-eighths of an inch in height, the ridges running along the edges of the tiles and the second ridge being parallel with and at a little distance from the outer ridge so as to form a channel between them, as shown in the drawing. This channel will conduct any water that may pass over the lower rib, downward, and deliver it up in the upper surface of the next tile below. Upon the under side of the lower edges is formed a single downwardly projecting ridge. The side angles of the tile are cut off as shown in Figs. 4 and 5. The tiles are arranged upon the roof or wall, as shown in Fig. 2; the downwardly projecting ridge of each upper tile being placed below, and embracing the upward projecting ridges of the adjacent edges of two tiles.

By this construction the inventor claims it will be impossible for water or wind to beat in and pass above the three ridges. Upon the body of the tiles, may be struck up, or otherwise formed, an ornament. It strengthens the tiles and prevents them from being rolled up by the wind, and, at the same time, adds greatly to the beauty of the roof or wall. The roof made in this manner is quite light, yet so firmly attached that it cannot blow off, as the ordinary tin roofs are apt to do. The tiles are joined so as to give the roof sufficient elasticity to guard against the effect of sudden charges of temperature. The roof is water tight, durable, and not liable to need repairs. The wall tiles shown in Fig. 5 can be easily attached to any kind of a house. They may be ornamented in any desired way, so that fashionable people can have their monogram all over the

house if they want it, and business men the insignia of their trade.

The great importance of the subject of roofing is fully realized by property owners everywhere. The safety and preservation of property depends in so great a degree upon the character of the roofing of buildings that there has been a general demand for some material that will afford greater protection than is obtained by any roofing heretofore in use. That made of shingles is liable to be ignited by sparks or cinders; slate is fit only for steep roofs, such as churches and steeples, and is moreover easily broken. Paper roofs are said to require too much attention to keep in repair. Houses with metal roofs and sides stand much less chance of fire than those without. Patrick Gibbons, of 513 California street, in this city, or 398 Tenth street, Oakland, is pro-

Scientific and Mechanical Progress.

New and gigantic inventions mark almost every passing year, and new powers of nature are constantly being evoked, which give birth to new and lucrative possessions in the domains of Art and Science. Man seems to have only to propose, and somebody or something comes along by which he is enabled to carry out his purpose.

Dr. Lardner thought, in 1827, he had fully proved that the then mooted project of transporting passengers by railroad, at a high rate of speed was utterly impracticable; but two years afterward Stephenson's locomotive completely demolished Lardner's logic. A famous engineer was once asked to give an opinion about the feasibility of an aqueduct planned by Brindley, a mechanic somewhat in advance of

could a mountain of ore on the earth, tells us that we are as yet only on the confines of discovery. Hundreds of new subjects are still open to the research of the chemist, the philosopher and the inventor, and many rich and important secrets are in store as rewards for original investigation into the arcana of physical science.

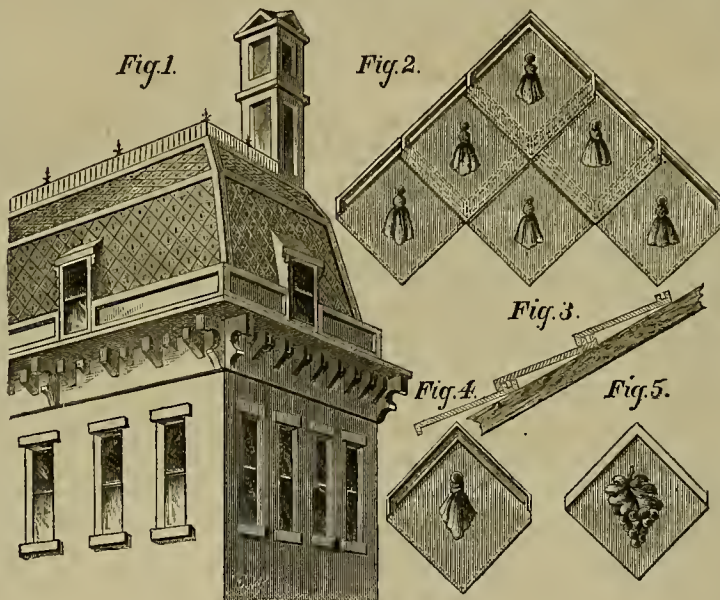
Verily it seemeth that the time has come when "knowledge runneth to and fro." So quickened and so successful is the human intellect, that the application of a principle in one direction only paves the way for its higher application in some other department of research or art.

Palmacea—Palms.

The number of known species of palms are over a thousand. The most remarkable are the Betelnut palm (*areca catechu*), the fruit of which, divided into quarters, rolled in the pepper leaf, and sprinkled with lime, is in general used as a masticatory amongst the natives of the East Indies, much the same as tobacco is employed by us. This mixture gives a red tinge to the saliva, and seems to have some narcotic power. The Sago palm (*Saguerus Rumphii*) grows in the south of China, Japan, and all over the East Indies. The pith of this palm, from which the sago is obtained, is a chief means of nourishment for millions in warm climates, and is exported largely from Singapore, where it is manufactured. In our California climate it is both nutritive and easy of digestion. It is much used for puddings, and constitutes an excellent article of diet for invalids. The Oil palm (*Elais Guineensis*) is a native of the western coast of Africa. The oil is obtained from the fruit, which is about the size of an olive, and of a yellow color. The Cocoa-nut palm (*Cocos nucifera*), which grows by the sea-side in most tropical countries, is especially abundant throughout the South Sea Islands. It forms a fine shade. It makes a good thatch, and excellent baskets. The young leaflets make fans and bonnets; also clothing, goblets, likewise fire kindling, fish lines, and cords, a balsam for wounds from the juice of the nut, and oil for embalmment of the dead. Posts can be made from the trunk, and charcoal to cook with; paddles for canoes, and oars and spears for battle. Lastly, we direct attention to the Donm palm of Upper Egypt (*Hyphene Thebaica*). The fruit of this is much larger than the Date palm (*Phoenix dactylofera*), and is equally nutritious. The rind of the fruit is brown and mealy, and has both the taste and color of gingerbread; hence one of its common names is the gingerbread tree. The spongy, internal portion of the fruit of this palm forms an important article of food, and when this pulp is mixed with an infusion of dates, it constitutes a cooling drink, much prescribed by the Arabs in febrile affections as cooling and demulcent.

THE BULLIONVILLE RAILROAD.—We see by the Pioche Record, that the Nevada Central Narrow-gauge Railroad, between Pioche and Bullionville, has been completed. The new locomotive weighs 36,000 pounds. Another locomotive is in the shops. The completion of this railroad marks an important epoch in the progress of Southern Nevada. The facilities for getting Ely District ores to the mill are greatly increased.

WORK on the tunnel near Martinez, which is being cut through for the road to be constructed from Bantas to Oakland, is being pushed with energy. Two shifts of men are engaged in the work.



IMPROVED ROOFING.

prietor of this patent for the Pacific States and Territories, and those desiring further information on the subject can address him at either place.

PAUL'S PROCESS IN UTAH.—Our Utah exchanges are filled with encomiums on Mr. Paul's "Electro Magnetic Dry Amalgamating Process," which has lately been introduced in that Territory. Mr. Paul has put up a 5-ton mill on the Enterprise mine, at Springfield, Utah, and the proprietors are so well satisfied with its work that they have ordered another of the same capacity. They publish a card testifying to the practicability and efficiency of the process. Mr. Paul has the interests of the mining community at heart, and has labored assiduously to introduce his process on the coast, and is now meeting with a reward. There are now five of these mills in operation, one of which is in Australia. The bullion turned out of the new mill was assayed by Messrs. Selby & Gunter, of Salt Lake City, and shows a fineness of 995, which speaks well for the process. It is pure and clean, and looks quite different from the generality of silver bullion.

COMPROMISED.—The controversy between the Eureka Consolidated Company and the Richmond Mining Company has been amicably settled, the latter company paying a round sum for the title of the Eureka Company to the Lookout ground, which was the matter in dispute between them. It is also said that the Eureka Consolidated mine will shortly resume monthly dividends.

his day. After looking at the place the engineer quietly remarked that he had often heard of castles in the air, but he had never before seen the spot selected for the site of one; yet the aqueduct was built.

It is a little over fifty years since the idea of propelling vessels by steam was pronounced the height of folly. Forty years ago the idea of issuing ten or fifteen thousand copies of a daily paper would be forever an impossibility, for lack of a machine on which to print so large an edition with sufficient celerity; now an edition of 200,000 is no impossibility.

Who could have imagined, fifty years ago, that the sun would ever be employed to print the crimson face, or the moon to take its own portrait? Who, at that time, could have thought that the fierce lightning could ever be so tamed and harnessed to convey the thunder of Senates to their constituents thousands of miles away, as fast as the hurrying words of eloquence fell from their individual lips? Yet all these things and vastly more have been realized during the lives of the present generation, and greater than these are still in store; for let no one imagine that the field of invention and research is any less restricted than it was fifty years ago. The study of the properties of light which, almost within the last decade, has led to the construction of an instrument by which we can analyze the sun or star more readily than we

CORRESPONDENCE.

Little York, Nevada County.

[Written for the Press.]

The Mining Outlook — Short-Water Season.

EDITORS PRESS:—The condition and outlook of the mining interest in this part of the State is not very different from what it was when your traveling correspondent visited and gave such a full and excellent description of it some fourteen months ago. The only drawback to a fairly-successful season in hydraulic mining, the principal branch carried on here, is the threatened short supply of water, which has already ceased to run in some of the smaller ditches, and even begun to fall off in those heading in the higher Sierra; the prospect being that the season will be at least four weeks shorter than usual, owing to the early disappearance of the snow on the mountains.

Mines and Mining in Little York Township.

If we include the adjacent camps of Dutch Flat and Gold Run, there is as much hydraulic mining done, perhaps, in this as any other township in the State; the material operated upon being, at the same time, of a superior quality and the natural facilities for prosecuting the business unusually good. But the ground as yet opened and operated here is not a tithe of what might be profitably worked, could capital be had for fitting up claims and water be procured for washing the gravel. But here is the trouble—the quantity of water is comparatively limited, with no chance for largely increasing the supply. Capital could, no doubt, be had, and of gravel there is no stint, but, about all the water available for mining purposes has already been utilized, the only chance left to much increase the quantity lying in the construction of additional reservoirs, for which there remain still a few unappropriated sites in the mountains. The present summer, however, will see these about all taken up, at least so far as there are any left unclaimed in this section of country.

As regards hydraulic gravel, there is enough along the ridge formed by Bear River, Steep Hollow, Greenhorn and their branches to profitably employ the water flowing through half the ditches in the State. There are here thousands of acres of deep gold-bearing banks, some of them just sufficiently prospected to demonstrate their value, with here and there a small patch washed off or being actively worked, the greater portion remaining wholly untouched. Under these ridges run in every direction sections of the old buried rivers, carrying in the lowest part of their channels the characteristic blue gravel.

The idea of there being but one dead river creating a single blue lead, is, of course, now exploded; experience having shown that these ancient channels are very numerous in this region of country, and that each one has created its own "blue lead,"—this being the color of the gravel wherever it lay sufficiently low to be protected from the influence of the air and the atmospheric water which, by decomposing the iron pyrites present, have tinged the upper strata gravel with a rusty hue. Doubtless there was one main river that, with many meanderings, flowing generally north and south, passed in this vicinity through Quaker Hill, Red Dog, under Chalk Bluff, having here made a sharp curve to the east, after which, doubling on itself, it swept round to the southwest, and passing You Bet, bore off to the southeast through Little York till it reached Dutch Flat, where, making another deflection to the southwest, it held on in that direction through Gold Run, Low Hill, and Forest Hill to Todd's Valley, where it disappears, having been swept away by the Middle Fork of the American River. This central trunk had many branches, vestiges of which are found coming in on the east at Berrington Hill, Mount Oro, Buckeye Hill, Chalk Bluff, Little York, and under or along all the other ridges between Bear River, Steep Hollow, Greenhorn and their tributaries, enriching the diggings at Elmore, Liberty, Lowell, and Remington Hills, and also at Stranahan's, the Cascades, Red Diamond, and many other old camps along these several divides.

A District Set Back from Want of Water.

In passing up these ridges and the cañons separating them, one sees many points where mining was formerly carried on, sometimes by drifting and again by ground-sluicing, or the hydraulic process; some of the latter fitted up extensively and at considerable cost. But there is very little work going on here now, the ditch companies having shut off the water and practically forced the miners out of the country. Everywhere the cabins and hamlets are deserted and in ruins. The branch ditches, which the miners had built at their own expense to bring the water from the main, are half and half filled up, the flumes and sluices decayed, and the iron pipes covered with rust; and this, not because the mines were at fault, but simply because water could not be had to work them. Wherever opened, the gravel here has been found to pay remarkably well, showing that these side channels are equally as good as any other portion of the old river system. On Berrington Hill, lying between the main forks of Deer Creek, and on Mt. Oro, the next ridge south, there is now scarcely a cabin occupied or a miner to be seen, although

there are here more than twenty hydraulic claims; some of them partially, and others thoroughly opened, nearly half of them having been well fitted up and run as long as water could be had, with capital results. On the other divides, between the branches of Greenhorn and Steep Hollow, nearly a like condition of things exists; and yet a thousand men might find profitable employment here, if they had the means to open up these grounds and the water to work them.

A Prospect of Relief.

At the present time a company, made up in part of miners living here and owning many claims on these ridges, and in part of business men, residents of San Francisco, are engaged consolidating these claims with others, and adding much valuable property thereto; it being their intention to bring in an adequate supply of water, through ditches now owned by them, or through others which they expect to procure. This association has been organized under the name of the Bear River and Chalk Bluff Fluming, Ditch and Mining Company, it being a part of their plan to construct an immense tunnel under the divide between Bear River and the North Fork of the American, and laying down flumes in the former, run off the vast accumulation of tailings that have lodged in that stream and its tributaries, and, passing them through this tunnel discharge them into the deep cañon of the North Fork. This company own here several thousand acres of mining land, every part of it permeated by one of the largest of our pliocene rivers and feeders, the whole overlaid by beds of gravel from one to three hundred feet in depth. Their main canal will reach over 150 miles, exclusive of branches, while the extent of their tailing claims are estimated to cover at least 20 miles, and to be 100 feet wide and 50 feet deep. The Company, through its agents, has been very active here for the past two months, making surveys, locating tunnel rights, and otherwise perfecting their preliminary labors, all of which are about being brought to a close. They are said to be financially strong, and have certainly shown no lack of energy or judgment in getting together a magnificent property, and placing the whole scheme on what seems a sound and practical basis. This is by far the most important mining enterprise ever set on foot in California, whether reference be had to the magnitude of the property so skillfully aggregated, the outlay of labor and money involved, or

The Benefits Likely to Result from Its Early and Successful Prosecution.

For many years past the gulches and streams in this neighborhood have been rapidly filling up with tailings, these having so accumulated at some points as to prevent further hydraulic working, and should this cause of obstruction be suffered to continue much longer, work on many other valuable claims will have to be suspended. All attempts at working the great body of these tailings further down stream have signally failed, nor can this be accomplished until an outlet is furnished carrying them clear out of Bear River. This the proposed tunnel would do, nor does there seem to be any other feasible plan for effecting that object. As a consequence its construction, already called for, will soon have grown into a necessity, the exigencies of which will increase with every year's delay. This tunnel has long been a dream with the miners here who see in it the means of relieving them from a threatened evil, and a source of enrichment to those who are to participate in the profits likely to arise from its construction.

Truly marvelous are the stories told of the wealth buried under or supposed to be mixed up with these tailings, it being the current opinion among miners that not one-half the gold they originally contained was ever extracted from them. If these notions be well founded, then must they hold in their keeping many millions of dollars, these gulches and streams whence they came having been amongst the most opulent in California. Certain it is they contain gold enough to warrant the outlay contemplated by this Company, who will make themselves to some extent public benefactors, should they carry this great and useful work to an early completion.

The Following Hydraulic Companies

Are now at work in this neighborhood: Jacob & Sargent at Quaker Hill; Rose & Duryea at Buckeye Hill and Chalk Bluff. The Birdseye Co. at You Bet, and the Little York at this place. They run from four to six streams and consume about 2,000 inches of water, each under a pressure ranging from one hundred and fifty to two hundred and fifty ft. each. They usually make two weeks run, clearing up from \$1,200 to \$2,000 to each pipe, with the exception of the Little York Company, who own three ditches having capacity to carry 1,000 inches each; these parties obtain nearly all their water from the South Yuba Company, who own the most extensive system of canals and the best water franchise in the State. Although they sell water at the low price of 12½ cents per inch for 24 hours, their revenues are large and their property very valuable; of the ten or a dozen cement mills operating about here a few years ago not more than two or three are now running; the manner in which the cemented gravel is now broken up with powder and the powerful streams brought to play upon it, aided by the present more efficient system of undercurrents and dumps, enabling the miner to extract the gold from this material pretty effectually without recourse to crushing, which

besides being expensive was a very slow and tedious method for disposing of it.

H. DEGROOT.

Little York, Nevada Co., June 7, 1873.

A California Miner in the East.

[Written for the Press.]

EDITORS PRESS:—Since I bid you adieu, I have wandered through the mining regions of the East, from northern Jersey to northern Georgia, where I find a decided difference in visiting these mines, to those of the West; there is not such suspicion expressed by the officers; and the "No Admittance" which is frequently seen in the West, is rarely met with in the East; everywhere I applied I was politely escorted through the mines, and went whither I pleased. In the neighborhood of Dover, New Jersey, a stranger is surprised at the amount of magnetic iron ore excavated daily, from veins imbedded in gneiss, and extending for many miles in length. The most extensive mine is "Mount Hope," yielding about 10,000 tons monthly, employing nearly 700 men.

The Coal Fields of Pennsylvania

Are so well known that even a hint here is needless. In the southeastern part, Lancaster county, are situated the nickel mines which were wrought for copper prior to the "Revolution," at which time the nickel was cast aside as valueless; now it is the chief ore sought after. I was under the impression that these mines formed well defined veins, but it is otherwise, being very irregularly deposited between two formations, hornblende and slate. These deposits are composed of a superfluity of iron pyrites, (which nickel ore very much resembles) copper, cobalt, etc., with myriads of rounded pebbles, from the smallest size imaginable to large boulders, all of a substance foreign to the surrounding strata. South of these mines in the same locality are the abandoned chromium mines in a similar formation (serpentine) to those deposits so plentiful in the Coast Range mountains. There are but few

Mines in Operation in Maryland,

Except in the western part, wherein is the Cumberland Coal Basin which produces large amounts of bituminous coals. West Virginia is of a similar nature. Old Virginia is awakening slowly from her lethargy.

Eastern Tennessee.

There are many mines in operation, yet on a small scale, except at Ducktown copper mines, which are superficially extensive, its characteristics being very similar to the copper mines of the West which are enveloped in mica, slate, carbonates, black oxides, yellow sulphurets, finally an excess of iron pyrites.

In North Carolina

There are but few mines working, which are coal and mica. All the Southern mine holders are flattering themselves with a hope that capitalists will come from the North and develop their mines—hence their cry, "come and help us." Unfortunately for them the West has the precedence and thither will the capitalists go.

Miners in the East.

I am pleased to relate that capitalists have displayed better judgment in carrying on their mines East than they have generally done, when investing west. Of course there are a few exceptions, but the majority of the superintendents are truly practical miners who commenced life by excavating the secreted treasure of the earth for a livelihood and having worked their way to the summit of their ambition, there is no trembling or rapid pulsation of the nerve when a stranger arrives at their works for fear of being questioned. Notwithstanding they have not been taught at the "school of mines," where theories appertaining thereto, in many instances, are nearly as vague and unsatisfactory as astronomy was in the days of Galileo, but have been taught by experience in the laboratories of Nature—where all who desire to become useful and economical servants for mining proprietors must be trained, notwithstanding other assertions. Neither must it be believed that all men who have labored in mines from their youth up are adequate for the undertaking and carrying out of mines properly; perhaps, not one in fifty or even a hundred are trustworthy.

Mining Management.

Yet rarely those who are intelligent and competent—having passed their whole lives in the one occupation—should be taken in preference to those who have spent their life behind the counter of a dry goods establishment, or four years (equivalent to two years of a miner's observations) at a "school of mines," as we have frequently seen in our wanderings. Suppose an incompetent person were put captain of a ship, and that ship became wrecked through his ignorance, would the material which composed that ship be censured? No; but the captain in charge—but this is not the case in mining—it is the non-productiveness of the vein, etc. (alas! ignorance of its captain in many cases) that produces failure. Sometimes it is asserted that so and so will do very well for to manage mines if he can get a good, intelligent "boss." That is another delusion—ridiculous in the extreme—for of what use is he there, if the boss performs the duty incumbent? He is nothing but a drone on the company or part of it, because he must have influential friends to keep him there, not a good mining reputation. Such men like to make a display of buildings, etc., at surface,

meantime negligent of the development of the mine—or see a company I know who had \$45,000 expended at surface and \$5,000 under ground and then abandoned it for lack of funds—having paid that sum to learn that a miner understood mining better than a salesman from a dry goods establishment. Not only American capitalists act thus ignorantly but English also. I know some of the best direct from England to the West to take charge of mines who, at the same time sorely knew a mine from an extinct volcanic crater. Then, what can be expected of such but failures? Yet they are not censured; but the veins, formations, etc.; in fact, the whole region round about.

There is Another Error

Which many of the greatest experts have made. Is it possible that a stranger can enter a large mine, or even a small one, and report in favor of, or against it, by being ushered through it every part in a few hours? Experience says not. He may be, as a mining engineer remarked to me a few months since, "I have been very lucky; I generally guess right!" This gentleman was brought up at a mining school; so he told me. A gentleman like Prof. Silliman may enter a mine and give his report in "tee, idee, 'ice and 'ers—words foreign to the masses of the people, yet this does not demonstrate the fact that his opinion is preferable to a report of an honest, intelligent miner. Can you tell a dozen of instances in the West where the erratic geologist ever placed a miner to work which proved profitable? I think not; but the miner has first to discover, then the geologist follows and relates how it came there.

T. S.

SILVER AND COPPER SMELTING WORKS AT TUCSON.—The Tucson Citizen of the 27th ultimo contains the following: Furnaces are being erected six miles south of Tucson for the purpose of smelting silver and copper ores. Old smeltworks and smelting works are to be seen at this place that were erected and successfully operated years ago, but the Apaches constantly levied contributions upon the horse and mulee in use, and one by one murdered the employee and owners, until the works were abandoned. We understand that Messrs. Simpson & Meyers have made a contract for smelting some ore from their mine, and are now preparing to haul the ore to the furnace. Smelting will soon commence in Sierra District. Some of the ore from that district recently taken to Mexico and smelted, paid \$1 per pound in silver. Thomas Yerkes, Superintendent of the Patagonia mine, is piling up crude bullion mountain high. Unless some arrangements are soon made to freight it away, he will get so much of it on hand that he will have to wait until the railroad is completed.

BRAZILIAN DIAMOND MINING.—The Anglo-Brazilian Times of April 23d says: The large bands of garimpeiros, who this year equated on the diamond and gold lands leased by various companies and individuals, in the district of Diamantina, Bahia, and were maintaining forcible possession of washings, had been, at last, driven from their usurpations by a body of soldiers sent up for the protection of the lessees. A Rio correspondent of a Buenos Ayres paper, reported this one of many repeated conflicts between the lessees and the gold and diamond squatters as an insurrection of an Indian tribe of 3,000 men! Much enmity exists between the companies and the garimpeiros, the latter objecting to the practical monopoly of the good washings and accusing the authorities of unduly favoring the great miners. Hence the frequent illicit squatting on the leased lands and periodical disturbances, sometimes requiring bodies of troops to effect wholesale evictions from the squattings.

THE SAN FRANCISCO MINT has coined during the fiscal year the sum of \$17,061,500, of which \$94,500 was silver and the remainder gold. In July the sum coined was \$2,245,000; August, \$730,000; September, \$1,264,500; October, \$1,895,000; November, \$1,525,000; December, \$1,436,600; January, 1873, \$900,000; February, \$1,219,400; March, \$1,140,000; April, \$1,282,000; May, \$2,772,000; June, \$652,000. The total coinage for previous year was \$18,745,500, of which \$955,500 was silver and \$17,790,000 was gold. The sum of \$8,700 was turned out in dollar pieces.

UNNECESSARY ASSESSMENTS.—The Pioche Record hears that public meetings of resident stockholders of several mines are suggested to take action against Trustees levying assessments when the corporations they represent have, or ought to have, money in their treasury. The plan is to secure co-operation with foreign stockholders, through correspondence.

THE RAYMOND & ELY mine is said to have about \$800,000 in its treasury, or \$26.33 per share. The Record says the amount due shareholders is increasing at the rate of \$5 per share per month.

A WIRE TRAMWAY, Hallidie's patent, one and a quarter miles in length, has been contracted for and will be put up on the Chicago Silver Mining Company's property in Utah.

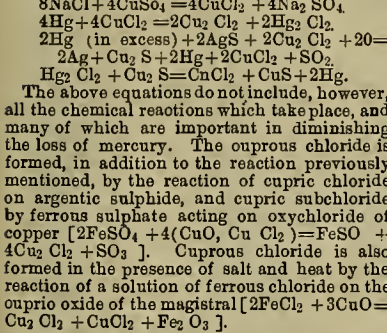
A RICH gravel claim has been struck in the vicinity of South Fork, Enreka Township, Nevada county in this State. The yield is half an ounce a day to the hand.

PROSPECTORS from Grant District have brought into Pioche rich looking specimens of free milling ore.

SCIENTIFIC PROGRESS.

Theory of the American Amalgamation.

This *Berg-und Hüttenmännische Zeitung* publishes a paper devoted to combating the views advanced by De Visl in the same journal for 1870. According to Gruetzner, the magistral is the chief agent in inducing the commencement of the amalgamation, and the mercury is the principal reducing agent. The surface of the silver particles is converted to argentic chlorides by salt, and this former is reduced by mercury, $2AgCl + 2Hg = Hg_2Cl_2 + 2Ag$, and the pure silver beneath the chloride at once amalgamates with the mercury. This mercury promotes the reduction of cupric chloride to cuprous chloride, and is changed, in small quantities, to mercurous chloride, which exerts the same reaction as cuprous chloride on silver and its compounds. It also reduces the cupric oxide, which is constantly striving to form and which is able to convert even silver suboxide, to cuprous oxide, chiefly in the presence of a concentrated sodium chloride solution, and decomposes it, being aided in this by the concentrated lye. The mercury also reduces the argentic sulphide, with formation of sulphuric acid, to metallic silver, which last is absorbed by the mercury as soon as formed, while the sulphuric acid set free decomposes the sodium chlorides, which aids very much the completion of the process. Consequently, the practice of the American amalgamation depends more on an exposure of the surface of the metallic silver (in decomposed ores) and decomposition of the argentic sulphide to metallic silver than on the formation of argentic chloride. This theory is supported by the unusually favorable action produced by the addition of metallic copper, or still better, copper amalgam. The reactions are: $20 + 2Cu_2Cl_2 = 2CuO + 2CuCl_2 + 2Hg + 2CuO$ (striving to form) $= Cu_2O + H_2O$; $Cu_2O + H_2O + 2AgS = Cu_2S + SO_2 + 2Ag + 2Hg$, and the amalgamation takes place thus: $2Hg + 2AgS + 2Cu_2Cl_2 + 20 = Cu_2S + 2Hg + 2Ag + 2CuCl_2 + SO_2$, the last being converted by the air and oxychloride of copper to sulphuric acid. The excess of mercury or of silver amalgam formed in the patio acts—after exciting electrochemical activity, in consequence of friction, of contact, and of the action of the cupric chloride under the influence of some chlorides—in such a manner as to form sub sulphide of copper, sulphuric acid, cupric chloride, and metallic silver thus:—



The Most Dangerous Explosive in the World.

Hydrogen and oxygen can be liquified together by simply burning the hydrogen in the oxygen, or vice versa; the result is of course water. But if we could succeed in liquifying a mixture of the two gases in the proper proportion by mere pressure, or any chemical means, without combustion, we would obtain a most violent explosive, as then all the latent heat of dissociation would be set free at the moment of ignition, and starting from a very concentrated spot, the expansion of the gaseous product would take place with the most enormous rapidity. Similar conditions are met by nearly all explosives in which the active materials are more or less diluted with other ingredients. In gunpowder the carbon and sulphur are in close proximity to an amount of oxygen sufficient for the complete combustion. This oxygen is in the nitre, in which it is kept by the potash and nitrogen, which latter two only dilute the force of the compound, but are necessary to keep the oxygen in the solid state. It is the same with gun-cotton, in which the carbon and hydrogen are the combustibles, while nitric acid is combined with them in sufficient amount to furnish all the oxygen needed for their combustion. Nitroglycerine belongs to the same category, while the compounds made from it, as dynamite, giant's powder, etc., are merely diluted nitroglycerine, in which the force is diminished to some extent by foreign ingredients, in order to obtain other advantages desired in some circumstances. But there are other supporters of combustion than oxygen; such are the so-called halogens: chlorine, bromine, iodine, the affinity of which to hydrogen is very great. In supporting the combustion of this element they develop a great heat, and form respectively hydro-

chloric, hydrobromic, and hydroiodic acids. This mixture of chlorine and hydrogen gas explodes much easier than that of oxygen and hydrogen. Mere exposure to the solar rays is sufficient to ignite it; and it is this mixture, when liquified to an oily consistency, which is the most dangerous explosive in the world. It cannot, however, be produced by direct compression, but by chemical agency; and here again the nitrogen is used, as in the former explosives, to hold the two elements close together, without that they have given of their latent heat of dissociation by combustion.—*Manufacturer and Builder.*

Creation.

The scientific theory that creation and annihilation are impossible, and that the laws of nature are immutable, is not in accordance with exact science, and is, therefore, an error; for every change is only annihilation of the old and creation of the new; and every progressive step, whether universal or local, is the repeal of an old law, and the enactment of a new and better one. What we are cognizant of as the physical universe is not matter itself, but the force which actuates it, and variety of quality in matter, is only variety of molecular motions. Therefore, as changes of color occur by refraction; of taste, by chemical action, and sound, by length of rhythms, so all creations of which we are truly conscious, are but modes of motion, undergoing constant annihilation and re-creation.

Nothing, then, in the physical universe is immutable but elementary motion and matter, being wholly imperceptible to mental sense, is rather an immutable principle in nature than a creation; for how can we conceive of a thing of which we cannot be cognizant. And the only immutable principle in natural law is, that motion inevitably takes the direction of least resistance.

All physical things then, of which we are conscious, being modes of motion, creation consists in forming such channels of least resistance as produce those modes of motion which effect consciousness as physical qualities. This being the only definition of creation, which harmonizes with exact science, is the datum from which true ideas of the creator may be formed.

Science has taught us that the potency of wisdom is superior to physical power, and is competent to resist and change the directions of physical motions; it, therefore, logically follows that Supreme Wisdom is the creator of those intelligent modes of motion which constitute the concrete universe of animate and inanimate matter, the scrutiny of which is scientific research, and the knowledge gained thereby is exact science.—*Am. Artisan.*

THE MANAGEMENT OF AQUARIA.—The walls of aquaria, exposed to light, become covered with a growth of cryptogamous vegetation. M. Charbonnier has observed that sometimes two or three days are sufficient for the full growth of this green moss, while at other times it hardly appeared in eight or ten days. He has noticed that every month, at the time of full moon, the vegetation has its maximum of intensity, and it is almost nil at new moon. At full moon a daily cleaning is needed; whereas, this period over, cleaning twice a week will be sufficient. M. Charbonnier has also made observations on the germs of microscopic ferns in water coming to his reservoirs from the Ourcq, in Paris. This water passes a considerable distance in the open air.

Now, the quantity of these germs is found to be very variable, and it is greatest at the time of the full moon. The explanation he suggests for such a curious phenomenon is as follows: Vegetable germs lying at the bottom of a stream are raised in sunlight by the gas bubbles, they then give off in respiration, and which continue some time attached to them. When night comes on the bubbles disappear, and the plants sink again; but if there is strong moonlight the production of gas continues, and they are kept floating; hence the superabundance met with at full moon.

IGNITION BY SUPERHEATED STEAM.—In view of the interest lately manifested with regard to ignition by superheated steam, a correspondent of the *Scientific American*, from Frankfort, Ky., sends that journal the following singular fact which recently occurred under his own experience. He says:—"I had prepared some gun cotton, and after washing it a little from the acids, I laid it on the T joint of a steam pipe to dry, 80 yards distant from the boilers; the pipe runs 40 yards of the distance under ground. In about three minutes, there was a flash like lightning; the cotton I laid on the T joint had exploded by spontaneous combustion."

I have often seen cotton yarns and raw cotton, that have been dyed with sulpho-nitrates and nitro-muriates, ignite in a few hours, being in contact with superheated steam pipes. May not wood, under certain circumstances, absorb inflammable gases, and thus be rendered more liable to spontaneous combustion?"

SAVING THE CAFFEINE IN ROASTING COFFEE.—It is proposed to save the caffeine, the most of which is now wasted in the process of roasting coffee, by attaching a condenser to the roaster. A pound of coffee will yield an average of about 75 grains of caffeine. As the annual consumption in this country amounts to some 25,000 tons; if this saving could be effected on all the coffee roasted, it would amount to about 375 tons annually of this most valuable part of the berry.

MECHANICAL PROGRESS.

Sulphur and Phosphorus in Iron.

The worst comparative feature of American pig iron is the sulphur, which averages 0.207 in the American, against 0.035 in the English Cleveland, or nearly six times as much; while the other general enemy, phosphorus, stands at 0.16 in the American, and 1.27 in the English—I. e., nearly eight times as much in the latter. The relations of these are thus reversed, and this reversal corresponds with that of their detrimental importance in the manufacture of rails, plates, etc., of the past and those of the future. Sulphur is the old enemy of the puddler, and the great enemy of the modern manufacturer of Bessemer work, and of all other steel, is phosphorus. The difference is of considerable practical importance.

Although the best of all pig for Bessemer work is that which contains neither phosphorus nor sulphur, or the smallest possible quantity of each, there are good reasons for believing that where a notable quantity of phosphorus is present, a balancing proportion of sulphur is rather beneficial than injurious. Thus, a pig containing, say, 0.15 per cent. of sulphur and 0.12 of phosphorus, would make better Bessemer rails, tires, etc., than another pig containing 0.12 of phosphorus and no sulphur, other constituents being the same.

This future development of iron manufacture is evidently in the direction of substituting semi-steel—such as is now produced by the Bessemer process—for ordinary puddled iron. The superiority of Bessemer rails and their greater practical economy is fully established. Whenever these are laid down, tires of equal, or greater hardness, become indispensable, thus two of the heaviest elements of railway plant are demanded. As the skill of the Bessemer workers improve, and they go on vanquishing their chief difficulty by securing a more reliable homogeneity and constancy of composition, the applications of Bessemer steel must extend to boiler plates, ship plates, angle and T iron, to engine shafts, to girders, to bridges, and all other structures and elements of structure where strength of material and economy of weight are demanded.

CAST IRON ENAMELING.—A great improvement is effected in pump cylinders of cast iron by the process of enameling, and the following method of treatment has recently been recommended as the most simple and practicable for accomplishing the purpose.

To separate the graphite, they are laid for two or three hours in an acid bath, and then well washed off with water and brushes. A mass consisting of thirty-four parts quartz, fifteen parts borax and two parts carbonate of soda, is then uniformly spread on; the pipes are then heated for ten minutes in a muffle of a semicircular cross section, three feet wide and nine feet long. They are then withdrawn, cooled, and coated uniformly with a glazing composition consisting of thirty-four parts feldspar, nineteen parts quartz, twenty-four parts borax, sixteen parts oxide of tin, four parts fluorspar, nine parts carbonate of soda and three parts nitre. The mass is prepared by melting the materials together in a crucible and then grinding them in a mill, with the addition of water. After the cylinders have been covered with the glazing, they are heated in a muffle to a white heat for twenty minutes, and are then withdrawn and coated with coal tar before they are cold.

REVERSING GEAR.—Considerable inventive genius has been expended of late in devising some method whereby the shocks arising from reversing rolling-mill gear and other heavy machinery where clutches are employed, may be, to a certain extent, obviated. One of the latest and most promising devices proposed was recently made by Mr. Jeremiah Head, and described in a paper read before the Iron and Steel Institute, at London, (Eng.). His plan is to make arms of flat-plate springs, laid up in leaves like those of car-springs, with this exception, that the leaves are straight, instead of bent, as in the ordinary car-spring. It is evident that, on this plan, if the center of the wheel be suddenly checked in its motion, the rim will advance in its revolution to an extent limited by resiliency of the spring arms.

Mr. Head went through elaborate mathematical calculations to show that the strength and resiliency of these spring arms would be ample for the purpose, and he gave diagrams illustrating the details of the construction.

IMPORTANT MINERAL DISCOVERY IN ENGLAND.

Extensive discoveries of Speigle iron ore have recently been made in North Devonshire, Eng., on the line of an important railway. This discovery is especially important when considered in connection with the manufacture of Bessemer steel, as hitherto the chief part of the Speigleisen, for the English furnaces have been derived from Germany, and the increasing demand therefore, and short prospective supply of the ore has increased its value at Rotterdam, from about \$30 to \$75 per ton. Hence, any new deposit of ore suitable for the production of Speigleisen is of the utmost importance to the steel stock. Speigleisen is employed for carbonizing in the Bessemer converter.

GUNS AND GUNPOWDER.—This problem of throwing the largest possible projectile with the greatest possible velocity, must be solved in one of two ways, either to strengthen the gun or so modify the powder that the cannon can stand the discharge with less strain.

The first method has been the one generally adopted, until this utmost practical limit in that direction has been about reached, and engineers are now turning their attention to the second proposition. Mammoth powder was first introduced to reduce the rapidity of combustion and thus briag the pressure to bear on the projectile gradually. Though the mammoth powder reduced the rapidity of the combustion, the greatest pressure still existed when the projectile had moved only a short distance, and necessarily diminished with the diminished surface of the grain as the shot traversed the remainder of the bore; while the desirable object is to increase rather than decrease the rapidity of the combustion from the instant the shot commences to move.

To obtain this desirable result it is now proposed to make the powder in large grains with several preparations, by which a small surface will be presented at first, which will rapidly increase by having their walls burned away.

SCIENCE AT FAULT.—Soon after Mr. Bessemer commenced his experiments, it was found that certain qualities of pig iron were utterly unfit for his process, and in this way scientific enquiries became inevitable in order to discover the cause. The chief source of trouble was traced to the presence of phosphorus, and next followed sulphur. It was then proved that if the former exceeded .06 or .07 per cent., the iron containing it had to be rejected. No sooner was the evil influence of these two substances detected than any number of (so-called) specifics were proposed to eliminate them from the iron, more thoroughly than could be done in the ordinary puddling furnace. But as yet no marked progress has actually been made, and Mr. Bessemer has to confine his process to iron produced from ores which contain no sulphur.

It is hoped, however, that as our knowledge of the chemical relations which exist between iron and other substances advances the great problem of eliminating those enemies to iron above named may be satisfactorily solved, so that all classes of ores of iron may be economized by this truly wonderful process of conversion. Such a result, however, will be accomplished only at the expense of long and patient study and experiment.

AMERICA ACKNOWLEDGES TO BE ENGLAND'S RIVAL.—I. Lowthian Bell, in his address to the members of the English "Iron and Steel Institute," said: "It is not the old world of Europe we have to fear, but the immense and undoubted powers possessed by the western hemisphere. In ores of the finest description, the resources of the United States are unlimited, while in coal our own wealth is, in comparison, but poverty." "In the matter of skill, every one who has had the opportunity of inspecting the American iron works concurs in reporting that their development is quite in keeping with the advantages Nature has conferred upon that highly favored country."

IRON SHIPS WITHOUT SEAMS.—A mechanic in Philadelphia proposes to build steamships of one solid piece of iron or steel, without seam or joint. This he accomplishes by welding the plates and frame, instead of using bolts or rivets. He claims that he has invented machinery by which the thing can be done, at a great saving of cost, of weight and of time, and with a great gain of strength and durability.

COMPRESSING MOLTEN STEEL.—It is found necessary, in order to remove the air cells from molten steel by Whitworth's plan, to subject the fluid metal to a pressure of twenty tons to the square inch. Steel so compressed has been found, without further treatment, to bear fully double the terrible strain of the best iron made after the ordinary manner.

RAPID WORK.—One of the small engines employed to drive the machinery in the American Department at the Vienna Exhibition was lying at the works in pigs only twenty days before the vessel sailed by which it was taken to Europe. The engine has a 12-inch cylinder with 24-inch stroke, and was constructed at the Norwalk Iron Works, New York.

DURABLE CRUCIBLES FOR MELTING STEEL.—Such crucibles are prepared from a mixture of 10 parts ground and washed chamotte, 10 graphite, 15 asbestos, 3 quartz (not too finely powdered) and 22 fireproof clay. The asbestos, as a fibrous body, prevents the falling asunder of the crucible when cracking, and thus any loss can be prevented.

"INDURATED TAR," whatever that may be, it is claimed, does not crack, shrink, nor blister, and on that account it is thought would be well adapted for coating iron vessels. It is now being tested for that purpose in a British Government dockyard.

GLASS-LINED WATER PIPES, already alluded to in these columns, are being generally introduced into the dwellings of New York city. These pipes are, of course, free from the objections peculiar to all-lead pipes.

THE heating of buildings by hot air was practiced in Germany nine centuries ago. It is not, therefore, a modern idea, as is generally supposed.

Table of Fluctuations.

Showing Highest and Lowest "Regular" Sales of Mining Stocks on the Board List of the San Francisco Stock and Exchange Board, during the last Four Weeks, together with Number of Feet, Shares, Last Dividends and Assessments.

NAME OF COMPANY	FEET IN MINE.	SHARES IN MINE.	LAST DIVIDEND.	LAST ASSESSMENT.	1873.								
					WEEK ENDING				HIGH	LOW	HIGH	LOW	
					May 24	May 31	June 11	June 16					
WASHOE.													
Alamo Gold and Silver M. Co.	300	6000		5, Mch. 1, '71	40	33	35	31	35	27	34	75c.	75c
Alpha Consolidated.	3600	36000		1, May 1, '73	134	54	54	4	54	234	61	61	2
Alta.	1900	19000		27, July, '71	1	2	5	4	4	4	4	4	2
American Flat.	65	2400		4, Feb. 15, '73	1	1	1	1	1	1	1	1	1
Bacon Mill and Mining Co.	100	2000		3, June 3, '73	87	80	104	86	111	79	84	90	86
Baltimore Consolidated.	1040	10400		15, June, '72	87	80	104	86	111	79	84	90	86
Belcher.	224	2240		8, Feb. 7, '71	1	1	1	1	1	1	1	1	1
Best & Belcher.	20	500		7, Jan. 21, '73	11	11	11	11	11	11	11	11	11
Bowers.	2500	25000		45, Aug. 6, '72	24	17	25	19	26	18	18	18	16
Bullion.	5000	50000		4, Feb. 5, '73	6	6	6	6	6	6	6	6	6
California Silver Mining Co.	150	1500			18	17	18	17	18	17	18	17	16
Central.	100	2000			2	2	2	2	2	2	2	2	2
Central Co. Two.	2800	28000		39, Feb. 7, '72	6	6	6	6	6	6	6	6	6
Chollar-Potosi.	130	2450		6, May, '65	6	6	6	6	6	6	6	6	6
Confidence Silver Mining Co.	2000	20000		10, Mar. 18, '73	9	9	9	9	9	9	9	9	9
Cons. Gold Hill Quartz.	1168	2336		15, June 11, '73	70	71	94	80	102	90	95	88	88
Consolidated Virginia.	1680	3360		1, Sept. 4, '72	50	50	50	50	50	50	50	50	50
Cook & Geyer.	600	12000		31, June, '73	126	117	140	117	135	116	117	97	97
Crown Point Gold and S. M. Daney.	200	4000		2, July, '68	1	1	1	1	1	1	1	1	1
Dardanelles.	1200	24000			1	1	1	1	1	1	1	1	1
Eclipse.	70	2500		21, May, '67	1	1	1	1	1	1	1	1	1
Empire Mill and Mining Co.	400	8000		13, June 10, '73	1	1	1	1	1	1	1	1	1
Eschbacher.	3000	30000			3	3	3	3	3	3	3	3	3
Flower.	100	2000			3	3	3	3	3	3	3	3	3
Franklin.	1200	24000		2, Jan. 7, '73	3	3	3	3	3	3	3	3	3
Globe.	1200	24000		36, Oct. 70	114	124	155	114	174	124	15	10	10
Gond & Curry Silver Mining.	400	16000		36, April, '71	51	42	56	48	57	42	45	38	38
Imperial.	184	10000		30, June, '68	16	16	16	16	16	16	16	16	16
Indus.	2000	30000		16, Apr. 8, '73	7	7	7	7	7	7	7	7	7
Julia Gold and Silver M. Co.	2000	20000		14, June 9, '73	10	10	10	10	10	10	10	10	10
Justice.	3000	30000		14, June 9, '73	10	10	10	10	10	10	10	10	10
Kentuck.	1200	24000		5, Mch. 24, '73	6	6	6	6	6	6	6	6	6
Kickerhook.	3600	36000			1	1	1	1	1	1	1	1	1
Lady Bryan.	3600	36000			1	1	1	1	1	1	1	1	1
McMeans.	3600	36000			1	1	1	1	1	1	1	1	1
Mint Gold and Silver Mining.	3600	36000			1	1	1	1	1	1	1	1	1
New York Consolidated.	3600	36000			1	1	1	1	1	1	1	1	1
Occidental.	3600	36000			1	1	1	1	1	1	1	1	1
Ophir Silver Mining Co.	1200	24000		26, June 4, '73	45	40	51	40	55	32	34	34	34
Phil. Sheridan.	2000	20000		2, Feb. 14, '73	1	1	1	1	1	1	1	1	1
Pictou.	2000	20000			1	1	1	1	1	1	1	1	1
Rock Island.	800	16000		52, June, '68	130	105	138	120	160	128	147	110	110
Segregated Belcher.	160	6400		14, July 20, '71	47	32	60	50	51	40	53	47	47
Segregated Caledonia.	1000	10000		2, Feb. 11, '73	1	1	1	1	1	1	1	1	1
Sierra Nevada.	20000	400000		11, Jan. 71	13	15	15	12	14	12	12	11	11
Sierra Nevada.	20000	400000		1, Dec. 24, '72	26	19	24	20	25	19	22	10	10
Sutro.	2000	40000		1, Dec. 24, '72	34	23	3	3	2	2	2	2	2
Trench.	200	4000		2, Oct. 71	5	5	5	5	5	5	5	5	5
Tyler.	224	4480		3, June 13, '73	6	6	6	6	6	6	6	6	6
Union Consolidated.	803	20000		2, May 6, '73	1	1	1	1	1	1	1	1	1
Utah.	20000	400000		2, May 6, '73	1	1	1	1	1	1	1	1	1
Woodville Gold and S. M.	1400	28000		15, Jan. 4, '73	5	5	5	5	5	5	5	5	5
Yellow Jacket.	1200	24000		25, Aug. 71	79	79	0	75	84	66	68	61	61
NEVADA.													
Adams Hill.	5000	50000		3, Dec. 23, '72	1	50	1	1	1	1	1	1	1
Alps Silver Mining Co.	800	30000		4, May 6, '73	2	14	1	1	1	1	1	1	1
Amador Tunnel and Mining.	500	5000		1, June 4, '73	3	3	3	3	3	3	3	3	3
American Flag Mill and M.	300	30000		1, June 4, '73	3	3	3	3	3	3	3	3	3
Arkansas.	300	30000		1, June 4, '73	3	3	3	3	3	3	3	3	3
Belmont.	3000	30000		3, Jan. 18, '73	5	45	5	45	5	45	5	45	5
Bowery.	3000	30000		3, May 5, '73	7	50	7	50	7	50	7	50	7
Chapman Mill and Mining.	1000	30000		1, Mch. 3, '73	5	50	5	50	5	50	5	50	5
Chief of the Hill.	3000	30000		2, May 23, '73	3	2	2	2	2	2	2	2	2
Chief East Extension.	3000	30000		2, May 23, '73	3	2	2	2	2	2	2	2	2
Columbus Mill and Mining.	10000	200000		2, April 26, '73	50	40	25	20	20	10	10	10	10
Condor.	5000	50000		1, Sept. 12, '72	13	12	15	11	13	10	13	12	12
Eureka Consolidated.	12000	240000		5, June, '73	13	12	15	11	13	10	13	12	12
Excelsior.	12000	240000		1, June 20, '72	1	1	1	1	1	1	1	1	1
Harper Silver Mining Co.	10000	200000		1, June 20, '72	1	1	1	1	1	1	1	1	1
Hermosa.	10000	200000		4, May 10, '73	12	9	10	8	9	6	8	6	6
Home Tunnel.	3500	30000		6, May 12, '73	2	2	2	2	2	2	2	2	2
Huhn & Hunt Silver Mining.	1000	20000		6, May 12, '73	1	1	1	1	1	1	1	1	1
Ingon Silver Mining Co.	1000	20000		6, May 12, '73	1	1	1	1	1	1	1	1	1
Ivanhoe.	3000	30000		2, Dec. 12, '72	40	25	35	25	30	25	3	2	2
Jackson.	5000	50000		5, Mch. 24, '73	40	25	35	25	30	25	3	2	2
Junata Consolidated.	5000	50000		5, Mch. 24, '73	40	25	35	25	30	25	3	2	2
Kentucky Gold and Silver.	1000	20000		1, Aug. 26, '72	2	2	2	2	2	2	2	2	2
Kingston.	1000	20000		1, Aug. 26, '72	2	2	2	2	2	2	2	2	2
Leligh.	1000	20000		3, Jan. 22, '73	40	40	40	40	40	40	40	40	40
Louisa.	1000	20000		3, Sept. 15, '72	40	40	40	40	40	40	40	40	40
McMahon.	1000	20000		3, Feb. 24, '73	40	40	40	40	40	40	40	40	40
Marion.	1000	20000		3, Feb. 24, '73	40	40	40	40	40	40	40	40	40
Meadow Valley.	2023	60000		16, June, '73	23	18	25	20	23	21	23	21	21
Mocking Bird.	1000	20000		7, May 30, '72	4	4	4	4	4	4	4	4	4
Monitor Belmont.	2000	40000		2, Mch. 7, '73	1	1	1	1	1	1	1	1	1
Murphy.	2000	40000		4, Apr. 10, '73	1	1	1	1	1	1	1	1	1
Newark Silver Mining Co.	1000	20000		3, Feb. 3, '73	2	1	1	1	1	1	1	1	1
Pacific Tunnel and Mining.	2400	48000		10, April 11, '73	40	40	40	40	40	40	40	40	40
Page & Panaca Silver Mining.	2400	48000		10, April 11, '73	40	40	40	40	40	40	40	40	40
Peavine.	2400	48000		10, April 11, '73	40	40	40	40	40	40	40	40	40
Pioche Silver Mining Co.	1000	20000		3, Ang. 7, '72	10	9	10	9	10	9	9	8	8
Pioche West Extension.	1000	20000		3, Ang. 7, '72	10	9	10	9	10	9	9	8	8
Pioche-Phoenix.	4000	80000		3, May 6, '73	2	2	2	2	2	2	2	2	2
Portland.	5000	100000		3, May 6, '73	2	2	2	2	2	2	2	2	2
Raymond & Ely.	3000	30000		22, Feb. 7, '73	53	53	51	51	51	51	51	51	51
Silver Peak.	3000	30000		2, April 3, '73	1	1	1	1	1	1	1	1	1
Silver West Consolidated.	3000	30000		4, June 10, '73	5	5	5	5	5	5	5	5	5
Stoddard Mill and Mining.	18000	360000		1, May 16, '73	50	50	50	50	50	50	50	50	50
Star Consolidated.	6900	25000		1, Nov. 1, '72	50	50	50	50	50	50	50	50	50
Starlight.	6900	25000		1, Nov. 1, '72	50	50	50	50	50	50	50	50	50
Sterling.	6900	25000		1, July 15, '72	50	50	50	50	50	50	50	50	50
Spring Mount.	6900	25000		2, Jan. 15, '73	100	100	100	100	100	100	100	100	100
Spring Mountain Tunnel.	20000	400000		5, Mch. 13, '73	2	2	2	2	2	2	2	2	2
Yellow Beecher.	200	30000		8, April 25, '73	2	2	2	2	2	2	2	2	2
Washington and Creole.	200	30000		8, April 25, '73	2	2	2	2	2	2	2	2	

Our Weekly Stock Review.

THURSDAY EVE, June 19, 1873.

There has not been very much doing in the Stock Market this week. There has been so much decline in business of late that the Board has resumed 11 o'clock as the hour of meeting. Our Comstock letter in another column will give a good idea of the state of things in that locality. The Crown Point and Belcher mines which combined have paid \$2,040,000 in dividends this month are still improving. The usual quantity of ore was not raised from the former last week on account of the breakage of the main spur wheel of the hoisting gear. The pattern in this city was destroyed by fire recently, so it will take nearly two weeks to replace the wheel. The controversy between the Eureka Consolidated and the Richmond Mill & Mining Co. has been compromised by the payment of \$85,000 by the latter Co. for the Lookout Ground. The Eureka Consolidated declares a dividend of \$1, payable on the 24th inst.

As showing the rapid quarterly increase in ore production and value of ore in the two leading Comstock mines the following official returns from the assessment rolls of Storey County is interesting:

1871.	Belcher.	Crown Point.	Pr. ton.	Val.	Val. Tons.	Pr. ton.	Val.
Quarter to	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.
March 31....	279	1,034	5,908	\$125,574	\$11 28	53 42	
June 30.....	18,972	719,122	37 81				
September 30	2,680	212,038	17,240	\$26,885	30 56		
December 31	15,790	985,848	17,828	\$59,924	33 65		
1872.							
March 31....	20,998	1,071,350	19,121	\$1,030,149	53 42		
June 30.....	21,932	1,203,037	35,183	\$1,739,746	50 10		
September 30	17,431	1,015,414	33,379	\$1,041,475	32 16		
December 31	23,131	1,504,858	24,079	\$67,478	31 70		
1873.							
March 31....	30,926	2,055,896	43,108	\$2,405,211	57 80		

Two months of the June quarter already show an increase over the production of the total quarter ending March 31st, and the product will probably double the latter.

We have had quite a number of assessments this month, but the dividends far exceed their amount. Three new companies, the Black Bear Quartz, K. K. Consolidated and La Grange, declared their first dividends and the Meadow Valley and Eureka Consolidated have come in the dividend paying list again. These, in addition to the large dividends of the Crown Point and Belcher, foot up a goodly sum. The eight dividends this month are as follows:

NAME.	PER SHARE.	AMOUNT.
Belcher.....	\$10.00	\$1,040,000
Black Bear Quartz.....	50	15,000
Crown Point.....	10.00	1,001,000
Eureka.....	1.00	20,000
Eureka Consolidated.....	1.00	50,000
K. K. Consolidated.....	25	7,500
La Grange.....	25	7,500
Meadow Valley.....	1.00	50,000
		\$2,200,000

The following assessments were delinquent in June:

Name.	Per Share.	Amount.
American Flat.....	50	\$15,000
Alpine.....	\$1.00	12,000
Alps.....	50	15,000
Bowery.....	50	15,000
Golden Charlot.....	2.00	20,000
Hayes.....	25	12,500
Hermes.....	3.00	90,000
Huhn & Hunt.....	1.50	45,000
Insurance.....	25	7,500
Minnesota.....	1.50	30,000
Mint.....	10	3,000
Mazappa.....	50	15,000
Noonday.....	25	5,000
Peavine.....	25	7,500
Pioche-Phoenix.....	1.00	40,000
Pioche West Extension.....	50	15,000
Regent Consolidated.....	10	3,000
Rising Star.....	1.00	10,000
South Charlot.....	50	10,000
Spring Mount.....	50	15,000
Standard.....	2.00	20,000
Utah.....	1.00	20,000

This list foots up the sum of \$430,500, while the dividends are \$2,200,000, leaving a balance of \$1,769,500 in favor of stockholders. The assessments and dividends since January have been as follows:

	—Assessments—		—Dividend—	
	No.	Amount.	No.	Amount.
January.....	24	\$550,950	5	\$573,181
February.....	30	636,000	7	819,000
March.....	36	681,950	5	811,000
April.....	18	338,860	4	1,980,000
May.....	20	616,900	3	1,872,000
June.....	22	450,500	8	2,200,000
Total.....	150	\$3,354,260	33	7,365,181

This leaves a balance of \$4,010,921 in favor of stockholders.

On Friday last the market was rather dull with the exception of Crown Point. At close compared with previous prices, Crown Point was \$3 lower on sales of 245 shares; Savage \$4; Belcher rose \$2; Hale & Norcross \$1.50; Meadow Valley \$1; Yellow Jacket \$1.50; and Ophir \$1.

Saturday showed another weak market except for Crown Point, the low price of which brought in buyers. At the close prices showed a very general decline: Belcher 3; Ophir 3; Hale & Norcross \$4; Kentucky \$1; Ophir \$1; Overman \$2; Savage \$2; Crown Point rose \$1, and after the Board \$104 was bid.

On Monday the market was stronger than on Saturday and Crown Point rose \$10. The break in this stock was explained by the fact that the stock of Mr. Patten, deceased, consisting of 2,700 shares was thrown in the market at a sacrifice. The mine looks better than ever. At close Belcher was \$1 higher than on Saturday; Chollar \$5; Con. Virginia, \$5; Gould & Curry, \$2; Hale & Norcross, \$4; Kentucky, \$5; Overman, \$3; Savage, \$20; Seg. Belcher, \$5; Jacket, \$4.

On Tuesday the market was rather quiet; but prices for most kinds were better. Wednesday showed a weak market and a decline in prices.

To-day the market was weak and prices irregular; a decline is apparent; closing prices may be seen by reference to our stock tables.

The following items of interest from prominent mines are collated from letters or telegrams from superintendents on file at the offices of the respective companies in this city.

Crown Point.

Dispatch of the 18th says the crosscuts from third and still floor 1300-foot level, are both in porphyry. We are running a drill on the 1400-foot level. No change elsewhere.

Chollar-Potosi.

Letter of the 17th says during the 24 hours ending this morning, 152 tons 800 pounds of ore were taken from the mine. Average assay value of the same was \$32.40 per ton. Drift on fourth station has a better appearance in the face, the material is better, progress more rapid. Ore face and ore producing sections have changed more during the past 24 hours. Ore slips for the 15th were 181 tons, 1,650 pounds.

Caledonia.

Letter of the 17th says that since the last report no change has taken place in the ground in the main drift on the second station. The ground in the south drift is hardening considerably. The water is rising a little, and is hot troubling as much. The general work in and about the mine is going on as usual.

MINING SUMMARY.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned:

ALPINE COUNTY.

TABERNER.—Alpine Miner, June 14: Mint returns from the crude bullion sent down by Mr. Hunter from the recent short run at this mill, shows a much better result than was expected. The value of the bullion was \$392, and on a close calculation of expenses considerably over half a clear profit per yet used in hydraulic mining. Besides this Mr. Hunter has several tons of nice sulphurates saved, and altogether the result is so satisfactory that an increased force is to be put on the mine, and another run of the mill soon made.

STICKLES.—Calaveras Citizen, June 14: Word was received at Angels, from San Francisco, June 4th, to shut down this mine. On the day following, Thursday, a drift was started into the hanging wall, and they had not run more than 2 ft. before they struck the vein. This will be seen that the Company have been working within 2 ft. of the vein for the last two months. They have a vein over 8 feet wide, and are not through it yet. The rock shows free gold.

GAUNDALF.—This claim, situated at Robinson's Ferry, is looking well. The Company have a vein 8 ft. thick, showing free gold. We understand that Dr. Rodgers is there looking at the mine. The Co. intend erecting a mill shortly.

Bio Minx.—Rock in this claim, at Angels, is looking better, but continues hard.

COMET.—Last week the proprietors of this mine crushed 10 tons of rock, taken from their lead, which is situated about 1/4 mile from San Andreas. The rock was not as good as that from the lead, but it was very rich. The result was fully up to their expectations, and we are informed the rock paid \$20 per ton.

PLACER COUNTY.

DEUTER FLAT.—Placer Argus, June 13: The Staples Bros. have recently had manufactured about 3,000 ft. of new pipe, varying in diameter from 11 to 42 inches, for the Sunset claim. They have also one of Hoskin's Little Giants, and are at present working at the unusual and tremendous pressure of 460 ft., which will soon be increased to over 500 ft. This is without doubt the heaviest pressure ever used in hydraulic mining. Some idea may be formed of the tremendous force of the stream when it is known that a strong man cannot strike a crowbar through it. For the information of miners and others interested I would say that the heaviest iron used on the pipe is No. 16; riveted in a single row, rivets 1 inch apart.

Mr. Ludlum, manager for the English company, is engaged in clearing off, preparatory to raising a shaft in the Jehoshaphat claim, next to the Sunset here, also (as in the Sunset) in the prospecting of all parts of the ground about 80 ft. in the shallow part, and very much richer than any that has yet been washed in this claim.

The Miners' Ditch Company, of Old Run, have received their Burleigh drill and the machinery to drive it, and calculate when they get all set up and running to make a short job of their tunnel. When this tunnel shall have been completed and the bottom gravel in the Blue Lead commenced to be worked, then hydraulic mining will have been about commenced in this section. Some idea of the extent of the gravel deposit in this section may be formed when it is known that in the Cedar claim, which is on the lead, gravel of about an average depth of 175 ft. has been washed. Mr. Kipp, the present manager, is sinking a shaft, and is already down 100 ft., and the gravel is soft and prospects finely. Mr. Kipp does not anticipate striking bottom until he has reached a depth of about 230 ft.

SIERRA COUNTY.

FOREST CITY.—Downville Messenger, June 14: Since the success of the Bald Mountain Mining Co., Forest City has taken a new lease of life and prosperity. The Co. have been working from 60 to 80 men up to Saturday last week, when, it becoming evident that they would have hard work to do for the summer, they suspended work for a week to enable them to wash up their dirt, and enlarge their dump. A new reservoir has been put in at a cost of about \$1,200, which the water they now have fills some 7 times in 24 hours, each reservoir full, enabling them to run about 1 1/2 hours. When all their arrangements are completed they will be enabled to keep their water force working all summer.

The South Fork Co. have their new tunnel in about 100 ft., are pushing forward to pay gravel as fast as possible.

The North Fork are also well on their way to their lead. A new company has been formed to sink a shaft near the old Oalloway Ranch, for the purpose of prospecting for the extension of the Bald Mountain lead.

The Alaska Quartz Mine, at Pike City, which paid well as long as the machinery they had would keep the mine clear of water, is likely to be sold to parties able to put in heavier machinery. When this is done, it will be one of the best paying mines in the mountains. With a five-stamp mill, during the short time this work is done, it will do over \$30,000.

REPUBLICAN.—The Twenty-one Quartz Mill, near Alhambra, is running again, on rock taken out some time since, for the purpose of clearing it away to make room for further working. It is supposed the rock will pay.

TUOLUMNE COUNTY.

REPUBLICAN.—Tuolumne Independent, June 14: This mine (adjoining the Orcutt) has just cleaned up 30 tons, supposed to pay \$25 per ton.

SPRING GULCH.—For the month of May at the Spring Gulch mine the wash-up was 170 ounces.

GRIZZLY.—This mill is running Louisiana rock. The mine is being carried by by Maynard & Kimball, of San Francisco.

ORCUTT.—They are running a four-stamp mill, and are getting out rock from their chute that will pay \$200 per ton easy. They are down 60 ft. below water, where they are taking out their rock.

Nevada.

ELY DISTRICT.

SILVER PEAK.—Pioche Record, June 14: The work of grading for the machinery is about completed. There is now on the dump about 50 tons of assorted ore—first class, ready for shipment.

SPRING MOUNT TUNNEL.—Work on ledge No. 3, in this tunnel, is being prosecuted night and day, the shaft having reached the depth of 90 ft. since the resumption of work on the 23d of May last, with greatly improved prospects of soon reaching good ore. The ledge has steadily increased in width for the last 20 ft.

CHIEF EAST EXTENSION.—The main shaft is now 175 ft. below the 90 ft. level. The ledge at this point is 3 feet between the walls—well defined and showing some good ore on the foot-wall.

RAYMOND & ELY.—The hoisting works are in course of rapid completion. The foundation for the engine is the richest piece of workmanship. The engine to be next put up will be 80-horse power, and securely anchored. There is a large amount of ore on the dump.

MEADOW VALLEY.—Running about as usual. Now awaiting the arrival of another engine from San Francisco, which is expected soon. When it is received it will be placed on No. 3. Work will then be carried on on a more extensive scale. Even with one engine the Company sends off about \$5,000 in bullion daily.

ARIZONA.—Drifting steadily for the ledge from 300-ft. level—and taking out ore from the upper works.

BROOKLYN.—The winze from the 80-ft. level is now down 35 ft. The ledge is about 4 ft., with some good

ore through the vein. There is every indication of their near approach to a rich body of ore.

CHIEF OF THE HILL.—On the dump of this mine at the mouth of the tunnel we found about 25 tons of as hard-looking ore as we have ever seen in Ely District. It is of a higher grade than any previously found in this mine.

PIOCHE.—Working the usual number of hands, but taking out ore faster than at any previous time during the past 5 months. The Superintendent shipped yesterday by Wells, Fargo & Co.'s express, thirteen bars of bullion, valued at \$15,033.24. This bullion was about as fine an average lot as has ever been produced by any mine in Ely District. The assayer's certificate showing the most of it to reach over 900 fine. Superintendent Nelson says he will make a smaller shipment at an early day. The new shaft in this mine is progressing rapidly, the ground being of a favorable character. The work is being done by contract, at the rate of \$11 per foot—probably the cheapest piece of the kind ever performed in this district.

BOWEN.—On the strike in this mine holds out well, and bids fair to prove a rich and permanent development. They will commence shipping ore his week.

HAVANA.—Since our last report the mine has been worked energetically, and the ledge is looking as well if not better than at any other time. The incline on the ledge is now down about 190 ft. The ledge is at least 8 ft. between the walls, and the Co. are hoisting some very fine ore.

WASHINGTON AND ORCUTT.—The Co. are hoisting about ten tons of ore daily. Superintendent Tarpey showed us an assay made by Mr. Cahill, which he assured us was a fair sample of the ore now being raised from the mine—considerable care having been exercised in its selection. It was assayed at the rate of \$302.73 to the ton. About 20 tons a day are now being sent to the mill, a portion of which being ore extracted some time ago, from old works, reduces the average a little; but, notwithstanding, the ore is piling at the mill \$150. They are also raising on the ledge; the stopes showing an average of 2 1/2 ft. of ore. A winze has been sunk on the ledge recently, and a drift from the winze, run towards the east, now shows 3 ft. of ore, assaying equal to anything ever found in the mine.

HUMBOLDT.

DON GLEN.—Silver State, June 14: Dick Oranville and Tom Thomas are working on a gold ledge. Last week they saved about 50 pounds of the richest specimens, which they worked in a hand mortar. It yielded a little over 2 pounds of bullion, worth \$400.

A New COPPER DISTRICT.—Antoine Kaufman arrived in town last Tuesday with specimens of copper ore from the Table Mountain Range. Immense masses of copper ore were discovered about 20 miles from Bolivia District, in the same range in which that district is situated, organized a new district, to which they have given the name "I. X. L.," and located several claims.

RELIEF DISTRICT.—The Batavia and Pacific Co.'s mill is running steadily day and night on ore from the Central Pacific mine. The quality of the ore extracted during the past month has not been as good as that worked last winter. Within the last week, however, a decided improvement is apparent. A shaft is being sunk on the ledge, and at the present depth, 225 ft. from the surface, the ledge is 10 ft. wide principally white quartz with occasional spots of rich sulphure ore. The Central Pacific is encased in limestone, and it is well defined. The ore near the surface is rich, some of it working as high as \$1,300 per ton.

GOOSEBERRY.—Steve Torrell and Pete Keenan struck a rich vein of quartz in Relief District, one day last week, to which they have given the above name. The ledge is about 3 ft. wide, and samples of the ore tested by David Van Lennep, assayed \$300 per ton.

GEM.—A body of fine ore was struck in the lower level of this mine in Sierra District a few days ago. The ore is exceedingly rich, and remarkably free from base metals.

HENNING.—Some very rich specimens of black sulphure ore, from this mine, may be seen at David Van Lennep's assay office. This character of ore was struck the present week, and is richer than any heretofore found in this mine.

INSPIR.—Four tons of ore from this mine, and shipped by Harris & Phillips to the Humboldt Reduction Works, last week, yielded \$239 per ton.

BUTTE.—A few days since a horse used at the hoisting works at this mine, while being led by a Chinaman, fell in an incline shaft and broke his neck. For sanitary reasons a committee of the city officers have been concluded to bury the carcass. In digging a hole for that purpose, a rich ledge was discovered.

ARIZONA.—Seven tons of ore from this mine, worked last week by Olintz & Gineacs, at the Humboldt Reduction Works, yielded \$601.61 per ton.

WASHOE.

BELCHER.—Old Hill News, June 14: Daily yield over 600 tons. The main south drift at the 1300-ft. level has its face still in good ore. The cross-cut east show no change from last week, and the main incline is within a few ft. of the 1300-ft. station, with the bottom in hard blasting rock. The south portion of the 1300-ft. level is looking even better than at our last report, showing that the great ore body holds out and extends well to the southward.

JUSTICE.—Daily yield about 20 tons, from the old south mine. The 270-ft. level, at this point, gives a very good showing of ore, and the main incline shows 6 ft. of very good ore. At the 400-ft. level from the old Justice shaft, the main drift is in 600 ft., and the cross-cut east from the old Justice chimney is in 16 ft., the face being close to the vein.

SUBMERGED ROCK ISLAND.—The work of cleaning out the old tunnel is making very good progress, it being now repaired and put in working condition a distance of about 360 ft.

DANBY.—New shaft 112 ft. deep. Not sinking deeper at present. The foundations for the new hoisting works building are laid, and the erection of the frame work commences to-day. The boilers are being set, the engines and other machinery being put in position.

JULIA.—Good progress still made sinking the shaft, notwithstanding the hardness of the rock. The south drift is being pushed ahead and ought soon to cut through into the ore body. The water increases somewhat.

HALE & NORCROSS.—Daily yield 80 tons. The winze below the 1700-ft. level is down 50 ft. and a cross-cut is being made in it to determine the size of the ore body it is in. The ore is of medium quality. The north drift at the 1700-ft. level has reached the southern boundary.

BALTIMORE.—The drift is resumed at the upper or 225-ft. level, drifting both north and south. At the lower, or 445-ft. level, the drift west is being pushed steadily toward the expected ore deposit, making good progress, a id with very encouraging indications.

GOULD & CURRY.—The extensive body of ore mentioned in last report as being developed at the second level is of too low grade for working. Prospecting goes on as usual at the lowest level, and the connection is nearly made with the Savage mine at the south drift at the 1500-ft. level.

ARIZONA & UTAH.—The ore developed in the ledge by the east drift east is considered a very important strike, although not promising largely at present.

CROWN POINT.—Owing to breakage of machinery and arrangements for a distance of about 300 feet, the work making very good progress. A ledge about 160 ft. wide is exposed, composed of good, lively quartz, black dyke, seams of talcose clay, with plenty of sulphurates and occasional spots of ore. Being only about 60 ft. below

the surface, such indications are highly favorable to the finding of an extensive body of good paying ore at a greater depth.

IMPERIAL.—All preparations being at length completed, the extraction of ore from this mine commenced on Wednesday, and it is now coming out at the rate of 30 tons a day from the lower level. It assays well, and will probably pay well under the stamps.

MIST.—The main tunnel of the upper workings is now in 92 ft., still following the ledge. A cross-cut is to be made next week into the ledge, which constantly improves in appearance as farther developed.

JACON LITTLE.—Very good headway is made in the lower level, and the ore is rich. It assays richly, some of it going as high as \$500 to the ton.

SAYATOR.—Drifting south at the lower level, but not cross-cutting east into the reputed rich ore deposits as yet. The connection with the 1600-ft. level for ventilation is nearly completed.

CHOLLAR-POTOSI.—Daily yield 160 tons, from the old ore station. The main drift north at the 800-ft. level is being actively driven ahead, to connect with the Hale & Norcross.

SIERRA NEVADA.—The mine shows considerable improvement especially to the northward, where a very good streak 10 ft. wide is developed. Mill running steadily.

VALLEY.—Total depth of the shaft, 344 ft. The appearances at the bottom indicate that the vein is close at hand, the ground being a mixture of clay and quartz.

CALEDONIA.—Considerable water is encountered in the main drift, second station; no other change to note. Still extracting and shipping ore to mill.

OVERMAN.—The main drift west, and both its right and left branches are going ahead finely in granite, with occasional streaks of quartz.

OPHIR.—Some very good ore streaks of quartz are found at the 1300-ft. level in cross-cutting, which give low assays and promise better.

WOODVILLE.—Both mills kept steadily running on ore from the mine. Everything working well, and plenty of ore in sight.

VALLEY JACKET.—Nothing new to report. Drifting north and south in the vein, at the 1400 and 1500-ft. levels as usual.

SILVER HILL.—Daily yield about 60 tons. The mine continues to look finely in all parts, with nothing new to report.

Idaho.

MAHOGANY.—Owyhee Advertiser, June 14: Preparations are being made to sink a winze for the 8th level, 220 ft. south of the main shaft. A new and exceedingly rich body of ore has recently been struck in the 7th level drift, 264 ft. south of the shaft. The vein is from 2 1/2 to 3 ft. wide, and this week an assay of ore (noted in reference to its special richness), yielded \$406 in gold and \$806 in silver per ton, or a total of \$1172 per ton. There is plenty of the same quality in sight. The ore is a black sulphure, interlined with pure native silver and fine gold in abundance. The stamps of the Ellmore mill commenced running on Mahogany ore last Tuesday, and they had over 500 tons ready for hauling and crushing.

MISSEWA.—The main shaft is down on the 6th level which takes it to a depth of 536 ft. The 6th level is being run both north and south, having cut a very rich 2-ft. vein in the latter direction. A winze from the 5th to the 6th level, 26 ft. north of the shaft, is down all the way on the vein, which is from 3 to 4 ft. thick. The 4th level drift is in 208 ft. south and 370 ft. north, also showing very rich ore, a depth of 3 ft. in width.

GOLDEN CHARLOT.—It now transpires that a rich and extensive body of ore has been developed in the 6th level of this mine, commencing at the winze, 200 ft. south of the main shaft and continuing farther south for a distance of 150 ft. The ledge varies in width from 15 inches to 2 1/2 ft., and shows pure gold and silver in abundance—decidedly richer than that which the mine yielded in the palm days of '83. The ledge is well defined and immensely rich throughout, it being estimated that considerable of the ore will pay from \$500 to \$2,000 per ton. The daily yield is now about 12 tons, which will be largely increased as soon as the level shall be properly opened. The main shaft is down to the 9th level, a depth of 580 ft. A 70-ft. winze from the 5th to the 7th level commenced on the 10th of drift 200 ft. south of the shaft. An 80-ft. winze, 200 ft. south of the shaft has also been completed from the 7th to the 8th level. The 8th-level drift south is now in 210 ft. Both the 7th and 8th levels are yielding good milling ore.

RED JACKET.—The north level is now in 600 ft., being within 250 ft. of the drift shaft where a very rich chute of ore is known to exist. The incline winze is down 90 ft., and the west cross-cut from the lower level is in 90 ft. in

Mine Development.

The general dissatisfaction existing among stockholders in regard to the management of some of our mining corporations has made more popular the plan of developing mines by selling undivided interests to a few responsible men, and then opening and working them at the expense of each in proportion to his interest. This is substituting the simple copartnership for the incorporation plan. Under this method mines that would pay no profit to, and might be a tax upon, several hundred shareholders, owing to the outlay to meet the salaries of a score or more of corporation officers, would speedily bring fortunes to their limited number of owners. It is reasonably believed that there is not a developed mine in Ely district which would not, if owned by a limited number of working partners—by which we mean practical miners, who would develop their property in an economical and miner-like manner—pay handsome profits. But under the incorporation policy, how few are dividend-paying? Not one in twenty brings legitimate profits to its shareholders. How could a mine of ordinary richness, be expected to be profitable, when a score of ornamental appendages are luxuriously supported by its development proceeds? We can name a dozen of mines which would be purchased by capitalists at all their certificates of stock call for, if there were any way by which purchases could be consummated; yet they not only do not, as now managed pay dividends, but have leveled themselves after assement. Attempts to buy the property always fail, as the first movement in that direction throws the stock up above what the proposed purchaser would be willing to pay, and the Trustees usually have "too good a thing on their salaries" to entertain propositions looking to disincorporation. And yet, we are forced to acknowledge that our silver districts would long lie undeveloped were it not for the incorporation system. It requires vast capital to open up and prove by practical results the wealth and argentiferous veins; individuals are seldom found who are willing to take such risks; and we must, of necessity, look to the incorporation system for the first development of newly discovered mines. But this necessity ceases to exist in regard to new mines in old camps. Assay offices, mills, and mining supplies of all kinds, are now here in abundance. The mine-owner has only to bring paying ores to the surface to realize profits from his mine. More custom mills, managed in an honest and economical way, with owners who would be satisfied with fair returns on their investment, is the present great requirement in this mining district. The history of quartz mining in California and along the Comstock exemplifies the correctness of these views. The attention of capitalists is invited to this promising field for the erection of custom mills. Cheap and efficient reduction of ores would bring into availability scores of ledges now lying undeveloped.

HOW TO MEASURE THE INCLINATION OF A SLOPE BY THE EYE.—Powell in his "Colorado expedition" says: And here I made a discovery that has been interesting and useful to me since. On looking at a mountain directly in front, the inclination of the slope to the horizon is greatly exaggerated, and the distance to its summit and its true altitude is correspondingly diminished. To judge of the slope of a mountain side you must see it in profile. Now, in coming down to this point during the afternoon, I had noticed the slope of a particular part of the cliff, and had made an estimate of its altitude. While at supper I had noticed the same cliff from a position facing it, and it seemed vertical, but not half so high. By lying on my side and looking at the same, its true proportions appeared. This seemed a wonder, and I got up to take a view of it standing erect. It was the same cliff as at supper time. Lying down again, it was the cliff as seen in profile in proportion to the advantage of seeing the features of its full face. And musing on this I forgot the morrow and the cañons to come. I had found a way to judge of altitude and slope as I could judge of distance and trend along the horizontal. The reason, too, is simple; a reference to the stereoscope will suggest it at once. Since then I have often laid down on my side to search the cañon far away to its summit.

IMPORTANT TO MINERS.—Mr. A. J. Doolittle, of Liberty Hill, Nevada county, is having built in this city for himself, Wm. Hara and Henry Raymond, a newly invented machine for hydraulic mining. It is of an entirely new pattern, based, Mr. Doolittle says, on scientific principles, and gives a greater area of discharge than is usual. There are no bolts or nipples to interrupt the flow. Mr. Doolittle claims that his machine will accomplish the purpose for which it is made without the loss of power incident to the machine now in use. It will work at a sufficiently low angle to enable miners to wash out the "blue cement" without the necessity of blasting. It will turn 25 degrees below horizontal at short range and give an unbroken effect. We have seen the machine, now nearly completed, but cannot at present enter into details of construction or operation.

Dubois' Mower Attachment.

The accompanying cut represents Dubois' Mower Attachment. This is the device for lodged grain or grass—the one used for standing grain or grass being much smaller. This for lodged grain or grass consists of a small cast iron shoe fitted to the under side of the cutter bar, and in most respects like any other shoe, with the exception that it is just on a level with the top of the cutter bar. This pattern has to be slightly varied to suit the different kind of machine upon which it is placed.

The balance is alike on all machines, and consists of a $\frac{3}{8}$ -inch bar of iron bolted upon the under shoe at the point and also at the end of the cutter bar.

This iron projects forward three feet and a half; then is turned back and rises at an angle of about fifty degrees, and turns toward the body of the machine. A knife is placed upon this point near the ground, and rises with the same angle, and is about two feet long. The bar of iron first mentioned also projects behind the cutter bar two feet or more, curving all the way toward the body of the machine, and then runs directly to the cutter bar, where it is fastened by a bolt. The whole is housed with light galvanized iron.

The effect is this: The knife in front cuts through all obstructions in the line of the shoe, the curved iron in front turns it toward the body of the machine, and the hinder part completes the separation. The wire is attached to the curved iron in front, and attached to a

We are pleased to notice this highly favorable opinion of a practical working test of one of our California inventions. Mr. D.'s patent was obtained through this office, and we hope he will reap a rich reward from his ingenuity and enterprise.

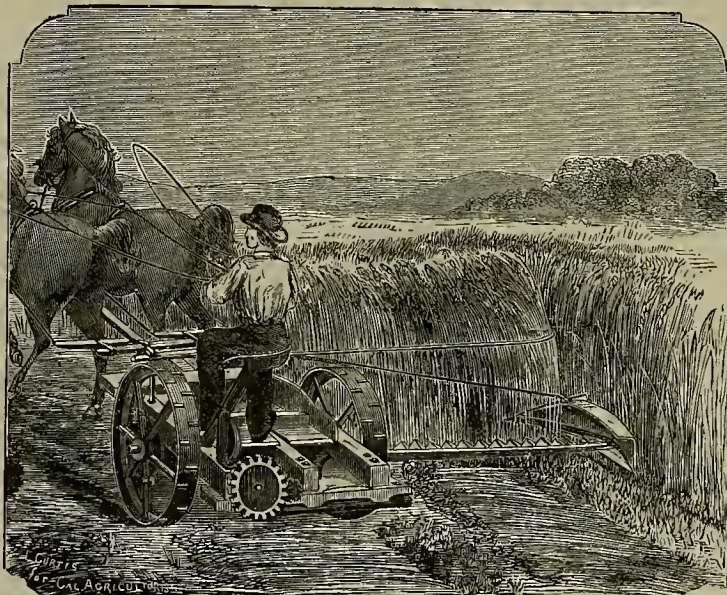
A further trial will soon be made at Fruit Vale, Oakland, under the auspices of the Farmers' Club, timely notice of which will be given through the Press.

MINES IN GUATEMALA.—In a letter to the *Alta* from Guatemala a correspondent has the following item in relation to the mines:—We are told of quicksilver, two days' journey from this place, through a chaparral jungle, where the metal flows, a dripping stream thick as a goose-quill—a mine of argentiferous galena and one of zinc, near Point Isabel, on the Atlantic side. We have not found a reliable guide to the former, and the road to the other is barred at present by the revolutionists.

But it is plainly to be seen that there is a vast and varied wilderness of mineral wealth quite unexplored—gold, silver, zinc, copper and lead—all free to adventurers, and under a Government generous in concessions, and apparently making no invidious distinctions. It appears to us that native labor tends entirely to agriculture, and mining force must come from abroad. No objections will be made to Asiatics, Africans or Indians. White can scarcely be made a standard, where shading off prevails almost to the other extremity.

Land and mineral veins can be had by simple denouncement, which means recorded notice of preemption. This entitles you to an order of survey. When this is returned, a sale is made to the highest bidder—always cheap enough.

COAL.—The *Contra Costa Gazette* says coal mining is very brisk at our Somerville and Nortonville mines, which are being worked



DUBOIS' MOWER ATTACHMENT.

standards on the body of the machine with a spiral spring wire. This is sometimes used and sometimes not, according to the character of the mowing. For standing grain or grass we use the wooden sweep, mounted on standards on the body of the machine, and the smaller device above mentioned.

The effect in standing grain or grass is that the heads of the grain or grass are turned toward the body of the machine before it is cut, and when cut drop nearly straight with the cutter bar, and that part behind the cutter bar moves it away from the standing grain or grass. When the mower has passed the beneath will be found to lie even and straight as if cut with a grain cradle, with the butts all toward the standing grain, and separated from it about one foot. From the many flattering notices that we have seen from the press, as well as from what we have seen, we regard it as a most valuable invention, and will no doubt do away entirely with all those devices heretofore used for the same purpose, and which have proved so entirely inadequate to the purpose for which they were intended.

The California *Agriculturist* for Sept., 1872, says of Dubois' Attachment to Mowers, that we have examined the working of these devices, both in standing and in lodged grain, no other grass being in season to cut on Mr. Dubois' farm at this time. In tall grain the sweep attachment laid the cut grain with the heads away from the standing grain against a strong wind, saving the labor of forking it away. We regard this invention as a very valuable one. It is just the thing desired.

The other device is a knife and mould-board attachment to be used in lodged grain or grass. It worked admirably, separating the swath from the uncut grain as nicely as the best swarther can do in good standing grain or grass. We only wonder somebody had not thought of it before. Both inventions are simple but excellent, and seem to perfectly supply a want long and seriously felt.

with day and night-shifts of hands. The recent purchase of the Eureka and Independent ground at Somerville, by the Pittsburg Company, gives it not only a vastly-increased deposit of coal to work, but warrants outlay for working it to greater advantage than would be possible otherwise, and insures steadiness and permanence of operation at that place. The new shaft of the Black Diamond Company is steadily going down, and has already reached a depth of 350 feet. The new hoisting works, engine, and other adjuncts of the shaft, will be of the most substantial and effective character for the permanent and advantageous working of the mine. With the increase of working force the village of Nortonville, extending down the ravine, has nearly doubled the number of its dwellings within the past year, and every week from two to five or six new ones are put in course of construction.

DISCOVERY OF COPPER IN THE HUMBOLDT RANGE.—The *Unionville Silver State* says: Henry Jenkins and John and Charles Twice have discovered what they have substantial reasons for believing a good copper mine, in Tehama Cañon, Star District. They have located the ledge, which they have named the Independence, under the United States mining law, and are now engaged in prospecting it. At a depth of twelve feet from the surface they have a well defined vein, which carries from two to six inches of high grade copper ore, a few specimens of which, brought to town by Mr. Jenkins, can be seen at the Exchange Hotel. This is the first copper ore ever discovered in the Humboldt Range, and if the vein from which it was taken proves to be a mine of that mineral, its proximity to the railroad will add much to its value. Specimens of the ore assayed 65 per cent. copper, and strange to say, coming as it does from the immediate vicinity of rich silver mines, not a trace of silver. The owners entertain great hopes from the appearance of the vein that it will prove to be a permanent and very valuable copper mine.

Some American Benefactors.

Do not Americans appreciate education? Here is a list of some of their benefactions: \$1,300,000 by Mr. Simmons of Boston, for the industrial education of women; \$1,000,000 by Daniel Drew, to endow a Theological Seminary, to which Abel Menand adds \$100,000 more "for the education of women for the ministry," \$200,000 by Erasmus Corning, for a female College; \$400,000 by Robt. Barne of Indiana, for the education of orphans in that State; \$100,000 by Orange Judd, the agricultural book publisher, for Scientific Department in Wesleyan University; \$60,000 by Cyrus McCormick, the reaper, for Theological Seminary at Chicago; \$100,000 by Daniel Appleton, the book publisher, for chancellorship and library in New York University; \$100,000 by Nathaniel Thayer of Boston, to Harvard University; \$100,000 by Chauncey Rose of Terre Haute, Ind., for Female College; \$100,000 by Henry Sage of Brooklyn, New York, for female college building at Cornell University; \$500,000 by Mr. Shaw of St. Louis, for park and botanic garden; \$200,000 by Mr. Pardee of Pennsylvania, for Scientific Department of Lafayette College, at Easton Penn.; \$75,000 by Horace Sibley of Rochester, New York, for a library building at Rochester University; \$50,000 by the Rev. Jesse T. Peck to the new University at Syracuse, New York, which has been increased by other citizens to a million and a half; \$1,250,000 by Samuel Williston for educational purposes in Easthampton Mass.; \$250,000 by Captain Richardson of San Francisco, Cal., to found the Richardson College in Chicago University; \$50,000 by Edward Tompkins to found a chair of oriental languages in the University of California; \$20,000 by Mr. Raymond of Oakland, to the college at Toledo, Ohio; \$75,000 by Dr. H. H. Toland to endow a Medical Department in the University at California; \$100,000 in property and \$50,000 in cash, by John Anderson, of New York, to found the Penikese School of Natural History.

EXPLORATIONS OF THE ROCKY MOUNTAINS.—Four distinct scientific expeditions are now engaged in the exploration of the territory lying between the northern borders of Wyoming and the Southern line of New Mexico. One of these expeditions is headed by Prof. Hayden and conducts its explorations under the direction of the Interior Department. An expedition, fitted out by the War Department, and detailed to survey and explore those portions of Colorado, Utah, Arizona, and New Mexico, lying along the line of the 100th meridian, is under the charge of Lieut. George M. Wheeler. The engineers of Gen. Ord's staff are engaged in exploring northwestern Wyoming, while those of Gen. Pope's staff are at work surveying that section known as the San Juan country. To this list another scientific party from Yale College, in charge of Prof. Marsh, the eminent Paleontologist, is about to be added, being now on its way to join the Wheeler party, with which it will cooperate. The most important results may be expected from the labors of these expeditions, as the topography, geography, geology, and general resources of the territory to be explored will be carefully examined and noted.

SCHOOL OF NATURAL SCIENCE.—John Anderson, who gave Pembroke Island, his completely furnished residence, and \$50,000 to Professor Agassiz, to found a school of natural science, suggests that, to make the endowment ample and the institution a national one, that State Legislatures contribute \$25,000 each to the fund. If the States cannot constitutionally do this, the friends of the school hope that the wealthy men of the several States will emulate the generosity of Mr. Anderson, and endow the school with sufficient means to make it preëminent among scientific institutions.

MINING SWINDLER.—The *Pioche Record*, of a recent date, speaking of mining swindlers, makes the following sensible remark: "When we give the world to understand that the mining communities themselves view such swindlers as heinous crimes we shall have much less difficulty in inducing the investment of capital in the mountains in honest enterprise."

THE NEW OBSERVATORY to be erected on the west side of the Weber, at Ogden, will require twenty men to take care of it. It will be the headquarters of the Topographical Corps of Utah, Arizona and Idaho.

MINERS are in demand, according to the *Boise City Statesman*, both in the Basin and at Rocky Bar, while those who are handy with the ax can get plenty of wood to cut at \$2 per cord.

MINERS are leaving Pioche for the Cherry Creek mine and to northern Arizona in search of cinnabar, rich deposits of which are said to exist in that region.

SPARTA, a mining camp in Union county, Oregon, was disappointed in its water supply this season, as it went away without doing them much good.

WET MOUNTAIN VALLEY is excited on account of the discovery of what appears to be the richest gold mine in Colorado.

THE HALE & NORRIS mine receipts for May amounted to \$45,581.

USEFUL INFORMATION.

SPECTACLES.—Spectacles are worn by so many people now-a-days, that we are often inclined to wonder how former generations managed to get on without them before they were invented. The old Greeks and Romans do not seem to have known the luxury; but then, perhaps, their eyes were better than those of the present short-sighted race of mortals. One thing, they had not so many newspapers to trouble them as we have.

But spectacles, after all, are not such a recent invention as might, perhaps, be thought. They did not come into use in Europe until about the year 1300, but they are of unfathomable antiquity in China—not indeed, of glass, but of rock crystal. We affect to despise the humble efforts of the untutored Esquimaux, but even they have had a sort of spectacles of their own, long before they ever had an opportunity of seeing any from other lands. They are ignorant of the manufacture of glass, or even of pottery, and they, therefore cannot construct a lens; but they have constructed an instrument of wood and bone—an eye shade—which is not only a protection to the visual organs, but assists the visual power of the eyes. The Esquimaux term it *itlee yaya*—far sight—the very synonym of our word telescope.—*Once a Week.*

THE POWER OF COAL.—The Secretary of the West Yorkshire Association of Miners is rather eloquent on behalf of his clients when he says thus:—"A man who is a good, strong, practical miner in some of our thick seams will, by an extra effort, produce five tons of coal in a day, and what will these five tons do? In the first place they will realize for himself 62 cents per ton for getting them; secondly, they will bring to his master nearly \$12.50 in profits. Then if we take them to the factory door, they will turn the engine, and find one day's employment for over 2,000 factory operatives, whose average wages at 75 cents each, amounting in the aggregate to about \$1,500, will be distributed into every channel of trade, besides realizing to the owners of the factory \$1,000 more in profits. Then probably they may be the means of producing from 6,000 to 7,000 yards of calico or other fabric which may be used to the warmth and comfort of 2,000 people, and this may be done from the work of one miner by one day's hard work." What will he say of such a coal proprietor as Earl Dudley, who gives employment to 8,000 or 10,000 of such valuable miners?

CHARACTERS AS WELL AS FEATURES TRANSMITTED.—In Galton's recent work treating of hereditary influence, he holds that there are certain marked types of character justly associated with marked types of feature and temperament. That the latter are inherited, no one questions, and the same may therefore be inferred of the former. As examples, Galton instances the face of the combatant, which is square, coarse and heavily jawed, differing so strikingly from that of the ascetic, the voluptuary, the dreamer and the charlatan. But still more strongly marked than these are the typical features and characters of different races of men. The Mongolians, Jews, negroes, gypsies and American Indians, severally propagate their kind; and each kind differs in character and intellect as well as in color and shape forming a class of instances worthy of close investigation, in which peculiarities of character are invariably transmitted from the parent to the offspring.

NUTRITIVE VALUE OF BLACK TEA.—Tea is not only to be considered as a stimulant, but also as nourishment. That people who use tea are able to live longer and do more work on an insufficient amount of food, than those who abstain from the beverage, is attributed to its power of preventing the waste of the body, and in the animal economy may be compared to the financial proposition that a "penny saved is twice earned."

From the large amount of nitrogen it contains, it may also be considered, to a certain extent, a direct means of nourishment. A. Vogel has thought it worth his while to determine how much of his nitrogen is employed in the infusion. The tea examined gave 6.6 per cent. ash, and 25.5 of extract, which was found to contain 2.8 per cent. nitrogen, while the partially exhausted leaves contain 3.58 per cent. From this it would seem that, unless we contrive to devote the whole leaf, we lose the largest portion of the nitrogen.

FOAMING IN BOILERS.—The *Scientific American* in reply to the queries of a correspondent, "What causes foaming in an engine boiler? Is it dangerous or apt to cause an explosion of boiler? Does steam ever descend under the water in a boiler and force the water up and then take its place?" answers as follows: "Foaming is caused by the generation of steam more rapidly than it can discharge itself from the mass of water within which it is formed. It may give rise to inconvenience, and even danger, either by carrying water out of the boiler more rapidly than the feed pump can replace it, or by entering the steam cylinder of the engine and creating a liability to accident, when the piston strikes upon it, at the end of its stroke, by breaking crank pin, connecting rod or cylinder head. Steam does not get under the water, but is sometimes so rapidly discharged, at points on the heating surface under water, as to almost or quite displace the water.

A CHEAP AND EXCELLENT FLY-TRAP.—Now that the hot weather approaches, the following method of trapping flies, as practiced and indorsed by a correspondent of an Irish agricultural paper, will be found useful: A common glass cover, or bell-glass, is the instrument to be used; this has to be tightly covered at the bottom with thick white paper. A circular hole, $6\frac{1}{4}$ inches in diameter, is then cut in the center of the paper, and the glass is placed on three bricks over a plate filled with beer, sugar and a little rum, a moderate distance from the infested spot. The effect is magical; in a few hours the glass is crammed with flies, which having tasted the sweet, fly upward to the light. A common sulphur match, made by dipping brown paper into brimstone, will destroy thousands. The constant hum of insect life will attract all to the glass, and the scent of the rum is sure to induce the most fastidious wasp to enter, as no insect can resist its powerful attraction.

VITALITY IN WOOD.—Vitality will sometimes remain in a bit of wood an incredibly long time. Not long ago a Boston lady, having occasion to use a support for an ivy plant which she was raising in a pot, took an old grape-vine cane and thrust it into the earth. Some time afterward, wishing to remove the ivy, she pulled up the old cane and found to her astonishment that it had sent out shoots and was making vigorous efforts to root itself by the side of the ivy. This bit of grapevine had been used for a long time as a cane, and for years which no one in the family could number, had been laying about the house.

RAPIDLY INCREASING CONSUMPTION OF HORSE MEAT IN PARIS.—There are now forty shops or stalls in Paris devoted to the sale of horse meat as an article of food. During 1872, 9,725 horses, 866 asses, and 51 mules were consumed by the inhabitants. *Les Mondes* says that the animals are prepared for the market in the ordinary way, and that the meat sells for about half the price of beef. The horses are inspected at the slaughter house with the greatest care. It may be noted as an interesting fact that hippophagy is decidedly on the increase, as 2,408,076 pounds of equine meat were eaten in 1872 as against 1,113,024 in 1869.

GOOD HEALTH.

Is it Safe to Drink Hard Water.

There is a popular prejudice that hard water is dangerous to the health, and on that account we are constantly warned by physicians to beware of it, but in England one of the leading authorities on this subject, Dr. Letheby, after devoting many years to an investigation into the properties of the water introduced into English cities, and to a study of the sanitary reports on the subject, comes to the conclusion that moderately hard water is safer and more healthier than soft water. Hard water is not only clearer, colder, more free from air, and consequently more agreeable to the eye and to the taste than soft water, but is likely to absorb organic substances, to sustain the life of zymotic organisms, or to exert solvent properties upon salts of iron or upon leaden conducting pipes. The lime salts exert a beneficial influence upon the animal economy, and even protect the system from dangerous outward influences. Dr. Wilson, of Edinburgh, has also collected much valuable material on the subject, and comes to the same conclusions as Dr. Letheby. He takes the ground that the human body requires for its nourishment and support a supply of certain mineral salts, among which carbonate and phosphate of lime play an important part in building up the compactness of the bones and in other functions. We usually obtain phosphate of lime in our animal and vegetable food, but not from the water we drink. Carbonate of lime, however, is not contained in adequate quantity in our solid food, but generally obtains in spring and well water.

It has been incontestably shown that in mountainous districts, where the water is more or less hard, the inhabitants exhibit the best physical development. On the other hand it is believed that in large cities the mortality is inversely as the hardness of water supplied to the inhabitant. A water which contains about six grains of carbonate of lime to the gallon is suitable for use in all household purposes. As a drink and for cooking food, such a water offers the necessary carbonate of lime for the support of life in the simplest, most natural and most digested form, and at the same time more agreeable, fresh and sparkling. It is evident that our preconceived popular notions on the subject of hard water need revising, and that it may be better to use such water than to have recourse to rain or ice water.

CARBOLIC ACID IN SCARLET FEVER.—Rubbing the body with hog's fat has the effect of reducing the temperature of the skin, in scarlet fever. Fr. Betz, of Heilbronn, directs to incorporate one or two grammes of carbolie acid into 100 grammes of lard, and, with this, to rub the whole body, excepting the head, two or three times a day, according to the intensity of the inflammation. It produces a pleasant feeling of coolness, and keeps the skin softer, and, after each application, the temperature of the skin falls somewhat. The carbolie acid has the effect of killing the germs and spores of the disease.

Worms in the Blood.

The use of the microscope has resulted in a great many important discoveries. One of the more recent and startling facts which have been brought to light, has been the result of an investigation by Mr. T. R. Lewis, Assistant Surgeon of the British Army in India, an account of which is given in the *London Lancet*. Mr. Lewis having been assigned to special duty under the Sanitary Commission for the Government of India, in examining the urine and blood of certain patients, discovered the existence therein of living, active worms, hitherto unobserved. These worms are one seventy-fifths of an inch in length, and have a transverse diameter of one three-thousandths of an inch. They are so numerous as to be found in blood drawn from any part of the body, and so persistent that they may exist in the system for months or years, without any marked evil consequences being observed. It is said, however, that they may give rise to serious diseases, and ultimately cause death.

The name *Filaria Sanguinis Hominis* has been given to them. It is described as moving about incessantly, coiling and uncoiling itself, and rushing about among the blood corpuscles, in all directions. These worms appear, through the microscope, like incompletely developed snakes. They continue active from six to thirty hours. From certain characteristics, it appears that they do not exist anywhere but in the blood and urine. Patients in whom these worms have been discovered are also observed to void what is known to physicians as chylous urine.

Dr. Lewis believes that the blood of persons who live in tropical countries is frequently invaded by these microscopic worms, which are not identified with any known species. The chylous condition of the urine is considered to be only one of the symptoms of the presence of the worms, although it is the most characteristic. It is believed that some of the hitherto inexplicable phenomena connected with tropical diseases will, ultimately, be traced to this condition of the blood.

Novel Treatment of Dyspepsia.

A very curious method of treating dyspepsia is announced as a complete success, by Dr. Brown Séquard. The most extraordinary thing is that the cure forbids the use of medicine, and relies not on articles of diet, but on the regulation of time in taking nourishment. Eat any meat and bread; be rather sparing of vegetables; drink wine and water—but you must not take more than two or three mouthfuls at a time. This homeopathic meal is to be repeated every fifteen minutes or so, not exceeding thirty minutes interval between these mouthfuls. Relief is soon felt; and in ten to twenty days' treatment you may begin gradually to increase the mouthfuls and the time spaces till finally you can take your former three meals in peace and digestive felicity. The rationale of this process is not given in the medical record we have seen. But it may be presumed that the disease is referred to the torpid production of gastric juice. A full meal finds no adequate response, and the food weighs heavily on the stomach and passes away to trouble the organism along the whole line of its extension. There is gastric juice for a few mouthfuls, and the patient soon finds the proper measure. Rest and relief from oppression give the stomach a show to recuperate; and Nature having fair play, effects the cure. Accepting this theory, Thackeray's condemnation of lunch and the orthodoxy of two meals a day may be questioned. For gourmands, the axiom may do "that lunch is base ingratitude to your breakfast, and a premeditated insult to your dinner." Stomachs that can digest leather, want no rigid rules. But not only does Dr. Brown Séquard's prescription sanction our usual three meals a day, but it rather prefers the usual fourth meal of England, viz.: supper at nine, and a Punda nightcap to woo repose.

TRANSPLANTING HAIR.—The successful transplanting of skin and flesh to assist the recovery of wounds, has induced some one to experiment on hair, and the result is a process of removing portions of the scalp, with the hair on, from some luxuriant head, and planting on the victim of baldness. A contemporary points out that it may soon become fashionable to wear hair of various hues and shades, thereby producing the most singular and beautiful effects of color; or the hair might be made to appear white, green, blue or red, at the owner's option, and by various ways of disposing it. "Take, in due proportions, hair of all the prismatic tints, rumple it, and immediately you have white hair; comb it in another way, and there is your purple, your ultramarine, your yellow, or any possible hue." If these directions are followed, the recognition of the original color of the head may require the use of the spectroscopic.

A foreign medical journal states that bullock's blood is now in great vogue in Paris as a remedy for anemia and phthisis. Persons of all ranks and ages and of both sexes, may be seen every morning thronging the shambles, to drink the foaming, reeking blood of oxen. Young ladies prefer it to cod liver oil, and swallow it with a gusto. For more fastidious patients an extract is prepared in the shape of pills. Of course many cures are reported.

COFFEE AND QUINIA.—M. Briquet considers the common practice of administering quinia, forming a tasteless and insoluble and almost inert salt—the tannate of quinia, from which the stomach has as much difficulty in extracting quinia as from powdered bark. It is, he thinks, one of the worst preparations of quinia.—*Brit. Med. Jour.*

QUININE is rapidly giving place to *Eucalyptus globulus* in the treatment of malarious fevers in the island of Mauritius. During the hot season these fevers are very prevalent there, and this substance given in the form of an infusion of the leaves, is said to be quite as effective in treating them as quinine, and far less expensive.

DOMESTIC ECONOMY.

How to Cook a Parsnip.

A badly cooked parsnip is neither eatable nor digestible, but cook it properly and it is a delicacy worthy of a place on an epicure's table. I shall show how to make the best of this nourishing root, and hope that many readers who have cared little for parsnips hitherto will, after a fair trial, appreciate them as they deserve. No matter what the size or shape of a parsnip, it is invariably good throughout, and very little, indeed, should be wasted in preparing it for the table. The best are those of medium size and even outline with few brown specks on the bark. They should come into the cook's hands quite clean, and to prepare them thus far it is generally necessary to scrub them with cold water. From the moment they are taken in hand for cooking until they are served on the table there should be no delay of any kind; for the more they lie about after being scraped, and especially if they soak the water, the more they lose flavor and tenderness, for the most precious qualities are soluble, and are soon soaked out, the fibre only being left. Cut out the crown without waste, remove the extreme tail and any small side roots, and then scrape off the bark and carefully cut the brown specks and streaks. It is better to scrape than pare them, for the outside is richly flavored and highly nutritious. It is scarcely possible to cook large parsnips whole, and, of course, there need be no directions given how to cut them. But it is very important to bear in mind that they should always be cooked whole if possible, and when they must be cut, the less cutting the better. The more they are cut, the more surely the goodness "flies away, flies away." Now, we want for the cooking a small quantity of boiling water seasoned slightly with salt, in an iron pot sufficiently large for the parsnips. Throw them in, shut them down, and put the pot on the fire. As soon as it boils draw it to the side, and there let it simmer for full three-quarters of an hour, and then try the parsnips with a fork. If quite tender, pour the water off, and shut them down, and keep them on the hob until they are wanted. They may stand an hour without harm, if close shut down, on a hot plate or hob with steam enough of their own to keep them from burning. If cooked slowly in scarcely water enough to cover them, they will be as soft as butter, and of the most delicious flavor. If cooked in a large quantity of water, and especially if put on in cold or even warm water, they will be comparatively worthless, for the goodness will be soaked out of them, as too often it is soaked out of potatoes and boiled joints of meat.—*Gardener's Magazine.*

Cooking Celery, Carrots and Salsify.

When there is a plentiful supply of celery on hand, it is not only desirable to eat it raw, but also cooked, and there is as much difference between cooked and raw celery, as between cooked and raw tomatoes. In cooking celery, the green stalks can be used as well as those fully blanched, and thus it is an economical process.

Cut the stalks into pieces an inch in length, and stew in a little salted water until quite tender; then turn away all the water, and pour over it a small cup of rich sweet milk; add to it a good big piece of butter, thoroughly rolled in flour, and boil it up for ten minutes.

This makes a very rich, creamy-tasting sauce, and the whole dish is appetizing and agreeable. Carrots cooked and served in this manner are also very much liked in our family; and those who have never tasted them will find the dish a pleasing addition to their table. We are all of us accustomed to their use in soups—but few eat them as a table vegetable.

Salsify or vegetable oyster, if cooked and served in the same manner, is also a delicious relish. It can be grated fine, after boiling, and then seasoned with butter, salt and pepper, and fried like codfish balls.—*Country Gent.*

"EGOS A LA SOLFERINO."—Boil some eggs hard, cut them in two, take out the yolks, and beat these up with a little parsley and salt, and replace into the whites, of which out previously the under part a little, so as to make them stand in the dish, and serve up with a nice sauce round them. Let them be quite hot when served.

MINING SCIENTIFIC PRESS

W. B. EWER, SENIOR EDITOR

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San Francisco:

Saturday Morning, June 21, 1873.

Legal Tender Rates.—S. F., Thurs., June 19, — buying 88½; selling 88½.

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• INTERESTING COLLECTION.—Mr. J. W. Glass, is exhibiting, at 1053 Broadway, Oakland, a large and interesting collection of mineral, botanical and fossiliferous specimens, and Indian relics and curiosities, which he has collected mostly in Arizona and New Mexico and upon the great Colorado desert. There are upwards of 2,000 botanical specimens, many of which are both new and interesting. All are well preserved and mounted. There are also some 8,000 mineral specimens and curiosities. The collection is offered for sale, entire, at a very small sum; with which, when realized, Mr. Glass will again take the field for further explorations. It would form a very fine museum for an academy or scientific association, or for a private gentleman. An opportunity is here presented for some person to immortalize his name, and encourage scientific exploration and investigation by making this collection a present to some public institution. The exhibition is free and well worth a visit.

THE FLAGSTAFF MINE, Little Cottonwood, Utah, is arranging to ship 100 tons of ore per day. The Emma mine is also increasing shipments.

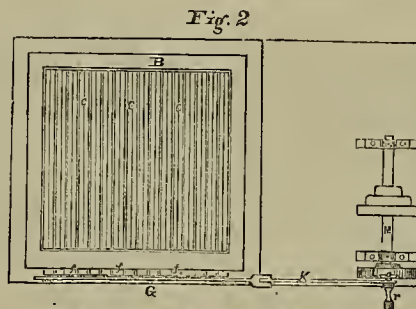
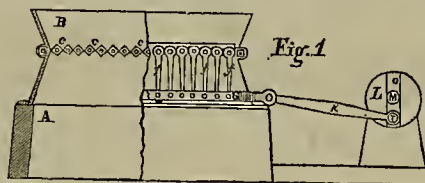
THE Burnt River Ditch in Eastern Oregon, has been leased for a term of three years by R. Pleasanton, of Rock Island, Illinois, for \$280,000.

A BLAST of 368 kegs of powder was exploded in the Blue Point claim, at Sucker Flat on the 17th inst.

MINING at Grand Ronde river, Oregon, is in a very prosperous condition.

Potash Salt.

The mines from which this product is obtained are very valuable, since there is no competition in the market. There are only two of these mines, one of which is in Germany, at Leopoldshall and Stassfurt, and the other in Austria at Kalusz. Mr. Knstel writes us from Vienna, that a very complete exhibition of everything connected with potash and its production, can now be seen at the Vienna Exposition. He says, in referring to the mines mentioned above, that it is the belief that these potash deposits are the result of the evaporation of former remainders of large seas that concentrated in a few favorable localities. The formation of these deposits under such peculiar and lucky circumstances, indicates that little prospect for new discoveries exist in this line, but it is not impossible that such deposits may be found in the United States, in districts where salt-rock is known to exist. Although the potash was known and used in many branches of industry long ago, its large and extensive application in practical life is not older than the discovery of the Stassfurt deposit (twelve or fifteen years ago). Formerly, the potash salt that covered the salt-rock bed was considered a nuisance; it was not utilized; its value not known; and now, not the immense bed of salt-rock, but the above nuisance is considered the wealth of Stassfurt. Eight millions of thalers were offered for that part of the deposit which is in Stassfurt, but the offer was not accepted. The total extraction of the salt in 1872, at Stassfurt and Leopoldshall was eleven millions of hundred weights. This shows what extensive use is made of this article in agriculture and trade. The potash is not free in the salt, but in several combinations. Beautiful specimens are exhibited of "Carnall-



STANDISH'S ORE FEEDER.

ite," consisting of chlorpotassium and chlor-magnesium. Then there are light, yellow specimens of "Carnallite"; it contains sulphate of potash, magnesia and chlor-magnesium. This will probably be the more valuable mineral for its sulphate of potash. Another, but less frequent mineral, is the "Sylvine" of pure chlorpotassium, and the "Boraxite," containing principally borate of magnesia, of which the produced large borax-crystals are also exhibited.

The existence of the potash in the salt-rock deposits of Kalusz was found in the year 1867; first in shape of sylvine, then appeared the carnallite, and lately also the carnallite in small quantities. Contrary to the appearance in Stassfurt, the more valuable mineral predominates in Kalusz. The sylvine is, as before mentioned, composed principally of pure chlorpotassium, which is extracted by simple leaching, and, of course, is obtained free of chlor-magnesium, which is difficult to accomplish at Stassfurt, even after several recrystallizations. In larger proportion than the sylvine, is found at Kalusz the carnallite, producing sulphate of potash and chlor-magnesium besides iron. This mineral, on account of its amount of sulphate of potash, is more valuable than either of sylvine or carnallite. The specimens exhibited (from Kalusz) are massive blocks of several dozen each. The carnallite runs in parallel, yellow-brown stripes. The carnallite is grayish-yellow. The sylvine appears in red and white varieties, mixed up with blue salt-rock.

CITY CREEK CANON.—A dispatch from Utah says: Much interest is felt in the discovery of a rich galena lead, in City Creek Cañon, seven miles from Salt Lake City and 500 feet from the new iron mine location. No mineral discoveries of moment have heretofore been found in these hills which bound the town on the north. This fact causes the unusual feeling that prevails over this location, and prospecting is lively; the proximity to the city is a material point.

Ore Feeder for Shaft Furnaces.

Among the patents connected with the mining industry, recently obtained through the agency connected with this office, is an ore-feeder for shaft furnaces, invented by E. V. Standish, of Belmont, Nev. The invention is an improved device for feeding pulverized ore and salt into upright or stack-furnaces. In this class of furnaces the ore is first finely pulverized and then dropped down through the furnace stack with a certain proportion of salt, so that in its passage through the heat and flames the ore is roasted and chloridized. This process of mixing and feeding the ore and salt into the top of the furnace requires to be accomplished regularly and thoroughly, and this invention is intended for this purpose.

Figure 1 of the accompanying cuts is a side elevation showing a section of one part of the device and figure 2 is a plan view. A represents the top or upper end of a stack-furnace. Upon this stack is constructed a shallow hopper, B, the opening through the bottom of which is almost if not quite as large as the upper end of the stack. The capacity and shape of this hopper can be varied to suit the different furnaces upon which it may be placed. The bottom of the hopper is constructed of a number of square metal bars, c c c, placed parallel with each other, and supported in place by means of journals at both ends which bear on the opposite sides of the bottom of the hopper. These bars may be made in a variety of shapes, but the inventor prefers the square or diamond shape. The bars are placed so that two opposite angles of each bar lie on a

Agricultural and Mining Lands.

A dispatch, dated Washington, June 13, says: Private inquiries having been made of the Attorney-General on the following subject, the question was referred by him to the General Land Office, and Acting Commissioner Curtis to-day makes this statement as a rule of the Department: On lands that have been entered or patented as agricultural lands, upon which valuable mines were known to exist at the date of such entry, parties owning such mines are in no way debarred from acquiring title thereto upon compliance with the laws and instructions regulating the disposal of mineral lands, as, by express provisions of the laws, no title can be acquired to mineral lands under the Acts regulating the disposal of agricultural lands. In all cases where lands have been returned as mineral upon the township plot, or where affidavits are filed with local land officers, alleging that the lands are more valuable for mining than for agricultural purposes, it is the duty of the Register and Recorder to cause a hearing to determine their true character, before allowing their entry under the pre-emption and homestead laws.

Academy of Sciences.

At the last regular semi-monthly meeting of the California Academy of Sciences, held on Monday evening, Messrs. Geo. W. Lewis, Agapius Houcharenko, Cutler McAllister, and John R. Jarboe were elected resident members and Wm. C. Ralston a life member.

The following additions to the cabinets were received: Specimen of gorgonia, obtained at Cerros Island; also skull of species of fish related to the Rays, both presented by Captain J. A. Wilson, of San Pedro; skull of the mountain sheep, *Ovis Montana*, with immense horns, presented by E. Waeserman; two curious specimens of crustacea, from San Francisco Bay, presented by Henry Chapman.

Judge S. C. Hastings read a paper on the cation of frost on vines, which will be communicated to the Wine Growers' Association.

Mr. A. W. Chace read a very interesting paper on Artesian Wells in Los Angeles County, which we will take an early opportunity of publishing with accompanying diagrams.

Copies of the Proceedings of the Academy for 1873 were distributed to the members. It is quite a creditable production for so short a time considering the few contributing members. It contains about 96 pages and completes the proceedings up to May. The pamphlet contains several plates and the subjects treated are all of Pacific Coast interest.

TREATING THE ORES OF MERCURY.—A correspondent calls attention to the letter of Mr. Kustel, in our last issue, on the Patara process for the treatment of the ores of mercury. He thinks Patara is making poor progress in his improvements in that direction, when viewed from a California standpoint. He very properly considers a loss of from 30 to 50 per cent., as set down for the Idria mines, as a most wasteful practice, and notwithstanding the great reduction in such loss effected by Patara—from 30 or 50 per cent. to 16—the average of loss still remains far greater by this improved method than the most wasteful process employed in this State.

The loss at Almaden is not above 5 or 6 per cent.; while the Coalt & Roach, and the Knox & Osborne and other processes claim to work within one per cent. of assay value; and where wood can be obtained at \$5 per cord, at a cost of only \$1.25 per ton for ordinarily selected rock, simply reduced to what may be called a large egg size; the great cost of crushing, stamping and concentrating is saved by the latter process. We have written to our Vienna correspondent for a full description of the Patara process, which will be placed before our readers as soon as received.

A CLEAN-UP (partial) of the Spring Valley Canal and Mining Company at Cherokee Flat, of a ninety-days' run, resulted in \$50,000 being taken up. Their new Canal is nearly finished, but the pipe across Feather river is somewhat delayed. One "chief" and a 5-inch nozzle only was used, nor was all the flume cleaned.

CHERRY CREEK mine, 75 miles from Eureka, which were discovered last September, turn out some very rich gold ore. Capital is wanted to erect reduction works; and no ore has as yet been worked.

IMPORTS of silver ore into Liverpool during May amounted to 1,520 tons and of silver lead ores 380 tons.

ANTIMONY is quoted in Liverpool at £60 to £61 for French Star.

We unintentionally omitted to credit a correspondent of the *Bulletin* for the article on Meadow Lake Mines, on page 394 of this issue.

The Comstock Mines.

Latest Home Views by our Virginia Correspondent.

NUMBER VII.

The results attending the rise and decline in stocks are manifold. Stocks forming the basis of all transactions in this enterprising portion of the world, rule with an unerring hand our individual destinies, controlling professional, mercantile and social affairs to a degree which is surprising when one stops to give the subject a moment's thought. When the

Stock Market is Lively,

Interested holders of idle stocks awake to the supposition that the mines which they represent can be made to assume a value in the eyes of the speculative portion of the community; old titles are looked up, and in the conflict of dispute to decide imaginary lines of long forgotten locations, the professional man is called into service and reaps a rich reward for his study of the mysteries of mining laws and croppings, dips, spurs, angles and variations of real or imaginary mines. Speculators are encouraged and flush, their prospects looking bright and promising, and realizing the success of their anticipations, the man of business feels the change in the increase of his sales. The social circle feels the change, and is happy, resources for amusement are invented, and as long as the delusion lasts everything runs smoothly. The expert can furnish positive information on all the workings of any mine, its prospects, developments and merits.

But When Stocks are Down

The world seems dead, business of all kinds is depressed, amusements die out for want of support, and in regard to the mines, although the leading ones are worked with the same pertinacity and vigor as before, but little attention is paid them, except by the far-seeing, close-monthed insider who knows its prospects and quietly prepares for the consequences, while the trifling adventurer stands powerless, asking anxiously of every passer-by "what is to become of us." For the last week we have experienced a season of depression.

Savage and Chollar.

Savage, making its rich development suddenly and unexpectedly, and the fact becoming surreptitiously known, the stock went up with gigantic strides, leaving the innocent and unsuspecting managers out in the cold, or, not looking for so valuable a change, or being short on it, caused them to prick up their ears and rustle in order to save themselves from total wreck. The strike in Savage, buoyed up by the recent previous showing of Consolidated Virginia, and followed by the strike in the Chollar, carried with a lively splurge the whole line of the Comstock, and awoke to life the somnolent wildcats, relics of last year, which for a short season have gloried in a prominence, for several months past unknown.

These recent developments being of great importance, it now becomes necessary, preparatory to the inauguration of a lively season, in view of the coming elections of Savage and Chollar, and for other reasons, to break these stocks, in order to reacquire their control for future manipulation, be weakening the public confidence temporarily in their value,—an operation hereafter in its conceptions, and to accomplish which, they whole market must suffer.

The mines above referred to, Savage and Chollar having been under the control of the managers of Crown Point and Belcher, now safely corralled for months to come, the stocks of the latter two, have, for the past few days, been hurled at the public at a ruinous sacrifice, and the object is being rapidly achieved.

The stock list is daily contracting, low priced stocks are sinking into obscurity or to a mere nominal figure, while those who are sacrificing stocks of known value, are at the same time quietly absorbing what indications promise to furnish a rich return for their seeming recklessness.

Another reason for this forced and unreasonable decline, between leading forces, in all lines of business, there is always a subject of dispute, or a personal animosity, which will injure itself to get even. The future of the

Hale and Norcross

Is not flattering. They have worked out their body of ore on the south to the Chollar line, and in the north have only a limited body on their 1600-ft. level on the Savage line, which amounts to but little and is doubtless the tail end of the Savage body.

The insiders of Hale & Norcross being aware of this, and knowing that a long season of assessments and hard work must elapse before its station, as a valuable mine, can be resumed, are gradually relinquishing their hold of the stock at as good an advantage as possible, which advantage the management of the Chollar are seemingly determined shall not be enhanced, at present, by what can be shown there. The Chollar have accordingly abandoned their crosscut west to the ledge, and are continuing their main drift north to intersect the opening on the Hale & Norcross south

line for air, and will probably do no more crosscutting until after July elections.

Cons. Virginia

Are running a drift N. E. from their main north drift towards their shaft, with which connection will be made in about two months, when the extensive body of ore which indications favor to exist in this mine will be explored, extracted and milled.

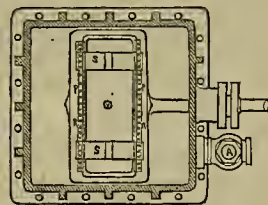
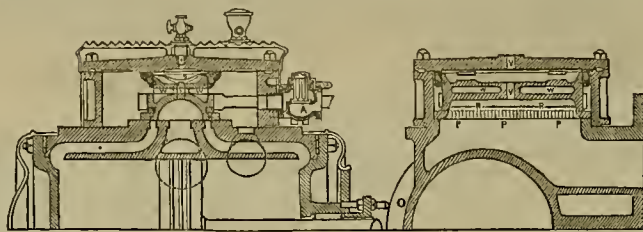
Ophir

Is pursuing the even tenor of its way; their encouraging developments during the past year being of sufficient importance to warrant their belief that they will soon be rewarded for the perseverance and expense which they have thus far incurred. They are sinking a permanent two-compartment shaft from their 1465-foot level, 400-feet east of their main shaft which will strike the west wall at from 400 to 500 feet depth. This shaft having become too deep for speedy sinking by windlass, a hoisting connection, by means of a series of pulleys has been made through the drift and shaft with one of their engines on the surface which works splendidly and will enable sinking to progress at the rate of four feet per day.

In the course of a month, a station will be opened at 1600-ft. from surface and the ledge cross-cut east and west. A good development in their mine, which it is hoped will be made soon, together with the recent developments in Savage and Consolidated Virginia would go far towards establishing the continuity of a series of rich ore-bodies along the entire Comstock ledge at about the level that the Sutro Tunnel will intersect it.

The Sierra Nevada

Some time since encountered a small streak of quartz in prospecting their upper workings, which, on being followed, has widened out to a body of good ore, now six to eight feet across, the extent of which is as yet unknown as it is



STEVEN'S BALANCE SLIDE VALVE.

still increasing in width and promises to be a valuable discovery for this company.

An Old Location,

Called the Sutro, on the north side of Cedar Hill, has lately been re-opened, and work on the same is progressing. As to merit, the result of future working will be reported, should the mine prove of sufficient importance to deserve public attention.

In Gold Hill

There is nothing new of stirring importance in the way of developments, except a steady and marked improvement in Crown Point.

The Imperial Company are hoisting about 1,000 tons of ore, which they have been sowing away in openings on and between the 1,600 and 1,700-ft. levels,—which would seem to indicate a preparation for more vigorous work, and probably to fully develop the body of ore which they are said to have struck in their south mine.

Crown Point—The Aulocral of the World

In Silver mines, improves with astonishing rapidity as prospecting continues. Their strike, two years ago, on the 1,000-ft. level, occurring in what was looked upon as a valueless mine, and about to be abandoned, was accidentally found by a prospecting drift, run at random, solely in the hope that the stock would advance a dollar a share,—old, original shares, then selling at \$3—in order that large holders might dispose of a portion of their stock at an advanced figure before closing their mine for good. This accidental discovery, unparalleled in its results, has grown to be the keystone of the Comstock, reviving the hopes and stimulating the belief that this great lode is inexhaustible.

The discovery was for a long time regarded with uncertainty, and especially by those most interested, but as prospecting advanced and its richness has been exposed, the extent and value of which is now as great a mystery as for the first six months of its development, the mining world stands agape with wonderment, and, speculating on the possibilities, work with redoubled energy, deep and wide in this fathomless vein, in the belief that similar bodies can and do exist.

This body, since its discovery, has been opened up to the 900-foot level, at which point

it seems to commence, and as deeper levels are opened a steady and rapid increase in its extent is shown going north—its limits advancing northerly at the rate of 50 to 60 feet for every 100 feet vertical in depth.

The Crown Point is comparatively a small claim, showing by actual measurement only 540 feet on the ledge; and should their body of ore increase on the north as it promises, a few more levels will show it to extend across the whole claim, and even across the Kentuck into the Yellow Jacket, on which ground it should make its appearance at about 1,900 feet deep. Reports have been current from time to time that the Crown Point ledge was "petering out," but a simple examination of the mine will dispel all such suppositions, for the most cynical cannot but find an increase in extent and value as depth is attained; the deepest point at which a pick can be struck into ore being the richest.

The only level in the mine which has been thoroughly worked is the 1200. On all other levels extensive bodies of ore remain for the future working. After working through their main body on the 1200 ft. level, a drift, 120 ft. north of Belcher line, was run east through a mass of barren quartz and porphyry, 36 ft., when an east body of ore was struck, 6 ft. wide at that point; this body has been sunk on by winze, and on the 5th floor above the 1300, another drift was run 53 ft. east from main body to connect with this winze for air. The east body at this point shows 27 ft. wide; milling \$65 per ton.

From the sill floor of 1300, a drift is run 66 feet through barren matter, cutting in the east 14 feet of rich ore, milling \$200 per ton, and is being continued through another streak of barren quartz toward the east wall, in the belief, according to indications above, that the main east body is not yet reached.

On 1400-foot level a drift is being run south,

on west wall, for Belcher line, which is now in 140 feet, at this point a crosscut east is in 40 feet, intended to top the north end of the ore body, and is being cautiously advanced on account of the body of water which the ledge contains, and which prevents sinking by winze from the 1300.

Crosscuts from this will be run east as progress is made, and as soon as the water is tapped, three winzes will be sunk from 1,300 to connect with this level for air.

On the 1,300 foot level the ledge consists of a pure body of ore, requiring no assorting, and anguring well for richness in deeper workings.

On the 1,200 foot level, the ore body was 60 to 100 feet in width. On the 1,300 foot level the ore body is 90 to 130 wide, and extends northerly 370 feet from Belcher line.

At a depth of 1500 feet, a new station is now being made, above which levels—should their mine increase in length and breadth to the extent that present developments promise—many years must elapse before the mine, as far as opened, can be exhausted. To timber this vast opening, six millions feet of timber is required annually, and in various avocations about the mine, the force employed is between five and six hundred men.

Last night it was excitedly reported that

Ballimore Consolidated

Had made a strike. At 9 o'clock p. m., Sup't Strother proceeded to the mine with a couple of Sharon's experts to prospect the new attraction, and being followed by a mob of curbstone sharps, on foot, the excitement was intense, the result being shown on the board this morning: "Balto. Con. struck another bunch yesterday, in their lower drift, about 120 feet from shaft, similar to their late discovery above, and from which a \$20 assay was had to-day." Only this, and nothing more. CANA.

Virginia, June 17th. 1873.

RICH STRIKE.—The Havana mine, one of the oldest locations in Ely District, has just developed a rich body of ore. The Record says assays go from \$200 to \$600 and the ledge is at least 8 ft. from wall to wall. This mine is on Spring Mountain, about 400 ft. east of the American Flag.

Stevens' Balance Slide Valve.

The accompanying cut represents Stevens' Balance Slide Valve for locomotive, stationary, and marine engines. It has been in use in a number of marine and other engines for nearly seven years. Mr. A. J. Stevens, the inventor, is general master mechanic on the Central Pacific Railroad, and resides at Sacramento. These valves have been in use for some time on the locomotives on that road. The valve is cheap in construction and durable in operation, having never in any instance caused trouble or delay to any engine using it.

By referring to the accompanying cuts, its operation will be seen.

B is the balance yoke fitted around the top of valve, and working stem tight against the inner surface of steam chest cover, and should be fitted so as to move on and off freely. SS are springs fitted into pockets in balance yoke, and resting on the back of the valve, for the purpose of holding the yoke, B, to its seat when steam is shut off. They should be adjusted so as to hold the yoke just up to its seat without causing friction. When the yoke or valve is worn sufficiently to require adjusting, it is only necessary to put shims of proper thickness under the springs, SS. T is a packing ring of type metal, and is cast in place. It is intended to make a steam-tight joint between the valve and yoke, and at the same time to allow the yoke to yield to expansion and contraction. This ring is made thickest at the base, or wedge-shape, so that a tight joint will be had when it is pushed up by the pressure of steam. W is a steam-way through the valve for the purpose of allowing steam to pass freely from end to end of the steam chest. RR are relief valves, and PP are passages to relief valves. These valves are simply pieces of 3/8-inch square iron, and have about 1/8 of an inch lift; the passages are holes 3/16 of an inch in diameter, drilled through the flange of the valve. These valves are intended to relieve the piston from back pressure. V is a vent hole communicating with the exhaust cavity of the valve. A is a 2-inch air valve of the common globe, check pattern. This valve is intended to admit air to the cylinder when the engine is moving and not working steam, and must in all cases be used on locomotives with this valve. A self-lubricator of some good pattern should be used in connection with the valve.

Great care should be observed in fitting up the steam chest to get the upper and lower seats parallel. The cover should have a bearing opposite the outside of the chest bolts, so as to prevent the cover springing up in the center by the strain on the bolts. As this valve is exposed to little or no pressure, it can and should be made quite thin and light in all its parts. A copper gasket is used to make the lower steam chest joint; the top joint is usually ground, but can be made with a copper gasket also. The valve is so constructed that it is exposed to very little pressure, and consequently runs with a small amount of friction.

Some idea of the value of this valve may be had from the following condensed mileage statement of engines running on the Central Pacific Railroad, and using Stevens' slide valves:

No. of Engine.	Kind of Fuel.	Date Balance Slide Valve put in.	Mileage run since put in.	Value of Fuel consumed.	Value of Balance Slide Valve.
3	Coal	August, 1871	78,400	78,400	20,000
15	Coal	August, 1871	47,983	47,983	20,000
23	Coal	March, 1872	31,700	31,700	20,000
39	Coal	October, 1872	14,255	14,255	20,000
66	Coal	February, 1871	67,749	67,749	20,000
94	Coal	February, 1871	63,140	63,140	20,000
11	Coal	December, 1870	58,200	58,200	20,000
75	Coal	August, 1871	52,698	52,698	20,000
89	Coal	March, 1872	26,090	26,090	20,000
137	Coal	October, 1871	36,415	36,415	20,000
122	Coal	April, 1872	29,364	29,364	20,000
123	Coal	April, 1872	26,090	26,090	20,000
146	Coal	February, 1871	39,934	39,934	20,000
150	Coal	March, 1872	18,594	18,594	20,000
153	Coal	September, 1872	15,750	15,750	20,000
155	Coal	December, 1872	12,100	12,100	20,000
156	Coal	July, 1871	67,148	67,148	20,000
162	Coal	March, 1871	72,401	72,401	20,000
172	Coal	May, 1870	51,901	51,901	20,000
173	Coal	November, 1872	11,575	11,575	20,000
176	Coal	March, 1865	81,630	81,630	20,000

From this it will be seen that at the time the statement was made on only engines 15,176 and 94 had had valve seats faced, since running with this slide valve. Some 17 new engines are being fitted with it. Mr. Stevens has numerous testimonials from prominent engineers certifying to the efficiency of the valve. He guarantees it to run 50,000 miles if fitted up according to the foregoing directions. Mr. A. J. Stevens, of Sacramento, will furnish working drawings and all information required by those wishing to make and use this valve.

THE HASKINS' perjury case in relation to changing the records of mining locations has been decided and the charges against Haskins were not proven. The testimony went to show that Haskins was very particular in keeping correct copies of the records, and that he personally had not meddled with them. No evidence was elicited showing who had made the alteration. The case has excited considerable interest.

The Meadow Lake Mines—A Deserted City.

Town and Mining District of Meadow Lake.

Not a locality in California has a more melancholy history than this whence I write. In the adjacent State of Nevada it would be easy to parallel the untoward fortunes of Meadow Lake, and even on this side the mountains one meets with many a mining town as solitary and ruinous as this. But these towns lived their day and accomplished the end for which they were built. Having sprung up for the accommodation of the mines in the neighborhood, they naturally want to decay when the latter become impoverished. Not so here; this place has become a desolation, not because the mines have been exhausted as in California, nor because it was without mineral resources to sustain it, as was the case with many of the ephemeral towns of Nevada. This district abounds with gold-bearing quartz lodes, many of them of large size and undoubted value, none of which have been worked out, or even more than fairly prospected; the trouble having been that the gold the ores are known to contain could not be saved by any process heretofore employed in working them.

Discovery and Locality of the Mines—Character of the Country, Etc.

The mines here were first discovered ten years ago the present summer, though but little noticed until two years latter, when a population of four or five thousand were drawn hither, the most of them coming from Western Nevada and the adjacent mining districts of California. The town was estimated at one time to contain over four thousand inhabitants. It now contains two, between which number and none at all the population has fluctuated for the last five years. Henry Hsrtly, hunter and miner, has been the sole resident of the place for the past two winters. He considers it a hopeful indication that the population should have doubled within the last thirty days, and remarked on my arrival that the sight of three persons on the streets at once imparted to them quite a thronged appearance.

The Meadow Lake District, which derives its name from the artificial lake created here by the South Yuba Canal Company for reservoir purposes, lies on the westerly slope of the Sierra Nevada very near the summit. It has a mean altitude of about 7,000 feet, and is situated twelve miles by the wagon road, in a northerly direction from Cisco, nearest station on the Central Pacific Railroad. The country in the vicinity is rugged and desolate, the mountain peaks and ridges consisting almost wholly of bald and timberless masses of ecinitic granite. On their tops and northerly slopes the snow usually lies till midsummer, feeding numerous streams of pure cold water, that flowing down their sides unite and form the upper tributaries of the South Yuba. A great deal of snow falls here in the winter, the accumulation generally reaching a depth of twenty-five or thirty feet.

Summer Pasturage—Mountain Lakes and Reservoirs.

The valleys and lower mountain slopes of this region are well timbered and afford a great deal of summer pasturage, this being one of the summer resorts of the California stockmen. The overflowing of a large meadow, the site of the present lake, destroyed much good feed, whereat the cattle owners felt much aggrieved. Their stock range here threaten soon to be encroached upon, it being the intention of the Canal Company to convert Fordyce Valley, another of these natural meadows, lying a few miles further south on the main fork of the South Yuba, into a reservoir the present summer. It may seem a pity to destroy in this way the green pasturage so much needed by our stock growers during the dry season, but the gold that the water so stored up will wash out in a single year, amounts to the value of the cattle that might have been fed upon the grass many times over; and should it ever come to pass that this water is no longer required for mining purposes then these dams can be removed and this submerged land be restored in a few years to its original condition.

The damming up of Fordyce Valley will require a structure 2,500 feet long and 60 feet high, whereby an area of 1,500 acres will be covered from 40 to 60 feet deep. The creation of Meadow Lake, on the westerly edge of which the town is situated, necessitated the building of a dam 1,150 feet long and 42 feet high. It overflows 500 acres to a depth of 30 feet, and when full affords enough water to keep the company's several large ditches supplied for two weeks or more. This year they have not been able to fill it more than two-thirds full, abridging their supply accordingly. This reservoir has scarcely half the capacity of that to be built at Fordyce Valley.

Area and Geology of the District—Richness and Obstinacy of the Ores—Mills, Processes, Production, Etc.

The district covers an area of about fifty square miles and is altogether Alpine in its topography and surroundings. To the north and east the main Sierra rises to a height of 10,000 feet, while standing centrally in the district and between the town and the railroad "Old Man" Mountain lifts itself to an equal

height, a precipitous and isolated mass of glistening granite. The prevailing formation is sienite, through which the lodes of auriferous quartz course mostly in a northwesterly and southeasterly direction. They are quite numerous, several hundred having been located in the district; appear to be regular in their structure and are of a fair size, generally ranging from two to eight feet in thickness, a few being much larger. The ore carries an unusually large percentage of sulphurets, the latter composing about one-sixth of its bulk. Both the sulphureted and the free gold, of which the latter there is a good deal in the rock, appear to be combined with some substance that almost totally defeats amalgamation, nor has any other plan yet been tried here whereby the gold could be saved; hence the failure of all mining operations undertaken and the final abandonment of the district. The sulphurets show a value of about \$60 per ton by assay, and ought to pay well could they be effectually and cheaply worked. Of these several methods of chlorination tried here the Plater process came the nearest to achieving success, but even this did not answer the purpose, and the miners becoming discouraged after repeated failures, finally gave up and for the last five or six years scarcely anything has been done or attempted in the district. During the years '65 and '66, the most active period in the history of Meadow Lake, eight quartz mills were erected in the district, carrying an aggregate of 72 stamps, and costing over \$200,000. With the exception of the U. S. Grant, located six miles south of the town, none of them ever accomplished much, the entire production of the mills and chlorination works not exceeding \$100,000. The total expenditure incurred on account of working the mines, building mills, towns, roads, etc., not to include material and work otherwise bestowed, nor the labor of those not employed on wages, is supposed to have reached \$2,000,000. Meadow Lake has therefore been able to return us yet but one dollar for twenty spent in helping to develop its mines.

A Glean of Hope.

Within the past two days Mr. Matman, of Nevada City, has arrived in this district, bringing with him the fixture and material for erecting chlorination works after the style of those successfully operated by him for a number of years near that town. His works, on a moderate scale for the present, will be put up at the U. S. Grant mill, where some 500 tons of sulphurets have been collected. Mr. Matman has experimented on a portion of these, and found no difficulty in saving the gold up to a close percentage, and feels quite confident that he can conquer the obstacle that has so long stood in the way of success here. He will have his works completed in the course of a month or six weeks, and he will be able to make determinate tests very soon thereafter. A good deal of interest attaches to this experiment, since we may consider the case of Meadow Lake almost hopeless if the difficulties here should baffle one who has made the treatment of sulphureted ore a specialty. Though attended with the best results, this undertaking could hardly put much life into Meadow Lake the present season, as the snow falls early here and not much could be done during the winter. But should it turn out happily it would be likely to revive business in the district next year and perhaps insure for it a prosperous future.

A Sad Spectacle—The Vacant City in the Wilderness.

If anything were needed to emphasize one's convictions of the folly of premature action in mining affairs, a visit to this locality ought to have that effect. A more striking example of undue haste and foolish expenditure can hardly be instanced even in California. Quite a large and handsome town, besides two or three small hamlets, seven costly mills and nearly as many chlorination works were rushed up here before ever it was known whether any of them would be needed or not. After such a long abandonment many of these improvements are now in ruins, the snow having crushed in some while the tempests and the fallen timber have demolished others. The spectacle of a town as large as this standing afar in the wilderness, surrounded by gloomy mountains and emptied of its inhabitants is not a pleasant one. Had the place been burnt up with fire or otherwise wholly laid waste, we would contemplate its fate with less of sadness. The sight of so many buildings, some of them large and costly structures, and not a few still remaining partially furnished, but all silent and deserted, fills one with a feeling of awe that an utter ruin would fail to inspire. As we look upon them we feel that there has been here worse wrecks than these before us, wrecks of fortune and of hopes, of brilliant prospects and promising schemes, all frustrated by a single metallurgical difficulty that could neither be foreseen or overcome.

It is easy to see what uses a majority of these buildings were put, the signs denoting the fact, being still upon the most of them. Or, if one is curious, he may enter and inspect the premises, the doors of such, in many cases, stand wide open. In nearly one-half the houses there still remain stoves, tables, bureaus, bedsteads and such other bulky articles of furniture as could not be well removed, and sometimes also more costly and portable wares. One establishment is to be seen tolerably well outfitted with beds, crockery, cooking utensils, and many other things necessary for carrying on a good-sized hotel. Here is a gaily-papered drinking saloon, with its bar and other paraphernalia now covered with dust, and hard by

a restaurant, its tables half set and its ample cooking range still in good condition for service. A capacious oven erected in the rear of a comely edifice attests the fact announced on the sign without that Peter Bauer once conducted a bakery within; and a stranger may know that a son of St. Cripin must have plied his calling opposite the pile of lether chips, if the wooden boot swinging at the door were not conclusive on that point. The hall of the "Board of Brokers" still stands confronting the office of one of the craft, who, through a sign conspicuously displayed, advises the public that he buys and sells Meadow Lake stocks and other first-class securities. And so we might go on and find here the evidences of all those diverse vocations, useful and otherwise, so apt to spring up with mushroom growth in a precocious mining town.

Many of the largest buildings, being those most exposed to destruction from this cause, have been broken down by the snow and now lie splintered and crushed into magnificent piles of oven wood. Several of the quartz mills have shared a like fate, that of the Mohawk Mining Company, standing close on the shore of the lake, having fallen into the water, where in disjointed fragments the super-structure is drifting about leaving the ponderous machinery quite out of doors.

From the foregoing it will be seen that Meadow Lake is an altogether dilapidated town, the history whereof is well represented by its present woe-begone and hapless condition. Let us hope that a better day will soon dawn upon it, re-peopling its deserted tenements at least in part, and that the mines here, the master impediment being removed, will return the capital and labor spent upon them a fair reward. Yet of all this we may not be too sanguine; nor can the resuscitation of the district in any event be other than slow and somewhat delayed. Meantime, it will be well if the mistakes committed here shall serve as a useful warning to others, saving them from the hard fortune that befel the over-confident founders of Meadow Lake.

Omnibus Law.

A Philadelphia court has made a decision that seems to give general satisfaction. It is, that when the seats are full, it is not lawful to charge for admission. The ticket of admission implies that you are to be seated. Though this decision was at the suit of a person for return of his money, because he had to stand in a theater, the just principle of law applies also to omnibuses. In Paris, this law is rigidly enforced. Coaches are allowed 14 passengers inside and 12 on the impensale—that is, seats on top, which are half price.

There should be some regulation here. We suggest larger coaches, or French top-seats at half rates.

Omnibus tickets are paper currency, and probably against the law. It is vexatious to be obliged to buy tickets not interchangeable, and to have to pay rates not represented by any currency, for single fares. What the public wants is a uniform price, say five cents, and no paper currency. This would be justice, and an equal regard for the rights of both parties.

TEMPERATURE ON RAILROAD EXPENSES.—The report of Mr. Robinson, Locomotive Superintendent of the Great Western of Canada, shows very strikingly the effect of severe weather on train expenses. While the time table calls for 12,069 hours of locomotive service on freight trains for January last, the freight locomotives were actually under steam 18,379 hours. This increase of 50 per cent. must have extended, or nearly to the same extent, to fuel consumption, locomotive and train service and to repairs probably in a greater proportion.

MR. T. P. Woon, of Chesterfield, has invented an ingenione and effective self-feeding corking machine. The corks are placed in a large hopper over the machine, where they are kept in a continual state of agitation, and drop down a tube, in which there is an arrangement similar to that in a shot-pouch: This permits only one cork to pass at a time, which is admitted into a cylinder, from which a plunger drives it into the bottle.

THE GLADIATOR TUNNEL, above the Illinois and between the Emma and Flagstaff mines, Utah, is in 490 feet.

THE HOLLY WATER WORKS at Sacramento have been tested and found to work satisfactorily.

RAWLINGS, Wyoming Territory, is excited over the finding of gold in the red hematite iron beds.

CARSON MINT.—W. Hopkins has been appointed Assayer of the Carson Mint, by the President.

MINERS continue to arrive in Trinity from Nevada, Placer and other counties.

MORMON BASIN is another mining camp with favorable prospects for the season.

HOISTING WORKS will soon be put on the Dunderberg mine at Eureka.

THE CARSON MINT last month received as deposits \$1,012,506.

PROCTOR BULLION shipments last week amounted to \$90,000.

Gold in Napa County.

The quicksilver excitement in this vicinity of the past two months has been the agent, through the numerous prospectors, of the discovery and full development of one of the most valuable gold and silver ledges on the Pacific Coast. That gold and silver has existed in the gulches about three miles northwest from this place has been known for the past fifteen years, but not in sufficient quantities to pay, as has been repeatedly tested by the old residents hereabouts. All the auriferous quartz that has heretofore been discovered near here, has been in boulders or what is termed "float rock." About four months ago a perfect quartz lode was discovered on the farm of Josiah Hasbrouck, some six or seven miles west of this place, and in assaying for quicksilver, of which there was strong indications, gold and silver in about equal quantities, were found, in value \$18.80 per ton. The ledge was so clearly defined that it was readily traced in a northeasterly direction to almost the summit of St. Helena mountain, where it crops out boldly some thirty or forty feet high, and the thick covering of moss has deceived all who have seen it, who took it to be sandstone or slate. The entire ledge, which is traceable some six or seven miles, has been taken up, claimed and recorded, and the developments of the past week prove the ledge to be of astounding value. Chips broken from the exposed ledge were assayed by John Hewston, Jr., at the California Refinery, and proved to contain \$70 per ton in gold and silver. Rock from the tunnel of the St. Helena Gold and Silver Mining Company, about three hundred yards off the toll-gate on the Harbin Springs road, was assayed last Saturday and was found to contain \$126 per ton—the proportion of silver increasing as the tunnel progresses, which is now in some twelve feet. The ledge appears to be about six feet wide on top and gradually widening as they go down. Mr. Alex. Badlam, the Superintendent of the mine, brought down yesterday quartz taken from the surface containing free gold, and several beautiful specimens containing pyrites of iron and chlorides of silver and free gold. The rock has the precise appearance of that from the Comstock Ledge, and is pronounced by competent judges to be the only well defined and perfect auriferous quartz ledge on the Coast Range. Over five hundred persons have visited the mine within a week, among whom we noticed Hon. J. P. Jones of Nevada, Milton Lambeth, mining expert, General G. S. Dodge, John Landers, James A. Pritchard, G. F. Kellogg, James McCue, Speaker Blaine, J. A. Mars, and many others who are astonished at the discovery. Work is progressing rapidly and if the development continues as commenced, the future of Calistoga will be in no particular problematical. The original locators of this valuable mine are Richard Swift and John Evans, of this place, and Col. C. S. Bulechely, Alex. Badlam, Jr., and J. L. Sanford, of San Francisco, who may be congratulated upon their good fortune, for, without doubt, the mine could be sold for hundred of thousand now, without another dollar being spent upon it.—*Calistoga Tribune*.

The above item appears in the *Tribune* under the head of "Great Auriferous Discovery—Is it Another Comstock Ledge," etc. Now we are pleased to hear of new mining discoveries wherever they may be, and particularly in California, but would mildly suggest a few items to the *Tribune*. In the first place a period of four months is hardly time to prove whether a "mine" is a "true fissure vein" or not, so the "competent judges" might be mistaken in their statement that this claim is the "only auriferous quartz ledge in the Coast Range." Moreover 500 assays of gold rock will not prove as much concerning the ore as will a run of 25 or 30 tons in the mill. Lots of mines turn out gold ore assaying \$100 per ton that will not pay to work; a fact which hard and stern experience has impressed upon many an incipient investor. "The proportion of the silver increases as the tunnel progresses" is good, considering the same sentence tells us that said tunnel is in only 12 feet. The "increase" must be very sudden in so short a distance. Tracing a ledge by its croppings does not amount to very much, so far as its paying is concerned. We have seen a continuation of croppings several miles in length and only one place on which it would pay at all; moreover after sinking about 50 feet the ledge "pinched" and when it widened again there was not anything in it.

We do not know how far they have got down on this ledge, though we are told that it is "6 feet wide on top and widening as they go down." That is an old phrase, need indiscriminately by many who have no right to do so. The *Tribune* man tells us that the lucky owners can, without doubt, sell the mine for "hundred of thousand" now, without another dollar being spent on it. If they can do so they'll be as smart as Arnold was in selling diamond fields. If the editor of the *Tribune* can find any man in California who will pay a tenth of a hundred thousand for a "mine" with a 12 foot tunnel, in Napa county, with ore that "assays" \$136 per ton, and has never been milled or tested in any other way, he had better come down on California street and go into the business, for he can make more money "getting capital" than in running a country paper. We hope the *Tribune* will keep us posted in "new developments" and tell us when ever a mill is put up.

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Remittances of money, made by individual inventors to the Government, sometimes miscarry, and it has repeatedly happened that applicants have not only lost their money, but their inventions also, from this cause and consequent delay. We hold ourselves responsible for all fees entrusted to our agency. The principal portion of the patent business of this coast has been done, and is still being done, through our agency. We are familiar with, and have full records, of all former cases, and can more directly judge of the value and patentability of inventions discovered here than any other agents.

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INVENTORS.**Something New for the Kitchen,****THE Aerating Egg Beater.**

Various devices have been presented to the public for heating eggs, but nothing, we think, equal to the one herein shown. This, in fact, is the only aerating device ever made, and is very properly called the "Aerating Egg Beater."

This Beater, as will be seen by reference to the engraving, is simply a tin can with a cone bottom and a cone dasher, the lower portion of the dasher being perforated with very small holes, as shown. Under this arrangement the upper portion, when forced down, fills with air, which is forced through the egg, thereby finely dividing and thoroughly aerating the mass. It heats one egg as well as half a dozen. For further particulars address

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A one-half interest (1,300 feet) in the mine is offered for the sinking of 40 additional feet—the present depth of shaft being 60 feet, well timbered throughout. Parties will have to furnish everything connected with working the mine. Assay value at depth of 48 feet, from State Assay Office, \$10 in gold; silver, \$3 per ton making \$13 per ton.

For further information apply to ml5 6td-8ts JOHN J. COLLINS, Lodi, Cal.

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Paper Rulers and Blank Book Manufacturers.
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Are prepared to plate articles of all descriptions, of any metal. Outlets, Liquor Flasks, Pistols, Guns, Swords, Bridle Bits, Pole Crams, Hub Bands, Dash Rails, and all articles of household hardware plated at short notice, and warranted. Nickel Plating never fades or corrodes, always retaining its polish until the article is worn out. WORK at the KIMBALL MANUFACTORY OFFICE, Cor. Fourth and Bryant Streets. 12v26-3m

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This Hotel has been newly furnished, and is situated in a central and healthy location, and is one of the few Hotels in San Francisco conducted on Temperance Principles.

BOARD, PER WEEK, \$3.50. BOARD AND LONGING, \$4 to \$5. SIX MEAL TICKETS FOR \$1.
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SIZE, 40 BY 56 INCHES; SCALE, 8 MILES TO AN INCH.

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Metallurgy and Ores.**RODGERS, MEYER & CO.,****COMMISSION MERCHANTS,****ADVANCES MADE**

On all kinds of Ores, and particular attention

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Silver-Plated Copper Amalgamating Plates, for Saving Gold.



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Varney's Patent Amalgamator.**These Machines Stand Unrivaled.**

For rapidly pulverizing and amalgamating ores, they have no equal. No effort has been, or will be spared to have them constructed in the most perfect manner and of the great number now in operation, not one has ever required repairs. The constant and increasing demand for them is sufficient evidence of their merits.

They are constructed so as to apply steam directly into the pulp, or with steam bottoms, as desired.

This Amalgamator Operates as Follows:

The pan being filled, the motion of the muller forces the pulp to the center, where it is drawn down through the aperture and between the grinding surfaces. Thence it is thrown to the periphery into the quicksilver. The curved plates again draw it to the center, where it passes down, and to the circumference as before. Thus it is constantly passing a regular flow between the grinding surfaces and into the quicksilver, until the ore is reduced to an impalpable powder, and the metal amalgamated.

Settlers made on the same principle excel all others. They bring the pulp so constantly and perfectly in contact with quicksilver, that the particles are rapidly and completely absorbed.

Mill-men are invited to examine these pans and settlers for themselves, at the office, 229 Fremont Street, San Francisco.

Nevada Metallurgical Works.**RIOTTE & LUCKHARDT,**

Consulting Mining Engineers and Metallurgists, No. 21 First St., S. F.

WORKING TEST MADE BY ANY PROCESS—TESTING OF PROCESSES.

Plans furnished for the most suitable Process for Ores.

Assaying in all its Branches.

Analysis of Ores, Minerals, Waters and all other substances.

Special attention paid to the mining and metallurgy of Quicksilver. 26v11-6m

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For all Laboratory and Manufacturing Purposes

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Platinum Scrap and Ore purchased.

PATENTS & INVENTIONS.

Telegraphic List of U. S. Patents Issued to Pacific Coast Inventors.

FROM OFFICIAL REPORTS FOR THE MINING AND SCIENTIFIC PRESS, DEWEY & CO., PUBLISHERS AND U. S. AND FOREIGN PATENT AGENTS

By Special Dispatch, Dated Washington, D. C., June 17th, 1873.

FOR WEEK ENDING JUNE 3d, 1873.

EXPLOSIVE COMPOUND OR GIANT POWDER.—Egbert Judson, assignor to the Giant Powder Co. and Atlantic Powder Co., S. F., Cal.

ORE FEEDER FOR GRINDING AND CRUSHING MILLS.—Charles P. Stanford, S. F., Cal.

RAILROAD SWITCH.—John T. Linthicum, assignor to Ira Gilchrist, Vallejo, Cal.

HYDRAULIC ELEVATOR.—Timothy Stebbins, S. F., Cal.

TELEGRAPH POLES.—Thomas J. McCarver, James Athey and Berryman Jennings, Oregon City, Oregon.

*The patents are not ready for delivery by the Patent Office until some 14 days after the date of issue. NOTE.—Copies of U. S. and Foreign Patents furnished by DEWEY & CO., in the shortest time possible (by telegraph or otherwise) at the lowest rates. All patent business for Pacific coast inventors transacted with greater security and in much less time than by any other agency.

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co's Scientific Press American and Foreign Patent Agency, the following are worthy of mention:

IMPROVED REFINER FOR DISTILLING PURPOSES.

The preparation of alcohol, or any fermented spirituous liquor, is divided into three distinct stages or operations—fermentation, distillation and rectification. The latter is found the most difficult and at the same time it is the most essential to a good article. Indeed, so difficult is the process of rectification that many distillers do not perfect their products, but pass them over to the rectifying distiller, whose business it is to remove from them any contaminations which are disagreeable or injurious. Even where the producer conducts his operations to their final result, the rectification process is usually done apart and in a distinct portion of the premises.

The object of the invention, herewith presented, is to place within the reach of the distiller, at a reasonable cost, a simple and effective device by which the process of refining may be more readily performed, and by the distiller himself, and used, if desired, directly in connection with the still.

This device consists mainly in a novel construction of an elongated vessel, having diaphragms placed across it at intervals, which diaphragms are perforated, alternately at top and bottom, for the passage of the vapors. Each compartment thus formed has a pipe leading out of it into a corresponding compartment in another vessel placed below the one first described. The compartments in the second vessel are so arranged that whatever oils, fluids, etc., may be condensed in the several compartments of the vessel above, pass out thence, through the pipe above mentioned, into a corresponding compartment in this lower vessel, and from which they may be drawn off at leisure, or passed automatically again to the still for redistillation, and further elimination of any spirituous liquor which may have been deposited in the first instance with the contaminations.

These vessels and their compartments may be constructed of any number and size, by which means the vapors of the still may be made to pass any distance, with, of course, decreasing temperature under which the various oils and other impurities which pass out of the still, may be condensed as they meet the various temperatures required for such condensation, until nothing but the pure spirituous vapor is left to be deposited in the vessel designed for its reception. The proper temperature is kept up by a water or steam jacket which surrounds the first described vessel.

We have examined samples of spirits which have been refined by this apparatus; the change in the character of the liquors thus produced is really surprising, and such as to commend the device as a most important improvement in the art to which it is applied. We understand that the inventor, Mr. William Neil, of No. 311 Mission street, in this city, has just received a patent for this invention through the MINING AND SCIENTIFIC PRESS Patent Agency, and has also made application for foreign patents for the same.

ACCOUCHMENT COTCH.—E. L. Moore, San Francisco, Cal. Too little attention has heretofore been given to improving the appliances which are requisite for alleviating the suffering of women during the accouchment period. We are too prone to think that nature and the physician will take care of such things without special aid. This patent is for a couch which is provided especially for this purpose, being provided with all of the conveniences and appliances which have been found to be necessary during the confinement. It will undoubtedly prevent much suffering and possibly save many lives.

A NEW POCKET FASTENING.—Mr. J. W. Davis, formerly of Reno, Nevada, but now residing in this city has just received through the SCIENTIFIC PRESS PATENT AGENCY, letters patent for an improvement in fastening the seams of pockets. The improvement consists in the employment of a metal rivet or eyelet for fastening the seams. Simple as this device seems nevertheless it is quite effective, and we do not doubt that his manufacture, of overalls especially, will become quite popular amongst our working men, as the overalls are made and cut in the style of the best custom made pants. Nothing looks more slovenly in a workman than to see his pockets ripped open and hanging down, and no other part of the clothing is so apt to be torn and ripped as the pockets. Besides its slovenly appearance, it is inconvenient and often results in the person losing things from his pockets. Levi Strauss & Co., of this city are sole agents for the new manufacture, and will soon place them in the market in large quantities, so that our miners, farmers and workmen can supply themselves with superior overalls.

ORE FEEDER FOR QUARTZ MILLS.—T. A. Cochran, Jamestown, Cal. This invention relates to an improvement in the ore-feeders which are operated automatically from the tappet by the drop of the stamp, to feed the ore beneath the stamp in quartz mills. The improvement consists in the employment of an endless belt operated by a ratchet and spring-pawl, the pawl being long enough to extend up to, and receive a stroke from the tappet at each descent of the stamp stem. This operation causes the endless belt to travel towards the battery. The ore is placed in a hopper over the belt so that it will fall upon the belt and be delivered into the battery as the belt travels.

Heretofore it was found impracticable to feed wet ore by the self-feeders in use, but by this device wet ore is fed as evenly and regularly as dry ore.

COPPER.—James Lewis and Son's Liverpool Report on ores and metals, dated 31st ult., states that quotations of copper ore on that date in Liverpool were £82 to £85 10s for Chili ore on the spot. Ore and Regulus nominal at from 16s to 17s per unit. The transactions in ore and Regulus have been confined to the Swansea Ticketing sale on the 13th of May which averaged 15s 7½d and 16s 2d for Cape ore, or a fall of about £7 10s per ton of copper. The labor question and the continued high price of coals unsettle everything and makes the smelters very cautious in their operations. Chili exports to let of May amount to 19,327 tons fine against 26,023 tons in same time last year. Stocks of West Coast Produce are estimated at 21,659 tons fine against 20,460 on May 1st.

Time Tests the Merits of all Things.

1840 For Over 30 Years, 1873

PERRY DAVIS' PAIN-KILLER

Has been tested in every variety of climate, and by almost every nation known to Americans. It is the constant companion and inestimable friend of the missionary and the traveler, on the sea or land, and no one should travel on our Lakes or Rivers without it. Since the PAIN-KILLER was first introduced, and met with such extensive sale, many Liniments, Reliefs, Panaceas, and other Remedies have been offered to the public, but not one of them has attained the truly enviable standing of the PAIN-KILLER.

WHY IS THIS SO? It is because DAVIS' PAIN-KILLER is what it claims to be, a Reliever of Pain.

Its Merits are Unsurpassed.

If you are suffering from Internal Pain, Twenty to Thirty Drops in a Little Water will almost instantly cure you. There is nothing to equal it for

Colic, Cramps, Spasms, Heart-burn, Diarrhea, Dysentery, Flux, Wind in the Bowels, Sour Stomach, Dyspepsia, Sick Headache, &c., &c.

In sections of the country where

Fever and Ague

Prevails, there is no remedy held in greater esteem. Persons traveling should keep it by them. A few drops, in water, will prevent sickness or bowel troubles from change of water.

From foreign countries the calls for PAIN-KILLER are great. It is found to

CURE CHOLERA WHEN ALL OTHER REMEDIES FAIL.

WHEN USED EXTERNALLY, AS A LINIMENT, nothing gives quicker ease in Burns, Cuts, Bruises, Sprains, Stings from Insects, and Scalds. It removes the fire, and the wound heals like ordinary sores. Those suffering with RHEUMATISM, GOUT, or NEURALGIA, if not a positive cure, they find the Pain-Killer gives them relief when no other remedy will.

It Gives Instant Relief from Aching Teeth.

Every House-keeper should keep it at hand, and apply it on the first attack of any Pain. It will give satisfactory relief, and save hours of suffering.

Do not trifle with yourselves by testing untried remedies. Be sure you call for and get the genuine PAIN-KILLER, as many worthless nostrums are attempted to be sold on the great reputation of this valuable medicine. Directions accompany each bottle.

PRICE—25 cts., 50 cts., and \$1 per bottle.

WATER SUPPLY.—The report that water for mining purposes is likely to fail soon at Moore's Flat, Nevada county, is incorrect. From Snow Point all along the ridge down to French Corral, the supply will be full until winter.

THE UTAH MINE, Washoe, has been started up again, in charge of Mr. Owen, late foreman of the Kentuck. The shaft, which is nearly full of water, is being pumped out.

SMELTING WORKS.—Chicago intends starting another set of smelting and refining works to cost \$200,000.

Meetings and Elections.

CITY RAILROAD Co.—June 14. Directors: Robert B. Woodward, Allan G. Gladding, M. P. Jones, Jos. H. Moore, J. Hyde, E. Dewitt, R. Kent. At the organization of the Board the following officers were elected: R. B. Woodward, President and Treasurer; A. G. Gladding, Vice-President; M. E. Willis, Secretary; E. Dewitt, Superintendent.

ALPHA CONSOLIDATED M. Co.—June 16. Trustees: J. D. Fry, W. M. Lent, L. Kerstie, H. C. Kihne, and A. K. P. Harmon.

HIDDEN TREASURE CONSOLIDATED M. Co.—June 16. Old Board of Trustees re-elected.

ORANGE CONSOLIDATED M. Co.—June 16. Trustees: J. A. Nesbitt (President), J. Chamberlain, E. H. Rixford, Secretary, W. F. Lamb, and N. P. Copp.

New Incorporations.

The following companies have filed certificate of incorporation in the County Clerk's office S. F. THOMPSON COAL M. Co.—Object: Coal mining and the purchase and sale of coal and coals in Cal. Directors, Ichabod Chase, D. H. Thompson, W. H. Parsley, Geo. H. Smith and A. Crockett. Capital stock, \$1,000,000. ADRIAN M. M. Co., June 19.—Location, State of Nevada. Directors: Wm. O. Keeper, J. W. Tripp, W. Meeks, F. A. Rakow, O. F. Mohrig, E. W. McGraw, and J. B. Houghton. Capital stock \$500,000 in 50,000 shares.

Try Dr. Evory's Diamond Catarth Remedy. Only 50 Cents.

Says John to Nance, you look so bright, Your eyes they sparkle, like a star. Oh! yes, says Nance, Dr. Evory's remedy Has cured that horrid, bad catarth.

OUT OF THE FOG AT LAST.—Dr. Evory has discovered the only sure cure for Catarth and Colds. One bottle gives immediate relief, and a few bottles effect a cure. All we ask is a trial. If your druggist don't have it, send to Dr. A. Evory & Co., 9 Post street, S. F. It only costs 50 cts. 14725-3m

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WE WILL CHANGE THE ADDRESS FREE for any subscriber who notifies us in writing of his new address, with the OLD P. O. address to enable us to find his name among thousands of others.

DANIEL WELLINGTON, of Virginia City, Nevada, is requested to communicate immediately with this office.

HYDRAULIC MINE FOR SALE.

EXTENSIVE GRAVEL DEPOSIT—worked successfully for years; first-class water rights and facilities for work on large and economical scale; Title, U. S. Patent; situated in Placer County, one-sixth interest for only \$5,000. Apply to F. C. M. du BRUTZ, 544ndstr 504 Kearny street, San Francisco.

Mining and Other Companies.

Owing to the time necessary to mail the present large edition of the M. & S. Press, we are obliged to postpone the following closing—which is the very latest hour we can receive advertisements.

Alpine Gold Mill and Mining Company—

Location of principal place of business, San Francisco, California.

NOTICE.—There are delinquent upon the following described stock, on account of assessment levied on the 13th day of May, 1873, the several amounts set opposite the names of the respective shareholders, as follows:

Names.	No. Certificate.	No. Shares.	Amount.
Felton, C. N.	25	100	\$100 00
Ives, G. J.	30	50	50 00
Luther, T. M.	26	100	100 00
Richardson, E. A., Trustee.	1	500	500 00
Richardson, E. A., Trustee.	2	500	500 00
Richardson, E. A., Trustee.	3	500	500 00
Richardson, E. A., Trustee.	4	500	500 00
Richardson, E. A., Trustee.	5	500	500 00
Richardson, E. A., Trustee.	6	500	500 00
Richardson, E. A., Trustee.	7	500	500 00
Richardson, E. A., Trustee.	8	500	500 00
Richardson, E. A., Trustee.	9	500	500 00
Richardson, E. A., Trustee.	10	500	500 00
Richardson, E. A., Trustee.	11	500	500 00
Richardson, E. A., Trustee.	12	500	500 00
Richardson, E. A., Trustee.	13	500	500 00
Richardson, E. A., Trustee.	14	500	500 00
Richardson, E. A., Trustee.	15	500	500 00
Richardson, E. A., Trustee.	16	500	500 00
Richardson, E. A., Trustee.	17	500	500 00
Richardson, E. A., Trustee.	18	500	500 00
Richardson, E. A., Trustee.	19	500	500 00
Richardson, E. A., Trustee.	20	500	500 00
Richardson, E. A., Trustee.	21	500	500 00
Richardson, E. A., Trustee.	22	500	500 00
Richardson, E. A., Trustee.	23	500	500 00
Richardson, E. A., Trustee.	24	500	500 00
Richardson, E. A., Trustee.	25	500	500 00
Richardson, E. A., Trustee.	26	500	500 00
Richardson, E. A., Trustee.	27	500	500 00
Richardson, E. A., Trustee.	28	500	500 00
Richardson, E. A., Trustee.	29	500	500 00
Richardson, E. A., Trustee.	30	500	500 00
Richardson, E. A., Trustee.	31	500	500 00
Richardson, E. A., Trustee.	32	500	500 00
Richardson, E. A., Trustee.	33	500	500 00
Richardson, E. A., Trustee.	34	500	500 00
Richardson, E. A., Trustee.	35	500	500 00
Richardson, E. A., Trustee.	36	500	500 00
Richardson, E. A., Trustee.	37	500	500 00
Richardson, E. A., Trustee.	38	500	500 00
Richardson, E. A., Trustee.	39	500	500 00
Richardson, E. A., Trustee.	40	500	500 00
Richardson, E. A., Trustee.	41	500	500 00
Richardson, E. A., Trustee.	42	500	500 00
Richardson, E. A., Trustee.	43	500	500 00
Richardson, E. A., Trustee.	44	500	500 00
Richardson, E. A., Trustee.	45	500	500 00
Richardson, E. A., Trustee.	46	500	500 00
Richardson, E. A., Trustee.	47	500	500 00
Richardson, E. A., Trustee.	48	500	500 00
Richardson, E. A., Trustee.	49	500	500 00
Richardson, E. A., Trustee.	50	500	500 00

And in accordance with law, and an order of the Board of Directors, made on the 18th day of May, 1873, so many shares of each parcel of said stock as may be necessary, will be sold at public auction at the office of the Company, No. 438 California street, San Francisco, California, on the 9th day of July, 1873, at the hour of 1 o'clock P. M. of said day, to pay said delinquent assessments thereon, together with costs of advertising and expenses of sale.

JOEL F. LIGHTNER, Secretary. Office, No. 438 California street, San Francisco, Cal. jun21

California Beet Sugar Company—Principal place of business, San Francisco. Location of works, Alvarado, Alameda County, California.

NOTICE is hereby given, that at a meeting of the Board of Directors, held on the 14th day of May, 1873, an assessment of Ten (\$10) Dollars per share was levied upon the capital stock of the Corporation, payable immediately, in United States gold coin, to the Secretary, at the office of the Company, No. 314 California street, San Francisco, Cal. Any stock upon which this assessment shall remain unpaid on the 31st day of June, 1873, will be delinquent and advertised for sale at public auction, and unless payment is made before, will be sold on the 1st day of July, 1873, to pay the delinquent assessment, together with costs of advertising and expenses of sale.

JOHN FRANKCONI, Secretary. Office, 314 California street, San Francisco, Cal. m29

Angels Quartz Mining Company—Principal place of business, 408 California street, San Francisco. Location of works: Angels Mining District, Calaveras County, California.

NOTICE.—There are delinquent upon the following described stock, on account of assessment (No. 36), levied March 4th, 1873, the several amounts set opposite the names of the respective shareholders as follows:

T. D. Mathewson	3	300	\$450 00
T. D. Mathewson	4	314	471 00
T. D. Mathewson	5	314	471 00
T. D. Mathewson	17	25	37 50
T. D. Mathewson (not issued)		325 5-7	488 57
J. H. Fish	(not issued)	342 5-7	514 29
J. H. Fish, Trustee	20	50	75 00
J. H. Fish, Trustee	21	50	75 00
J. H. Fish, Trustee	22	50	75 00
J. H. Fish, Trustee	23	50	75 00
Mrs. E. B. Fish	9	1000	1500 00
R. M. Anthony	18	100	150 00
R. M. Anthony (not issued)		45 5-7	68 57
R. M. Anthony	19	50	75 00
E. H. Sawyer	11	800	1200 00
E. H. Sawyer (not issued)		228 4-7	342 86
T. D. Mathewson	12	400	600 00
Geo. Cogswold	13	112 2-7	168 40

And in accordance with law and an order made by the Board of Directors, on the 4th day of March, 1873, so many shares of each parcel of such stock as may be necessary, will be sold at public auction, at the office of Maurice Dore & Co., 327 Montgomery street, San Francisco, Cal., on Monday, April 21st, 1873, at 2 o'clock P. M. of said day, to pay said delinquent assessment thereon, together with costs of advertising and expenses of sale. GEORGE CONGDON, Secretary. Office, Room No. 1, 408 California street, San Francisco, California (up stairs). as-3t

POSTPONEMENT.—Angels Quartz Mining Company. The above sale is hereby postponed for thirty days, at the same hour and place. ap19 GEORGE CONGDON, Secretary.

POSTPONEMENT.—Angels Quartz Mining Company. The above sale is hereby postponed until Wednesday, June 13, 1873, at the same hour and place. m17 GEORGE CONGDON, Secretary.

POSTPONEMENT.—Angels Quartz Mining Company. The above sale is hereby postponed until Wednesday, July 16, 1873, at the same hour and place. m17 GEORGE CONGDON, Secretary.

Bunker Hill Quartz Mining Company—Location of works, Amador, Amador County, California. Principal place of business, San Francisco, Cal.

NOTICE is hereby given, that at a meeting of the Board of Directors, held on the 5th day of June, 1873, an assessment of one dollar and twenty-five cents per share was levied upon the capital stock of the Corporation, payable immediately, in United States gold coin, to the Secretary, at his office, No. 19 First street, San Francisco, Cal. Any stock upon which this assessment shall remain unpaid on Monday, the 7th day of July, 1873, will be delinquent and advertised for sale at public auction, and unless payment is made before, will be sold on Monday, the 28th day of July, 1873, to pay the delinquent assessment, together with costs of advertising and expenses of sale. By order of the Directors. CHARLES H. KNOX, Secretary pro tem. j14

SPECIAL NOTICE.—At a meeting of the Board of Directors of the Bunker Hill Quartz Mining Company, held the 10th day of June, 1873, an assessment of one dollar and twenty-five cents per share was levied upon the capital stock of the Corporation, payable immediately, in United States gold coin, to the Secretary, at his office, No. 19 First street, San Francisco, Cal. Any stock upon which this assessment has been paid will be credited with the amount paid, upon Assessment No. 10. CHARLES H. KNOX, Secretary. San Francisco, June 5, 1873.

Central Land Company—Office and Principal place of business, 338 Montgomery street, Room 5, San Francisco, California.

NOTICE is hereby given, that at a meeting of the Directors, held on the 15th day of May, 1873, an assessment of one dollar and twenty-five cents per share was levied upon the capital stock of the Corporation, payable immediately, to the Secretary at the office of the Company, 338 Montgomery street, Room 5, San Francisco, Cal. Any stock upon which this assessment shall remain unpaid on the 10th day of July, 1873, will be delinquent and advertised for sale at public auction, and unless payment is made before, will be sold on the 28th day of July, 1873, to pay the delinquent assessment, together with costs of advertising and expenses of sale. F. B. HASWELL, Secretary. Office, 338 Montgomery street, Room 5, San Francisco, Cal. June 10th, 1873. j12-dss

Equitable Tunnel and Mining Company, Location of works, Little Cottonwood District, Utah Territory.

NOTICE is hereby given, that at a meeting of the Board of Directors, held on the 15th day of May, 1873, an assessment of one dollar and twenty-five cents per share was levied upon the capital stock of the Corporation, payable immediately, in United States gold and silver coin, to the Secretary, at the office of the Company, No. 35 New Merchants' Exchange. Any stock upon which this assessment shall remain unpaid on the 10th day of July, 1873, will be delinquent and advertised for sale at public auction, and unless payment is made before, will be sold on the 28th day of July, 1873, to pay the delinquent assessment, together with costs of advertising and expenses of sale. By order of the Directors. CHARLES S. HEALY, Secretary. Office, No. 35 New Merchants' Exchange, San Francisco, Cal. m6

POSTPONEMENT.—The day for deeming stock delinquent on the above assessment is hereby postponed until Wednesday, July 2d, 1873, and the sale thereof until Thursday, the 22d day of July, 1873. By order of the Board of Directors. CHAS. S. HEALY, Secretary.

Frear Stone Company of California—Principal place of business and location of works, City and County of San Francisco, State of California.

NOTICE is hereby given, that at a meeting of the Board of Directors, held on the 27th day of May, 1873, an assessment of one dollar and twenty-five cents per share was levied upon the capital stock of the Corporation, payable immediately, in United States gold coin, to the Secretary, at the office of the Company, No. 414 California street, San Francisco, California. Any stock upon which this assessment shall remain unpaid on the 31st day of June, 1873, will be delinquent and advertised for sale at public auction, and unless payment is made before, will be sold on Monday, the 2nd day of July, 1873, to pay the delinquent assessment, together with costs of advertising and expenses of sale. By order of the Board of Directors. R. WEGENER, Secretary. Office, 414 California street, San Francisco, Cal. m29

Great Blue Gravel Range—Location of works, Placer County, State of California.

NOTICE is hereby given, that at a meeting of the Board of Directors of said Company, held on the 14th day of June, 1873, an assessment of Ten (\$10) Dollars per share was levied upon the capital stock of the Corporation, payable immediately, in gold coin of the United States, to the Secretary, at his office, Room 5 and 6, No. 302 Montgomery street, San Francisco, California. Any stock upon which said assessment shall remain unpaid on Monday, the 14th day of July, 1873, shall be deemed delinquent, and will be duly advertised for sale at public auction, and unless payment shall be made before, will be sold on Tuesday, the 5th day of August, 1873, to pay the delinquent assessment, together with costs of advertising and expenses of sale. By order of the Board of Directors. WM. H. WATSON, Secretary. Office, Room 5 and 6, No. 302 Montgomery street, San Francisco, Cal. j14-dss

Hasloe Mill and Mining Company—Location of works, Gentry's Gulch, Mariposa County, Cal. Principal place of business, San Francisco, Cal.

NOTICE is hereby given, that at a meeting of the Board of Directors, held on the 14th day of May, 1873, an assessment of Ten (\$10) Dollars per share was levied upon the capital stock of the Corporation, payable immediately, in U. S. gold and silver coin, to the Secretary, at the office of the Company, Room 14, No. 408 California street, San Francisco, Cal. Any stock upon which this assessment shall remain unpaid on the 28th day of June, 1873, will be delinquent and advertised for sale at public auction, and unless payment is made before, will be sold on the 1st day of July, 1873, to pay the delinquent assessment, together with costs of advertising and expenses of sale.

Heckerdorn Gold and Silver Mining Company—Principal place of business, San Francisco, California. Location of works, Blue Mountain District, Calaveras County, California.

Notice is hereby given, that at a meeting of the Board of Directors, held on the 19th day of June, 1873, an assessment of twenty-five cents per share was levied upon the capital stock of the Corporation, payable immediately in United States gold coin, to the Secretary, at his office, No. 734 Montgomery street, San Francisco, California. Any stock upon which this assessment shall remain unpaid on the 15th day of July, 1873, will be delinquent, and advertised for sale at public auction, and unless payment is made before, will be sold on Tuesday, the 12th day of August, 1873, to pay the delinquent assessment, together with costs of advertising and expenses of sale.

LOUIS TERME, Secretary.
Office, 734 Montgomery street, Room No. 5. Office hours, from 10 to 12 A. M., and from 1 to 3 P. M.

Heckerdorn Gold and Silver Mining Company—Blue Mountain District, Calaveras County, California. ANNUAL MEETING.

At a meeting of the Board of Directors, held on the 25th day of June, 1873, the following resolutions were adopted: M. Louis Terme, President; N. Claude Guillemet, Treasurer; M. Louis Terme, Secretary.

LOUIS TERME, Secretary.
Office, 734 Montgomery street. Office hours, from 10 to 12 A. M., and from 1 to 3 P. M.

Hardy Coal Mining Company—Location of principal place of business, San Francisco, Cal. Notice.—There are delinquent upon the following described stock, on account of assessment levied on the 26th day of March, 1873, the several amounts set opposite the names of the respective shareholders as follows:

Names	No. Certificate	No. Shares	Amount.
Warren Goodale.....	37 (old)	94	\$569.30
Edward McLean.....	1	36	36 00
Edward McLean.....	2	62	62 00
Edward McLean.....	3	41	41 00
Edward McLean.....	16	100	100 00
Edward McLean.....	24	50	50 00
Edward McLean.....	23	50	50 00
Edward McLean.....	24	150	150 00
Edward McLean.....	33	2	2 00
Edward McLean.....	35	4	4 00
Edward McLean.....	46	48	48 00
C S Kildridge.....	35 (old)	4	50 00
F C Lowrey.....	15	12 1/2	12 00
Jacob Hardy.....	10	100	100 00
Jacob Hardy.....	12	10	10 00
Jacob Hardy.....	21	85	85 00
Jacob Hardy.....	31	8 1/2	8 50
Jacob Hardy.....	38	15	15 00
Jacob Hardy.....	40	2	2 00
Jacob Hardy.....	41	8	8 00
Jacob Hardy.....	25 (old)	1	12 50
Jacob Hardy.....	28 (old)	1	12 50
Jacob Hardy.....	39 (old)	1	12 50
M H Eastman.....	28	45	45 00
M H Eastman.....	29	65	65 00
M H Eastman.....	30	50	50 00
Bartlett & Wilcox.....	33 (old)	50	312 50

And in accordance with law, and an order of the Board of Directors, made on the 26th day of March, 1873, so many shares of each parcel of said stock as may be necessary, will be sold at public auction at the company's office, Room 5, No. 338 Montgomery street, San Francisco, Cal., on the 24th day of May, 1873, at the hour of 12 o'clock M., of said day, to pay said delinquent assessment thereon, together with costs of advertising and expenses of sale.

JACOB HARDY, Secretary pro tem.
Office, Room 5, No. 338 Montgomery street, San Francisco, Cal.

POSTPONEMENT—At a meeting of the Board of Directors of the Hardy Coal Mining Company, held Saturday, May 24, 1873, the above sale of delinquent stock was postponed until Saturday, the 7th day of June, 1873, at 12 o'clock M. of that day, at the office of the Company, No. 338 Montgomery street, Room 5, San Francisco, California. All stock on which the assessment is not paid at said time will be sold.

JACOB HARDY, Secretary pro tem.

POSTPONEMENT—At a meeting of the Board of Directors of the Hardy Coal Mining Company, held Saturday, June 7, 1873, the above sale of delinquent stock was postponed until Saturday, the 21st day of June, 1873, at 12 o'clock M. of that day, at the office of the Company, No. 338 Montgomery street, Room 5, San Francisco, California. All stock on which the assessment is not paid at said time will be sold.

JACOB HARDY, Secretary pro tem.

Lady Esten Tunnel and Mining Company—Principal place of business, No. 35 New Merchants' Exchange, San Francisco, California. Location of works, Little Cottonwood District, Utah Territory.

Notice is hereby given, that at a meeting of the Board of Directors, held on the 11th day of June, 1873, an assessment (No. 3) of five cents per share was levied upon the capital stock of the Corporation, payable immediately in United States gold coin, to the Secretary, No. 35 New Merchants' Exchange, San Francisco, Cal. Any stock upon which this assessment shall remain unpaid on the 15th day of July, 1873, will be delinquent, and advertised for sale at public auction, and unless payment is made before, will be sold on Wednesday, the 6th day of August, 1873, to pay the delinquent assessment, together with costs of advertising and expenses of sale.

CHAS. S. HEALY, Secretary.
Office, 35 New Merchants' Exchange, California street, San Francisco, California.

Mazeppa Silver Mining Company—Location of works, Ely Mining District, Lincoln County, State of Nevada. Principal place of business, San Francisco, Cal.

Notice is hereby given, that at a meeting of the Directors, held on the 20th day of May, 1873, an assessment (No. 1) of Fifty Cents per share was levied upon the capital stock of the Corporation, payable immediately in United States gold coin, to the Secretary, at the office of the Company, No. 329 Sansome street, San Francisco, California. Any stock upon which this assessment shall remain unpaid on the 15th day of June, 1873, will be delinquent, and advertised for sale at public auction, and unless payment is made before, will be sold on Tuesday, the 15th day of July, 1873, to pay the delinquent assessment, together with costs of advertising and expenses of sale.

W. F. GAME, Secretary.
Office, No. 329 Sansome street, San Francisco, Cal.

Newton Booth Consolidated Mining Company—Location of principal place of business, San Francisco, California. Location of works, Ely Mining District, Lincoln County, Nevada.

Notice.—There are delinquent upon the following described stock, on account of assessment levied on the seventh day of May, 1873, the several amounts set opposite the names of the respective shareholders as follows:

Names	No. Certificate	No. Shares	Amount.
T Campbell, Trustee.....	14	100	\$50 00
T Campbell, Trustee.....	15	100	50 00
T Campbell, Trustee.....	16	100	50 00
T Campbell, Trustee.....	17	100	50 00
T Campbell, Trustee.....	18	100	50 00
T Campbell, Trustee.....	19	100	50 00
T Campbell, Trustee.....	20	100	50 00
T Campbell, Trustee.....	21	100	50 00
T Campbell, Trustee.....	22	100	50 00
T Campbell, Trustee.....	23	100	50 00
T Campbell, Trustee.....	24	100	50 00
T Campbell, Trustee.....	25	100	50 00
T Campbell, Trustee.....	26	100	50 00
T Campbell, Trustee.....	27	100	50 00
T Campbell, Trustee.....	28	100	50 00
T Campbell, Trustee.....	29	100	50 00
T Campbell, Trustee.....	30	100	50 00
T Campbell, Trustee.....	31	100	50 00
T Campbell, Trustee.....	32	100	50 00
T Campbell, Trustee.....	33	100	50 00

LOUIS TERME, Secretary.
Office, No. 314 California street, San Francisco, Cal.

Names	No. Certificate	No. Shares	Amount.
T Campbell, Trustee.....	38	100	50 00
T Campbell, Trustee.....	39	100	50 00
T Campbell, Trustee.....	40	100	50 00
T Campbell, Trustee.....	41	50	25 00
T Campbell, Trustee.....	42	25	12 50
T Campbell, Trustee.....	43	25	12 50
T Campbell, Trustee.....	44	50	25 00
T Campbell, Trustee.....	45	50	25 00
T Campbell, Trustee.....	46	50	25 00
T Campbell, Trustee.....	47	50	25 00
T Campbell, Trustee.....	48	50	25 00
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T Campbell, Trustee.....	68	100	50 00
T Campbell, Trustee.....	69	100	50 00
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T Campbell, Trustee.....	107	100	50 00
T Campbell, Trustee.....	108	100	50 00
T Campbell, Trustee.....	109	44	22 00
T Campbell, Trustee.....	110	44	22 00
T Campbell, Trustee.....	111	44	22 00
T Campbell, Trustee.....	112	44	22 00
T Campbell, Trustee.....	113	44	22 00
T Campbell, Trustee.....	114	44	22 00
T Campbell, Trustee.....	115	44	22 00
T Campbell, Trustee.....	116	44	22 00
T Campbell, Trustee.....	117	217	108 50
T Campbell, Trustee.....	118	650	325 00
T Campbell, Trustee.....	119	500	250 00
T Campbell, Trustee.....	120	250	125 00
T Campbell, Trustee.....	121	250	125 00
T Campbell, Trustee.....	122	250	125 00
T Campbell, Trustee.....	123	250	125 00
T Campbell, Trustee.....	124	50	25 00
T Campbell, Trustee.....	125	100	50 00
T Campbell, Trustee.....	126	100	50 00
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T Campbell, Trustee.....	136	100	50 00
T Campbell, Trustee.....	137	100	50 00
T Campbell, Trustee.....	138	100	50 00
T Campbell, Trustee.....	139	200	100 00
T Campbell, Trustee.....	140	200	100 00
T Campbell, Trustee.....	141	1500	750 00
T Campbell, Trustee.....	142	141	70 00
T Campbell, Trustee.....	143	141	70 00
T Campbell, Trustee.....	144	500	250 00
T Campbell, Trustee.....	145	100	50 00
T Campbell, Trustee.....	146	100	50 00
T Campbell, Trustee.....	147	100	50 00
T Campbell, Trustee.....	148	100	50 00
T Campbell, Trustee.....	149	100	50 00
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T Campbell, Trustee.....	156	100	50 00
T Campbell, Trustee.....	157	100	50 00
T Campbell, Trustee.....	158	100	50 00
T Campbell, Trustee.....	159	100	50 00
T Campbell, Trustee.....	160	135	67 50
T Campbell, Trustee.....	161	210	105 00
T Campbell, Trustee.....	162	500	250 00
T Campbell, Trustee.....	163	100	50 00
T Campbell, Trustee.....	164	100	50 00
T Campbell, Trustee.....	165	100	50 00
T Campbell, Trustee.....	166	100	50 00
T Campbell, Trustee.....	167	100	50 00
T Campbell, Trustee.....	168	100	50 00
T Campbell, Trustee.....	169	350	175 00
T Campbell, Trustee.....	170	600	300 00
T Campbell, Trustee.....	171	600	300 00
T Campbell, Trustee.....	172	600	300 00
T Campbell, Trustee.....	173	600	300 00
T Campbell, Trustee.....	174	100	50 00
T Campbell, Trustee.....	175	100	50 00
T Campbell, Trustee.....	176	100	50 00
T Campbell, Trustee.....	177	100	50 00
T Campbell, Trustee.....	178	200	100 00
T Campbell, Trustee.....	179	100	50 00
T Campbell, Trustee.....	180	100	50 00
T Campbell, Trustee.....	181	78	39 00
T Campbell, Trustee.....	182	383	191 50
T Campbell, Trustee.....	183	234	117 00
T Campbell, Trustee.....	184	100	50 00
T Campbell, Trustee.....	185	100	50 00
T Campbell, Trustee.....	186	50	25 00
T Campbell, Trustee.....	187	50	25 00
T Campbell, Trustee.....	188	50	25 00
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T Campbell, Trustee.....	196	100	50 00
T Campbell, Trustee.....	197	100	50 00
T Campbell, Trustee.....	198	100	50 00
T Campbell, Trustee.....	199	100	50 00
T Campbell, Trustee.....	200	831	415 50
T Campbell, Trustee.....	201	1287	643 50
T Campbell, Trustee.....	202	192	96 00
T Campbell, Trustee.....	203	100	50 00
T Campbell, Trustee.....	204	100	50 00
T Campbell, Trustee.....	205	100	50 00
T Campbell, Trustee.....	206	50	25 00
T Campbell, Trustee.....	207	50	25 00
T Campbell, Trustee.....	208	209	104 50

And in accordance with law, and an order of the Board of Directors, made on the 7th day of May, 1873, so many shares of each parcel of said stock as may be necessary, will be sold at public auction, at the office of the Company, No. 314 California street, San Francisco, Cal., on the 12th day of July, 1873, at the hour of 1 o'clock P. M., of said day, to pay said delinquent assessment thereon, together with costs of advertising and expenses of sale.

LOUIS TERME, Secretary.

Office, No. 314 California street, San Francisco, Cal.

Mansfield Gold Mining Company—Location of principal place of business, San Francisco, California.

Notice.—There are delinquent upon the following described stock, on account of assessment levied on the 8th day of May, 1873, the several amounts set opposite the names of the respective shareholders as follows:

Names	No. Certificate	No. Shares	Amount.
Naum.....	No. Certificate	No. Shares	Amount.
Naum, H.....	1	100	\$12 50
Naum, H.....	2	100	12 50
Naum, H.....	3	100	12 50
Naum, H.....	4	100	12 50
Naum, H.....	5	100	12 50
Naum, H.....	6	100	12 50
Naum, H.....	7	100	12 50
Naum, H.....	8	100	12 50
Naum, H.....	9	100	12 50
Naum, H.....	10	100	12 50
Naum, H.....	11	100	12 50

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JOSEPH MOORE... Vice-President and Superintendent
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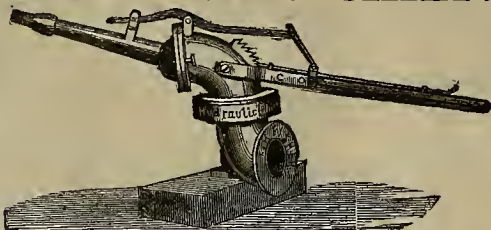
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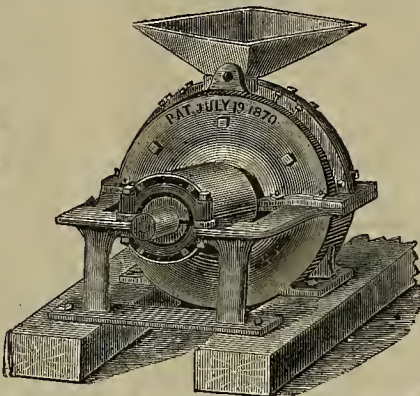
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Every Description of Ornamental Work,
Stove and French Range Work, grate and fender work,
small machines of all descriptions, house
work, etc., promptly attended to.
25v25-3m

SITUATION WANTED.

A Thoroughly Practical and Theoretical
Miner, acquainted with the mining business in all its
branches—Assaying, Amalgamating, Surveying, Etc.—
wishes employment. Best references given.
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GEO. W. PRESCOTT. C. W. SCHEIDEL. W. B. ECKART

PRESCOTT, SCHEIDELL & CO., MARYSVILLE FOUNDRY.

Corner of B and Fourth streets, Marysville, Cal.

MANUFACTURERS OF

STEAM ENGINES,

STATIONARY AND PORTABLE

SAW AND GRIST MILLS,

Hydraulic Machinery,

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Of every description, constantly on hand.

Plans and estimates furnished upon application.
Repairs upon all kinds of Machinery promptly made,
and at moderate charges.

Having unrivalled facilities, we are prepared to make
to order, at short notice, anything required in our line.
Specimens of our work may be seen in all the mining
regions on this coast.

NATIONAL LOCOMOTIVE WORKS.

DAWSON & BAILY,

Connellsville, Penn.,

Manufacture LOCOMOTIVES adapted to
Every Kind of Railway Service.

NARROW GAUGE AND MINE LOCOMO-
TIVES A SPECIALTY.

All work accurately fitted to gauge, and thoroughly
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Photographs of Locomotives can be seen at the
above Number. 12v26tf

OCCIDENTAL FOUNDRY,

137 and 139 First street.....SAN FRANCISCO.

STEIGER & BOLAND,

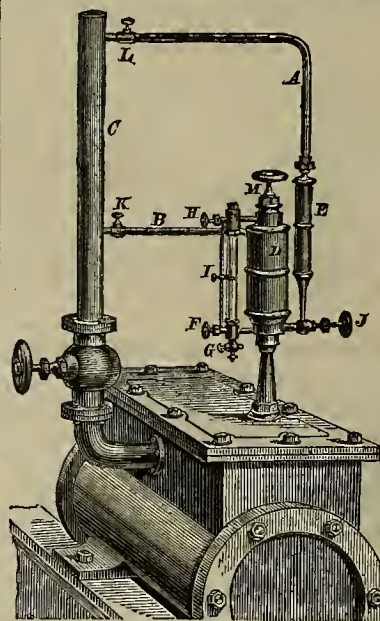
IRON FOUNDERS.

IRON CASTINGS of all descriptions at short notice.
Sole manufacturers of the Hepburn Rolling Pan
and Callahan Grate Bars, suitable for Burning
Screenings.

Notice.—Particular attention paid to making Super-
ior Shoes and Dies. 20v26-3m

Machinery.

N. Seibert's Eureka Lubricators.



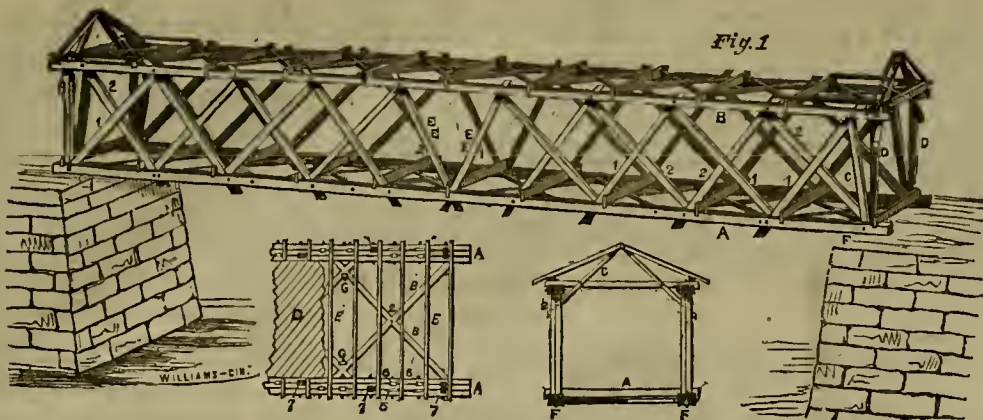
THE HIGHEST PREMIUM

Awarded by the Mechanics' Institute Fair, San Francisco, and State Fair, Sacramento, 1871.

These Lubricators are acknowledged by all engineers to be superior to any they have ever used; feed constantly by pressure of condensed water, supplied by pipe A, regulated under the oil by valve J, and forced out through check valve and pipe B into the steam pipe C; it then becomes greasy steam, passes to all the valves and cylinder of every stroke of the engine; glass tube I indicates amount used per hour. Packing on rods and stems lasts longer, and the rings on the piston will not corrode. One pint of oil will last from three to six days, according to speed and size of engine; I, sliding gauge; K, valve to shut off when engine stops; H, F, valves to shut off in case of frost; steam does not enter the cup; it is always cool; warranted to give satisfaction. Patented February 14, 1871. Manufactured by California Brass Works, 125 First street, S. F. 24v23tf

PUBLISHERS please say advertised in Scientific Press.

PACIFIC BRIDGE COMPANY.



WORKS NEAR SOUTH POINT MILL, BERRY STREET, SAN FRANCISCO, CAL.

Are Prepared, with Superior Machinery, to Manufacture and Build all kinds of Bridges on Smith's, Howe's, and other Improved Plans. Framing of all kinds done by Machinery.

The Smith Bridges have been thoroughly tested in the East for Three Years, and wherever tried have proved superior to any other Bridge in the following points:
Being built of wood entirely, they are not affected by change of temperature.
The timber used is placed so directly in the line of strain, that less material is required to support the same load.
It is not perceptibly affected by shrinkage. It is the most Economical Bridge built. It is adapted to any practicable LENGTH OF SPAN.
Plans, Specifications and Terms will be sent to any County, Township or Person wishing to build a Bridge, and no charge made unless the Plan is used. For all Public Bridges the Plan will always be open to competition.
Smith's celebrated CAST IRON PIER, economical, and adapted to heavy currents, built at low rates.

C. H. GORRILL, Secretary.

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CROCKER'S PATENT
TRIP HAMMER QUARTZ BATTERY.

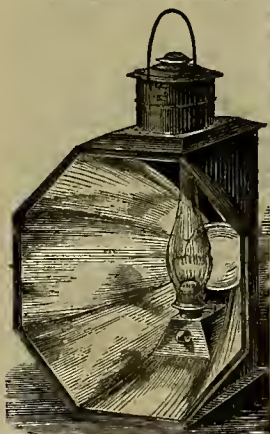


The inventor having perfected and tested the durability and capacity of these Batteries to his entire satisfaction, is now ready to manufacture and guarantee them. Parties in want of a Battery cannot find their equal in regard to PRICE, WEIGHT, CAPACITY, POWER TO RUN THEM.
State and County Rights for Sale by
G. D. CROCKER,
17v26-4f 315 California street, San Francisco.

THEODORE KALLENBERG,
MACHINIST,
and Maker of Models for Inventors. All kinds of Dies
Stamps and Punches made. Also, all kinds of
Small Gears Cut.
Repairing done on very Reasonable Terms and in the
best manner. No. 32 Fremont street, S. F. 19v23-3m

PACIFIC LAMP MANUFACTORY.

EMILE BOSCH,
Patentee and Manufacturer of
LAMPS, LANTERNS AND REFLECTORS.
802 MONTGOMERY STREET, SAN FRANCISCO.

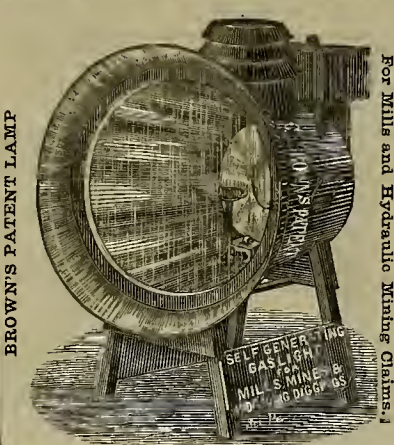


New Mining & Mill Lights.
MANUFACTORY,
N. E. corner Montgomery and Jackson sts.,
San Francisco, Cal.
21v3-cow-3m

J. M. STOCKMAN,
Manufacturer of
PATTERNS AND MODELS,
(Over W. T. Garratt's Brass Foundry).
N. W. corner Natoma and Fremont streets, S. F. En-
trance on Natoma street. 6v23-3m

San Francisco Cordage Company.
Established 1856.
We have just added a large amount of new machinery of
the latest and most improved kind, and are again prepared
to fill orders for Rope of any special lengths and sizes. Con-
stantly on hand a large stock of Manila Rope, all sizes;
Tarred Manila Rope; Hay Rope; Whale Line, etc., etc.
TUBBS & CO.,
17v26-4f 811 and 613 Front street, San Francisco.

BROWN'S PATENT LAMP.



One of these Lamps, when placed at a distance of 200
feet from the bank, will light up a bank surface 250 feet
in length and 150 feet high, and to a much better ad-
vantage than any other light heretofore tried, and at an
expense not to exceed five cents per hour. Lamps
furnished at short notice.

Letter of Recommendation.
Mr. O. B. BROWN-Sir: Your Patent Lamp for light-
ing hydraulic mines, which you sold to me in December
last, has given entire satisfaction, and far exceeds my
expectations, and I think it the best and cheapest light
ever used to light mining claims by night, and am sat-
isfied that I have saved three hundred dollars by the
use of it in the last mining season over pitch or any
other light of the same brilliancy; and I will also say
that if I could not get another lamp, five hundred dol-
lars would not buy it. Yours,
W. D. APLIN.

Little York, Nov. 5, 1872.
For further particulars, address,
fe22-4f C. B. BROWN, Placerville, Cal.

P. J. PHILLIPS & CO., No. 608 Clay street, near
Montgomery, San Francisco, are agents for Brown's
Lamp, where it may be seen.

The California Powder Works

No. 314 CALIFORNIA STREET,
SAN FRANCISCO.
Manufacturers and have constantly on hand
SPORTING,
MINING,
And BLASTING
POWDER,
OF SUPERIOR QUALITY, FRESH FROM THE
MILLS. It being constantly received and transported
into the interior, is delivered to the consumer within a
few days of the time of its manufacture, and is in every
way superior to any other Powder in Market.
We have been awarded successively
Three Gold Medals
By the MECHANICS' INSTITUTE and the STATE AG-
RICULTURAL SOCIETY for the superiority of our
products over all others.
We also call attention to our
HERCULES POWDER.
Which combines all the force of other strong explosive
now in use, and the lifting force of the BEST BLASTING
POWDER, thus making it vastly superior to any other
compound now in use.
A circular containing a full description of this Pow-
der can be obtained on application to our Office.
16v20-3m JOHN F. LOHSE, Secretary.

SEND this paper to your friends ahead.

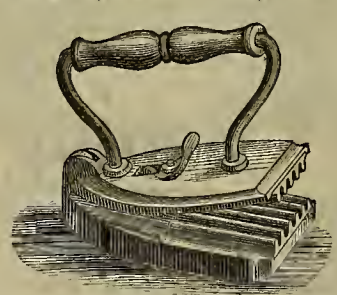
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THE ONLY RELIABLE
STANDARD.

8,000 to 40,000 pounds capacity. Length of
platform to suit purchaser. The same scale is used for
weighing cattle, hogs, etc. Scales adapted to all
branches of business. Address
FAIRBANKS & HUTCHINSON,
537 Market street.
Agents for MILES' ALARM MONEY DRAWERS, a
sure protection against till thieves. 16v26-cowbp6m

Polishing and Fluting Iron.



This new invention takes the place of two articles
needed in nearly every house. As a POLISHING IRON
it has no superior. The part used for Fluting is made
of brass, and highly polished. A Receipt for making
FRENCH GLOSSING STARCH, that gives a superior polish,
goes with each iron. The Polishing Iron and Fluter,
being in one, are both heated at the same time. We are
now prepared to furnish them in quantities to suit.
Price, \$3.

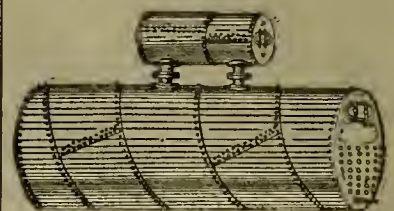
WIESTER & CO.,
17 New Montgomery street, San Francisco,
General Agents for Pacific Coast.

OAKBY & SON'S EMERY AND BLACK
LEAD MILLS, Blackfriars Road, London, England.
OAKBY'S WELLINGTON KNIFE POLISH.
Packets, 3d. each; tins, 6d., 1s., 2s., 6d., and 4s. each.
OAKBY'S INDIA RUBBER KNIFE
BOARDS from 1s. 6d. each.
OAKBY'S SILVERSMITHS' SOAP (NON
MERCURIAL), for Cleansing and Polishing Silver, Elec-
tro-plating, Plate-glass, Marble, etc. Tablets, 6d. each.
OAKBY'S GENUINE EMERY, GRAIN
AND FLOUR.
OAKBY'S EMERY AND GLASS CLOTH.
OAKBY'S CABINET GLASS PAPER,
BLACK LEAD, etc.
OAKBY'S GOODS SOLD EVERYWHERE
by Ironmongers, Grocers, Oilmen, Brushmakers, Drug-
gists, etc. 21v23-1y

SAN FRANCISCO
SCREW BOLT WORKS.

PHELPS BROTHERS, Proprietors
MANUFACTURERS OF ALL KINDS OF
Machine Bolts, Bridge Bolts, and Ship or
Band Bolts.
13, 15 and 17 Drumm Street, San Francisco. 4v24-1y

San Francisco Boiler Works,
123 and 125 Beale Street.....SAN FRANCISCO
F. I. CURRY.
(Late Foreman of the Vulcan Iron Works,) Proprietor.



High and Low Pressure Boilers of all
Descriptions.

SOLE MANUFACTURERS OF THE CELEBRATED
SPIRAL BOILER.
SHEET IRON WORK of every description done
at the Shortest Notice.
All kinds of JOBBING and REPAIRING promptly
attended to. 17v25-3m

McAFEE, SPIERS & CO.,
BOILER MAKERS
AND GENERAL MACHINISTS,
Howard st., between Fremont and Beale, San Francisco.

SHEET IRON PIPE.
THE
Risdon Iron and Locomotive Works

Corner Howard and Beale Streets,
Are prepared to make SHEET IRON AND ASPHALTUM
PIPE, of any size and for any pressure, and contract to
lay the same where wanted, guaranteeing a perfect
working pipe with the least amount of material.
Standard sizes of railroad Car Wheels, with special
patterns for Mining Cars. These small wheels are made
of the best Car Wheel Iron, properly chilled, and can be
fitted up with the improved axle and box-introduced by
this company, and guaranteed to outlast any other
wheels made in this State.
All kinds of Machinery made and repaired.
24v22-3m JOSEPH MOORE, Superintendent.

BLACK DIAMOND FILE WORKS.



G. & H. BARNETT,
Manufacturers of Files of every Description,
Nos. 33, 41 and 43 Richmond street,
Philadelphia, Pa.

MILL SAW FILES A SPECIALTY.
18v25-1y

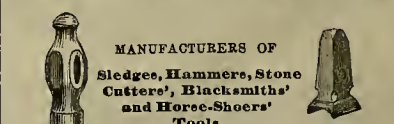
BURLEIGH
ROCK DRILLS
—AND—
Air Compressors.

The Burleigh Rock Drills, which have stood the test
of five years' constant use at the Hoosac Tunnel, and
which are now in use in nearly every State in the Union,
as well as in Europe and South America, are unequalled
in efficiency and economy by any other Drilling Ma-
chine. They are of various sizes, and equally well
adapted to Tunneling, Shifting, Open Cut or Quarry-
ing, and will drill six to ten inches per minute in gran-
ite. They are driven by steam above ground. The Bur-
leigh Air Compressor is the best engine yet devised for
furnishing the "air motor" for the many purposes to
which it is now being used.
They are to be used on the St. Gothard Tunnel, Swit-
zerland; Tunnel 13 miles long. We refer to the follow-
ing gentlemen and works:
Gen. Newton, U. S. A.....Hell Gate Tunnel, L. I.
Mess. Shanley.....Hoosac Tunnel, Mass.
J. Dutton Steele.....Nesquehoning Tunnel, Pa.
Sidney Dillon.....Fourth Avenue Work, N. Y.
Col. Roehling.....East River Bridge Company, N. Y.
For further information, etc., address

L. C. PARKE,
VIRGINIA CITY, NEVADA.
AGENT FOR THE PACIFIC COAST. 415

NELSON & DOBLE,
AGENTS FOR

Thomas Firth & Sons' Cast Steel.



13 and 15 Fremont street, near Market, San Francisco
10v14-4r

Britton, Holbrook & Co., Importers of
Stoves and Metals, Tinners' Goods, Tools and Machines;
111 and 113 California St., 17 and 19 Davis St., San Fran-
cisco, and 178 J St., Sacramento. mr-1y

GENERAL MERCHANDISE.

BAGS.		PAINTS.	
Eng. stand. Wh't	14 1/2	Atlan. W. Lead	11 1/2
Flour Sacks	15 1/2	Whitening	12
Stand. Gunnies	15 1/2	Ohlck	2
" Wool Sacks	55	Paris White	3
" Barley do.	15 1/2	Ohlck	3
Hessian 15-in-gds	10 1/2	Venetian Red	3
" do	10 1/2	Red Lead	3
Burlaps, yard	10 1/2	White Lead	11
CANNED GOODS.		RICE.	
Assorted Fruits	10 1/2	China No. 1	6 1/2
10 1/2 lb cans	00	do	6 1/2
do Table do.	4	Japan	6 1/2
Jams & Jellies	4	Patna	7
Pickles 1/2 gal.	3 1/2	Hawaiian	8
COAL-Jobbing.		SOAP.	
Australian 20-ton	14 1/2	Castle	9 1/2
Goose & Bel. Bay	15 1/2	Local brands	11
St. Louis	15 1/2	do	11
Cumberland, cks.	26 1/2	do	11
do bulk	26 1/2	do	11
Lehigh	20 1/2	do	11
Liverpool	20 1/2	do	11
West Hartley	14 1/2	do	11
Scranton	14 1/2	do	11
Vancouver's 1st 12	14 1/2	do	11
Charcoal	75	do	11
COFFEE.		SUGAR.	
Costa Rica per lb	20	Cal. Cube per lb	11
Guatemala	20	Circle A crushed	11
Java	23	Dry granulated	10 1/2
Manilla	19	Extra	10 1/2
Orizaba	19	Golden	10 1/2
Chico	8	Hawaiian	20
FISH.		Cal. Syrup in bls.	52 1/2
Pac. Dry Cod, new	8	do in kgs.	50
casas	8	do	50
Eastern Cod	8 1/2	do	50
Salmon in bls.	30	do	50
do 2 1/2 cans	25	do	50
do 1 1/2 cans	23	do	50
Pickled Cod bls.	25	do	50
do 1/2 bls.	25	do	50
Cal. Smoked	25	do	50
Herrg. box	50	do	50
MacK. No. 1	14 1/2	do	50
" Extra	14 1/2	do	50
" in kits	25	do	50
mess.	25 1/2	do	50
" ex. mess.	25 1/2	do	50
NAILS.		TEA.	
Assorted size, lb.	5 1/2	Oolong, Canton	19
OILS.		do	19
Pacific Glue Co.	25	do	19
Neat F't No. 1	25	do	19
Castor Oil No. 1	25	do	19
do No. 2	25	do	19
Coccol Nut.	60	do	19
Oliver Plaster	40	do	19
do Possel	45	do	19
Palm	9	do	19
do Barialoil	9	do	19
Lined	105	do	19
China ant in cs.	75	do	19
Sperm, crude	125	do	19
do braced	125	do	19
Coast Whales	40	do	19
Polar, refined	65	do	19
Lard	65	do	19
Refined Fat	65	do	19
Cleopline	37 1/2	do	19
Devos's Bril	45	do	19
Long Island	37 1/2	do	19
Eureka	50	do	19
Downer Kerosene	50	do	19
Gas Light Oil	37 1/2	do	19

San Francisco Metal Market.

WEDNESDAY, June 18, 1873.

IRON.	
Scotch Pig Iron, 10-ton	52 00
White Pig, 10-ton	52 00
Refined Bar, 10-ton	52 00
Refined Bar, good assortment	52 00
Boiler, No. 1 to 4	52 00
Plate, No. 5 to 9	52 00
Sheet, No. 10 to 12	52 00
Sheet, No. 14 to 16	52 00
Sheet, No. 18 to 20	52 00
Sheet, No. 22 to 24	52 00
Sheet, No. 26 to 28	52 00
Sheet, No. 30 to 32	52 00
Sheet, No. 34 to 36	52 00
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Sheet, No. 74 to 76	52 00
Sheet, No. 78 to 80	52 00
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Sheet, No. 86 to 88	52 00
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Leather Market Report.

[Reported for the Press by Dolliver & Bro.]

SAN FRANCISCO, Wednesday, June 18, 1873.

The demand for Domestic Skins and Sole Leather continues light at old prices. The same may be said in reference to French Skins, except that they have an upward tendency.	
City Tanned Leather, 10-ton	26 00
San Francisco Leather, 10-ton	26 00
Stockton Leather, 10-ton	26 00
Jodot, 8 Kil, per doz	50 00
Jodot, 10 to 12 Kil, per doz	50 00
Jodot, second choice, 10 to 12 Kil, per doz	50 00
Levin, 12 and 13 Kil, per doz	50 00
Cornellian, 12 to 16 Kil, per doz	50 00
Cornellian Females, 12 to 13 Kil, per doz	50 00
Cornellian Females, 14 to 16 Kil, per doz	50 00

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SAN FRANCISCO, SATURDAY, JUNE 28, 1873.

VOLUME XXVI.
Number 26.

A Convenient Implement for Hydranlic Miners.

The accompanying illustration is a representation of a recent California invention for collecting the precious metals in mining sluices, and is also a safety pocket and guiding rifle. It is intended as an attachment for sluices, which in combination with a peculiar arrangement of the rifles in the bottom of the sluice will provide a means of arresting and drawing off from the sluice all particles of gold which may reach the bottom before passing the rifles. It is applicable to all classes of sluice mining but its chief value will be found in hydraulic mines. As most of our readers probably know, in that class of mining it is customary to continue the operation of washing for several months before "cleaning up." Meantime little money is obtained, you can't tell whether the ground pays well or not, and a watchman has to be employed to look out for the sluices to prevent them being robbed at night. This invention is intended to arrest some of the gold which would otherwise be caught in the bottom of the sluices and convey it to a receptacle which is under lock and key, and which is attached to the sluice at some convenient point, from which the proper person can in a short time remove the gold caught without interfering with the sluicing operation.

A represents the section of a sluice through which the dirt, gravel, or tailings is carried by the water. The upper part of the sluice through which the dirt first passes, should have a bottom of smooth boulders or cobbles laid closely together and the interstices packed or puddled with clay so as to form a smooth bottom to prevent the lodgment of the gold, while the projecting ends of the cobbles assist in pulverizing the lumps of dirt. Rails can be laid longitudinally to protect the rifles from boulders as now laid in ordinary sluices. At a convenient point the section, A, is placed, the bottom of which is as smooth as possible. One or more rifle bars, B, are laid diagonally across the sluice forming a sort of "track." These rifle bars may be varied in form and be laid in different directions, but the inventor prefers laying them as shown. They consist of a thin narrow plate as a base, extending diagonally from side to side, which has a ridge across its lower edge about 1 inch in height—more or less—which does not cover the base plate at the angles. This track may be amalgamated if desired, but in order to clean it the water would then have to be shut off as in other sluices. The use of the track is to arrest the heavier particles of metal and guide them to a cavity, G, at some point in its length. The cavity, G, connects with the reservoir shown as being attached to the side of the sluice in Figure 1.

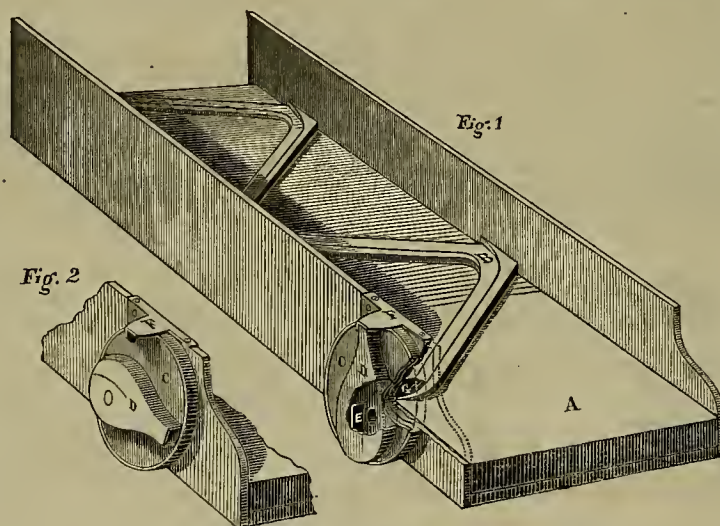
A circular plate or disk, C, is attached to the side of the sluice and the pipe which forms the cavity, G, passes at an angle through the side of the sluice and through the plate, C, as shown. A box, D, is secured against the plate, C, by a bolt which passes through its center so that it can be revolved by hand when desired. The inner face of the box, D, has a hole through it in the proper place to allow the pipe which forms the cavity, G, to communicate with it when the box, D, is in a certain position as shown in Fig. 1; but when the box, D, is revolved in either direction as shown in Fig. 2, communication between the two holes is cut off. A hole is made in the upper rim of the box, D, through which the box can be

charged with mercury or its contents emptied, and a shield, F, is fixed to the side of the sluice to cover this hole when the pipe, G, and the box, D, communicate. When in the latter position the box can be fixed in place by securing it to the side of the sluice with a padlock or other suitable means.

The operation is as follows: The box, D, is charged with mercury until the mercury rises in the tube which forms the recess, G, and stands almost level with the surface of the zig zag plate, B, inside the sluice. The dirt now being passed through the sluice, all the particles of gold which find the bottom before passing the rifles, will be caught on the track and be directed back and forth by the raised edge of the rifle, B, until they arrive at the cavity, G, where the gold sinks by specific gravity, through the mercury into the box, D, while the dirt and debris will float over the mercury and be carried away. In this manner gold accumulates in the box, D, and can be removed

Hydrostatic Weighing Machine.

We saw this week at Linforth, Kellogg & Co.'s, No. 5 Front street, one of Duckham's Patent Hydrostatic Weighing Machines and Dynamometers, an English invention of great utility. The machine is very simple in appearance and construction, though of great power. It is intended to weigh heavy articles during the operation of loading and unloading, but may also be used as a dynamometer, rope or chain tester. It is simply a square iron box, above and below which are heavy iron rings, for attaching to the materials to be weighed and to the crane. A dial plate is on the front of this iron box which indicates the weight from 100 [pounds up to] 100 tons, according to the size of the machine. The external dimensions of a 30 ton machine are only 28 inches x 18 inches x 13 inches. Inside of the iron case, which is filled with oil, is a simple valve, and when the weight is attached to the lower ring



GOLD CATCHING ATTACHMENT FOR SLUICES.

when desired by turning the box, D, upside down so as to empty out the amalgam and quicksilver. This operation does not interrupt the sluicing operation, as the quicksilver on the cavity, G, will remain undisturbed, while the box is being emptied. After straining, the quicksilver can again be replaced. In order to prevent the loss of quicksilver that will be displaced by the accumulation of metal in the box, D, a partition, E, can be used upon one side of which the mercury is held. This partition is of proper height to allow the quicksilver to flow over into the next compartment before it overflows into the sluice. Dr. J. B. Beers, No. 230 Kearny street, who patented this invention through the SCIENTIFIC PRESS Patent Agency, says that the device can also be used to advantage in the beds of streams, and the particles of gold that are annually washed down the river or creeks be caught and saved.

ANTIMONY.—The Silver State says operations have been resumed on the antimony mine, in Bloody Cañon, on which work was suspended a year ago in consequence of some misunderstanding with those to whom the ore was consigned in San Francisco. Joseph Organ & Co., who own and work the mine, shipped a carload of ore to parties in San Francisco, with whom arrangements have been made for the purchase of the ore.

it forces the oil through the small pipe in proportion to the weight, so that the oil presses the index finger in the dial to the proper point.

Machines of this sort will be found very useful in many places. Small sized ones can be used for weighing ore at mills, where there are no scales. The weighing can all be done in one operation, while loading or unloading. They are also valuable to railway companies, merchants, shippers, iron founders, etc. The weight of metal can be ascertained even during manufacture. Cargo and stores for ships can be weighed while hoisting on board. Everybody who deals in merchandise by weight, or is interested in knowing the strength of material or machinery, can by this contrivance ascertain these particulars.

As soon as the goods are lifted, they are weighed, and the operation of weighing is costless. Several sizes are made for different uses. When attached to the chain of a crane the process of raising the material weighs it accurately. A peculiar merit is its lightness, an 84-lb. machine being capable of weighing ten tons. It is one of the most recent and useful adaptations of the principles of hydraulics, and is like a common spring-balance on a large scale. "Land-lubbers" will readily understand about "weighing the anchor," after seeing this machine, for the operation would be as simple as weighing a pound of sugar, if it were necessary.

The Canadian Pacific Railroad Survey.

We had the pleasure of a call, a few days since, from Mr. Marcus Smith, the engineer in charge of the Western Division of the Canadian Pacific Railroad, extending from Fort Edmonton, near the Eastern base of the Rocky Mountains, to its terminus on Puget Sound—about one thousand miles in extent, and comprising all the difficult engineering points on the line of the road.

Mr. Smith was returning to his field of labor, after having visited the Canadian Capital, to make a report of the progress thus far upon the work. In addition to the main trunk, the survey embraces two branches,—one to the north, 120 miles to Bute Inlet; the other, to the south, by way of Fraser River to Burrard's Inlet. The engineering difficulties over the Rocky mountains, are much lighter than was apprehended. The highest elevation is found in the Yellow Head Pass, 3,800 feet above the sea level, which is reached by a grade of 300 miles, the maximum of which is 52 feet per mile, and that not covering more than one-tenth of the distance. Three or four short tunnels will be required, but a little over a mile in length, altogether.

The work over the Cascade Range is heavier and more difficult. The best line yet found requires about fourteen miles of grade, 100 to the mile, including much rock cutting and some four miles of tunnel. Mr. Smith will look for a better route over the Cascades. Less difficulty is anticipated from snow than is met with on the Union Pacific. We are assured that there is no truth in the reports heretofore circulated with regard to the letting of contracts for grading, etc.; but it is the intention to commence active operations this season.

There seems to be a very erroneous idea abroad with regard to the agricultural capacities of the country to be traversed by this road, East of the Rocky Mountains. Instead of its being a barren, desolate region, it is, if anything, superior to the great plains near the same meridian traversed by the Union Pacific, and contains as large if not a larger area of cultivable land, with a climate in no way inferior. We are assured that the region traversed by this road is capable of sustaining fully twenty-five millions of population.

SERIOUS MINING ACCIDENT.—Two miners named John George and George Dobbs were precipitated 224 feet down a shaft in the Eureka Consolidated mine this week. George was killed, and Dobbs, who had both legs and arms broken, will not recover. They got on the cage and the brake gave way letting the whole thing fall. We do not know whether there was any safety catch on this cage or not—probably not—but with all the safety appliances for preventing such accidents there are in use, it is a piece of gross carelessness to put up a cage and run it without them. It was only a few weeks since that the rope broke which hoisted the cage in another mine, in Nevada, but the safety catch held it in place, thereby saving the lives of three men who were at the bottom of the incline. If superintendents will run cages without safety catches the miners ought to protest against them.

TWENTY CONCENTRATORS.—The Keystone Mill, in Amador, in which two of Joshua Hendy's ore concentrators have been in use for two years, will hereafter run twenty new machines; sixteen for the batteries and four for concentrating, following the settlers. The blanket process will now be given up in this mill.

We are without our usual Virginia City letter this week, owing to illness of our correspondent.

CORRESPONDENCE.

Notes of Travel in Tuolumne and Calaveras Counties.

[By our Traveling Correspondent.]

THE GOLDEN GATE QUARTZ M. Co.'s
Works are located about 1 1/4 miles southeast of Sonora. This mine was the original location of W. G. Long, Esq., now owned by J. Hatch, M. L. Thomson, L. A. Rider and Messrs. Brown and McKay, all of Benicia, Cal., and W. G. Long of Sonora and J. H. Holt of San Francisco. This company claim a ledge 2,650 feet in length, running nearly northeast and southwest. It is being rapidly developed by both a tunnel and shaft, the latter is in 250 feet, and the former down 60 feet.

THE WIDTH OF THE LEDGE

At the bottom of the shaft is not really known, but at this writing they have a width of 7 feet of ore in the shaft, and are only on the foot wall, all of which contains more or less gold, and some of it fabulously rich. A prospect of some 5 pounds of rock, taken from different parts of this ledge, prospected \$375 per ton in free gold, obtained by crushing in an ordinary mortar. This company's ledge runs from 15 to 50 feet thick, and a prospect is obtainable from any part of it. This mine is favorably located for fall and drainage. A contract is now let to put up

A TEN-STAMP MILL

With capacity for 40 stamps; the mill is expected to be completed within 90 days, by which time they will have at least 1,000 tons of ore out ready for crushing. W. G. Long is the Superintendent, now working 6 men.

CASSINELLA MILL.

This flouing mill is located on Mormon Creek, one mile south of Springfield, Tuolumne county and about four miles from Sonora—the county seat. It is owned by Messrs. Paddison & Cassinella. This mill is run by water-power, one run of burrs, and a capacity of making thirty-five barrels of flour every twenty-four hours.

GOLD SPRING COTTAGE

Is a way-side inn kept by L. A. Stevens, and located midway between Jamestown and Sonora, teamsters' headquarters.

THE STICKLE QUARTZ MINING COMPANY,
Is an incorporation with a capital stock of \$100,000 in 10,000 shares. E. J. Wilson is President, E. Wheaton, Secretary, and H. Shipman, Superintendent. This company's works and mine are located within the town limits of Angel's Camp, Calaveras county, this State. Their improvements consist of a

TWENTY-STAMP MILL,

Ruphy steam, there are also fine hoisting works erected over their principal shaft, which is in close proximity to the mill. The mill of this company is very complete, from rock-breakers to concentrators. The ledge of this mine runs northeast by southwest, and is 400 feet in length, the ledge stands nearly vertical, is developed to a depth of 330 feet, by a shaft with three compartments and still sinking. The walls are about 20 feet apart, both of which are composed of elate. The ore body is found in kidney shaped masses between the walls, and has paid as high as \$6.00 or \$7.00 per ton; it is low grade but easily extracted, and readily reduced, so much so that \$4.00-rock would pay a profit. This mill is at present idle, while the mine is being prospected to a greater depth; working 16 men.

LOYD GRAVEL MINE,

Located in the town of San Andreas, Calaveras county, is owned by the Lloyd Bros., merchants of San Andreas. This claim is an ancient channel, and is being mined by drifting. The Lloyd Bros. claim a little over 3,000 feet of this channel, which runs from 100 to 400 feet wide and averages 150 feet. The pay streak is a cemented gravel and from two to four feet thick. A little over two-fifths of this claim has been drifted out. This claim is being worked by hoisting works run by water, through a shaft 44 feet deep, working an average of ten men. They own a 5-stamp battery run by the same power working their hoisting works—by which for a time all their gravel was crushed; they now run their cement through an arastra as a more economical way of working their pay gravel. The stamps in the mean time are used to crush custom rock. This company are extracting about 12 tons of gravel per day, with the above mentioned force employed. It pays about \$3.50 per ton.

PIONEER CHIEF QUARTZ MINE,

Located about two miles in a westerly direction from the town of San Andreas. It consists of a ledge 3,000 ft. in length, covered by a U. S. Patent, and is the property of A. G. and Benjamin Thorn of San Andreas. The ledge runs nearly north and south, and pitches easterly at an angle of 72°. It is of the character of the great gouge belt of this and adjoining counties, and undoubtedly on the

MORMON LONE

Of the State. The character of the rock of this mine is similar in ever respect to the Hayward mine of Amador County. This claim is being developed by three shafts, down from 45 to 300 feet deep and pierce the lode and

follow the same at intervals of 266 feet. The ore body of this mine is about 4 feet thick and the vein matter between the walls fully 8 feet. The foot wall is a kind of green stone, and the hanging wall of a black slate. This mine has been worked to its present depth by an ordinary whim, but cannot be driven deeper without

HOISTING WORKS,

Which the Messrs. Thorn anticipate erecting including a 10 or 12 stamp mill, if capital expected comes to their aid. The ore of this mine prospects from \$7.50 to \$15 per ton, about 500 tons of which rock is now on the dumps. There is plenty of timber in close proximity to the mine, and water can be had as a motive power, from Treat & Co.'s ditch; the showing of the partially developed mines I visited in this county indicate to me that capital would find a good investment and its presence he attended with beneficial results.

THE NEW YORK MINE

Is about two miles west of San Andreas, Calaveras county, and about one mile south of the Hudson mine, on the south fork of the San Antonio creek. This mine is the property of Peter Davis, Esq., of San Andreas, and consists of an original location 2,000 feet in length running north and south, and pitching to the east. This location has been prospected the entire length of it, which crops out all the way.

It has been developed by a vertical shaft to a depth of 30 feet, the ledge at this point, and in fact all the way down, is between slate walls and shows a ledge of four feet in thickness, and prospects from \$7 to \$15 per ton.

There is about 60 tons of this class of ore now on the dump. This location is as fine as one could wish for, wood, water and fall. One and one-half miles of ditch would bring a plenty of free water to run a 10-stamp mill the year round, and an abundance for 20 stamps at least half the year. Should Mr. Davis succeed in soliciting capital to his aid, my opinion is he has a fortune in this mine.

WORTH'S HILL HYDRAULIC M. Co.

Is an incorporation with a capital stock of \$300,000. S. L. Prindle is President and J. V. Martin, Secretary. The works of this company are located on Chile Gulch, one mile below Chile Gulch Junction, and about six miles south of Mokelumne Hill, Calaveras Co. This corporation own 43 acres of an ancient channel or river bed. Mr. J. V. Martin, Esq., is the general Supt. Some years since its former owners drifted a large portion of this ground out, but only took the richest spots. The present corporation have run a bed-rock flume under the same some 700 feet in length, entering the claim 14 feet below the bed-rock, and some 104 feet from the surface. This company have in connection with their claim 1,400 feet of bed-rock flume. Since opening this mine as a hydraulic claim no general clean up has been made; only cleaning up the closest rifles, enough is known to prove it a splendid paying enterprise. Working regularly 7 men. This company are using one of Hoskin's

LITTLE GIANT NOZZLES.

The water is brought in 3,100 feet of 11-inch pipe, using 200 inches of water under a 220-foot pressure. The grade of this companies flume is 9 inches to every 12 foot box.

LONE STAR MINE

Is on the North Fork of the Mokelumne River in West Point District and distant 3 miles North West from the town of West Point, in Calaveras County, is owned by Messrs Reed & Mauley, of West Point. This is an original location 2,000 feet in length, running nearly North and South, and pitching to the Westward, and the ledge runs from 1 to 8 feet thick.

This mine is very favorably located for working, being on a steep hillside; it is being developed by

THREE TUNNELS,

Number 1 of which is in 200 feet, No. 2, is in 180 and No. 3, is in 250 feet, showing average vein of over 2 feet in thickness; 2 shafts have been sunk upon the same and now sinking another; 33 tons of rock crushed from this mine, taken from tunnel No. 3, averaged \$36 per ton, taking the rock as it comes out. Selected rock from the same mine, has run as high as \$92 per ton.

THE REED & HILLARY MINE,

Is only 150 feet distant from the Lone Star, and is a parallel ledge. The location is 1,000 feet in extent, and is owned by the same parties as in the above mentioned mine. The Reed & Hillary is developed by two tunnels, No. 1 of which is in 150 feet, and No. 2 is in 260 feet, with a shaft sunk to No. 2, 112 feet in depth. The ore body of the mine is similar to the above mentioned, except that the ledge is larger and highly sulphuretted, which is not the case in the other. The ore of this mine will pay as well as the Lone Star, but not by the ordinary process. All of the ore of the above mentioned mines that is reduced, has to be packed on mules about a half mile up a steep hill, and then hauled two miles to mill, costing an average of \$10 per ton to haul and mill it. The water power obtainable here is a prominent feature, having all the water that a dozen mills would need at one time, and perfectly free. So much water passes down this stream in the winter, and confined to so narrow a gorge that the strongest dams are often washed away.

THE WOLVERINE M. & M. Co.

Is an incorporation of \$2,000,000 capital stock, in 20,000 shares, Wm. H. Taylor, President; S.

O. Putnam, Secretary, and H. H. Sheldon, Superintendent. The works and mine are located about three miles northwest from Railroad Flat, in Calaveras County, and twelve miles east of Mokelumne Hill. This company, by purchase and location, own a series of ledges 2,200 feet in extent. This mine at present writing is being developed by one principal incline shaft, now down 300 feet on the incline of the ledge, at which point the ledge averages three and a half feet thick. Above the 200-foot level it is about two and a half feet thick, and at some points below that level it runs to six feet in thickness.

The previous development of this mine was by another incline shaft, sunk to a depth of ninety feet, and a tunnel that was run in on the ledge, 208 feet, cutting what is known in this mine as their south chimney. This company run their

HOISTING WORKS

By a thirty-five horse-power steam engine; the same engine also runs their mill, which is of ten stamps, and has a capacity of 16 tons every twenty-four hours. The rock now being extracted is from between the 200 and 300 foot levels, the pay of which averages about \$20 per ton, running from \$18 to \$27 per ton. Last month this company crushed 228 tons of ore, which yielded \$5,080, netting a dividend of about \$2,000 to the corporation. They employ in all departments some forty men.

Capitalists and tourists wishing to visit any of the above mentioned mines in Calaveras county will find the shortest and most pleasant route by the Mokelumne daily stage line. Stages leave Mokelumne station, on the arrival of the 1:30 p. m., train of the Western Pacific Railroad, every day (Sundays excepted), passing through the following towns: Lockford, Camanche, Campo Seco, Poland House, Lancha Plana, Gwin Mine and Mokelumne Hill. They leave Mokelumne Hill at 6 a. m., connecting with the cars of the Western Pacific Railroad for Stockton, Sacramento and San Francisco. Passengers leaving San Francisco on the Western Pacific 8 a. m. train, arrive at Mokelumne Hill at 7:15 p. m.

L. P. MC.

Discovery of Yosemite Valley.

[Written for the PRESS.]

Now that the fame of Yosemite Valley has become world wide, incidents connected with its discovery and early exploration have a general, if not a special interest. A narrative, however, penned so long after the occurrence, lacks that freshness essential in rendering it readable. It is offered more as a matter of history concerning the valley; as such, will claim to the fullest extent the charitable consideration of its readers. The writer regrets his inability to recall the names of a number composing the party spoken of. Should this come under the eye of any one able to furnish the information they will confer a favor by directing a line to the address of the writer.

Early in August, 1855, when the fervid heat of summer and parching rays of old Sol had dried up the waters in the gulches, baked and hardened the ground so that mining was neither pleasant or profitable, a proposition was made to have a season's hunting, and at the same time determine the truth of the Indian's story of the existence of a wonderful place, *muncho leguas*, (many miles or leagues) back in the mountains where there was "mucho oro," (much gold) and *matos indios*, (bad Indians). The party that started from the head of Sherlock's Creek was composed of ten as fearless spirits and noble hearted fellows as ever shouldered a rifle, or gathered around a campfire. As it was to be a hunting and exploring trip, we limited our supplies to what could be packed upon two animals in addition to our blankets and cooking utensils, with but one pan, pick and shovel. Each member of the party carrying a gun, pistol or knife, with ammunition enough for meeting all contingencies. Our first camp was made near a small stream some twenty miles from Mariposa. It was early, in order that our hunters should have time for providing a deer for supper. No sooner had the fires been started and kettle on to boil than an Aborigine put in his appearance, followed soon after by others; all having little willow bowls or baskets containing something which those of our party were of scent and taste, discovered to be a most delicious beverage, resembling the richest cider from mixed tart and sweet apples. An immediate demand for the article sprang up; and, to supply it, the Indians hurried away, returning soon, however, reinforced in numbers and with liberal supplies of the now famous liquid, which was soon exhausted by our thirsty company.

After a number of hearty draughts, the writer and another member of the party shouldered their guns and started forth in quest of game. In our circuit we came upon the ranchero or camp of our cider merchants, where, squatted around a pile of manzanita berries, were some fifteen or twenty old cronies with eight or ten naked peepoese rolling on end in the heap, their jaws and hands working away for deer life, as fast as their mouths could be filled with berries, chewed and emptied into the large water-tight baskets beside them and from which the juice was dipped out into the small baskets and hurried to market. Shades of imbibers! Could it be possible that this is the delectable drink over which we had smoked our lips so short a time before? Was there a chance for a doubt? Not a word for our eyes and ears, by living their cautious and inactive operation. Bute cider making fully demonstrated. Returning to our camp, some time after, a lively trade was still in progress—the little willow bowls were being emptied by our yet thirsty crowd as fast as brought—the gloom of night finally ending the traffic.

The ignorance oftentimes is bias, was proven here by the perfect satisfaction manifested by those who had partaken most freely, and were filled to repletion. That the peridy of man should lead him to destroy these pleasing illusions is scarcely to be credited. It had been agreed upon by the initiated that *muncho* was to be the word—nothing said about the discovery until the victims not only satisfied their present appetites, but provided for future indulgence, by filling their cautious es had been suggested. The thing, however, was too good to keep long. Pipes had no sooner been lighted and all gathered around the camp fire after our supper of flapjacks and bacon than the revelation of what we knew of Indian cider was made. That group—what splendid subjects for the pencil of a Hogarth, or pen of a Dickens—like quivering waters lashed to foam, by the swirl of a sudden wind came the knowledge. Ineffable dis-

gust seized upon them, and that portion of the system credited with receiving ailment for sustaining it proved recreant; hurried exit were made into the surrounding shades, and the blue vault of the summer sky echoing to a Neptune chorus—"Oh, ah, ugh, hue, hue, hue, hoine, hoine, oo, hul, hul—*shall die*."

Bright and early next morning our Indian merchants appeared in full force, well supplied and ready for business. That noble Dame who, the night before had smiled upon them, now turned her back. Their hopes of fortune in sugar and tobacco were dashed to earth. In fact, had not wise council prevailed, they would have made a departure, not only from our camp, but the scene that had known them through many a season of elder making.

Our second day's journey carried us over a high ridge that divides the south fork of the Merced from the waters running into and forming the Fresno and Chowchilla. After descending the mountain to the south fork, we crossed, following it down on the right hand bank until we came to a favorable place, we camped, intending to have some sport at fishing, the stream being alive with the finest speckled trout. Strange to say, they would not take the hook—we were as wary and shy as if the stream had been whipped by a thousand augers. The result of the afternoon's fishing was most unsatisfactory for hungry men. And, although our minds had been made up for a bountiful supper, we were forced to content ourselves on a square meal of anticipation and a small fish for each. The opinion expressed by one of the party, (a Kentuckian), "that he allowed we didn't understand 'em," was concurred in without dissenting voice.

The third day we continued down the stream some distance from our camping ground where the trail turned to the right and led out of the valley, up the side of the mountain, south of the main Merced. It was a terrible path for each animal, crossing deep and precipitous ravines on fallen trees, and around ledges where there was scarce foothold for a goat. Indian trails are made oftener with reference to direction rather than ease and convenience for traveling. We were continually reminded of this in the day's journey. Circling around and crossing the numerous gulches that furrow the side of the slope below the summit of the main ridge and hence into the great canon below, we were obliged, fatiguing in the extreme. We were obliged to follow the trail, not knowing the country, and fearing if we left it we would lose the animals that carried the supplies and bedding. The Aborigine is generally regarded as superior to his white brother in selecting the most feasible routes and easiest passes, but experience proves the contrary. The miner or mountaineer et once improves upon trails traveled by the Indians, as one and all will testify who clambered long through a black-neck path of early days, and now gallop over the road into the Yosemite.

About the middle of the afternoon we came to the point where the trail led over the brink and commenced its downward course to the valley. Here, as if by common consent, a halt was made, and long and earnestly we gazed, leaning our eyes upon the beautiful scenery before, below and around us, until a wild "Eureka!" rang forth from ten lusty throats upon the still air of that mountain top. An inspiration filled each breast—a grand rejoicing that we were there, and for what was yet in store.

Far, far, down through the hazy ether the sheen of the silver thread of water that wound through and around the narrow strip of emerald could be seen, the whole scene wider than one's palm. The glistening granite walls and towering battlements, the tiny rivers whose waters, leaping from the cliffs, were caught by each passing breeze and wafted in dewdrops to the valley below.

Sliding, rolling, tumbling, on we went, until it seemed as if there was no bottom. At last we reached and crossed the river to its left hand bank, flowing it up until, nearly at the foot of what is now known as the Yosemite Falls, we camped; the location offering fine grazing for our tired mules, as well as wood and water for our own convenience. Early next day we were on the *qui vive* for explorations and sight seeing. Two of the party most fatigued were detailed to guard camp, while the others were making explorations and came to the other side of the mountain at its left hand corner of the valley. Those going up the left hand fork came upon Mirror Lake, Iron Spring, etc. Pushing on, up the canon some distance, the writer, among others, took the right hand main fork, following it to Vernal Fall, where the perpendicular walls barred farther progress. Returning to near the mouth of a creek coming down from the south side of the valley, we were the survey of the situation, and concluded that there was a possibility of going farther up the canon, along the side of the mountain we could reach the top of the cliff. After a hazardous scramble over and under jagged and broken masses of rock, we succeeded, coming out upon the ledge where there was a clump of small pines, and a few feet above where the smoother granite ran down to the water's edge, as it leaped into the abyss. That first view of the mountain side, as it burst upon us, as we raised our heads above the ruins of rock can not be described, and can never be forgotten. It was so entirely unexpected—so utterly different from what we had looked for, that we were spell-bound—completely overwhelmed with awe. We there stood motionless and mute. The first of civilized men to view nature's wildest wood modeled by the Creator's hand from rugged mountain sides.

Above the fall we amused ourselves in drifting wood into the rapid current to see it carried over, endeavored to throw stones beyond the influence of the draft caused by the falling waters, leaned against the stony bulwark on the edge of the precipice and gazed into the depths, where the boiling surging waters sent up clouds of spray, whom we outlined the brightest arches of heaven. The wavering, humid grass plat at the caldron's side, all were enjoyed.

Before returning to camp, a rough outline was sketched of the prominent features of the landscape, which sketch is now most highly prized by the writer, as the first ever made of any portion of this now so much pictured scenery. At camp, where all the company had arrived before us, and where a general review of the day's doings were entered into, much was learned. Upon the declaration that a way around Vernal Fall had been found, that still another valley and falls, even higher than the Vernal existed, the anxiety to see them was such that, although it had been determined to start homeward on the morrow, it was put off for another day. We would gladly have postponed our return to camp, but our provisions were so low, and our hunting and fishing had not been successful. We were on rations of one small jack and a cup of coffee per meal. That the stomach has ruled from Adam's day to the present hour can not be denied, or that poetry dwells not with famine, mentality can not overcome the physical requirements of a mountain trip, though surrounded by the grandeur of Yosemite.

With the writer as guide, the starting point started next day soon after dawn for the upper valley, passing above the Vernal Falls, where we entered into the same amusements as the day before, of throwing stones, driving logs over the falls, carving our names in the rocks, etc. We then extended our explorations farther up the stream, following its bank or edge for some distance on the left side, and then on the right side, passing through a rough and woody canon, at the base of Liberty Cap. We came out above the Nevada or Apron Falls, as we named them. Above these falls, upon a bench of smoother granite, we found a number of large boulders which we rolled over the brink. A huge one was started by a few blows of a pick at its lower side, as the mass sprang over the precipice and went crashing and thundering into the valley, cutting its way through the for-

est trees, as if they had been straws, a sense of fear came upon us, for might there not be hundreds of such rocks ready to start on their journey of destruction? That our experience might be complete, clouds gathered around the mountain tops and poured out floods of rain. Vivid lightnings sprang from peak to peak, peals of thunder shook the earth and rang from cliff and battlement in continuous echoes.

The note of return was sounded on the following morning, but before leaving the valley, the bark was cut from the side of an immense pitch pine, standing at the lower or west end, near the trail, as it rose over the brow of hill after crossing the river; upon the white trunk we wrote our declaration of claiming the valley, signing our names, which, as recollected, were the three brothers, Mann, of Kentucky, Dickerman, of Chicago, the writer, and five whose names are not remembered.

South Vallejo, May 10, 1873.

G. L. PEARSON.

SCIENTIFIC PROGRESS.

Action, Reaction and Contact.

The expression "action and reaction are equal," is one quite commonly used, and we believe that most who use it very imperfectly comprehend its meaning. It is stated in some works on physics, that this follows as a necessary consequence of the inertia of matter, but we have shown, in a former article, that the term inertia had its origin in erroneous ideas; and the terms "action and reaction" are also old, and were determined from equally false conceptions of the true nature of moving matter.

It once supposed when one body approached another that contact was possible between the two. Molecular physics, however, teaches us that actual contact of two bodies can never take place. Ultimate particles, if there be ultimate particles, never touch each other. The compressibility of matter proves this, and it is now admitted, by those who believe in the molecular state of masses, that the molecules of matter exist in a state of vibration or motion, the exact nature of which has never been determined. If, by external pressure, any of the particles be made to change their position, relatively to other particles of the mass, the other particles make, as it were, an effort to restore the normal relation of position. The same is true when one body approaches another. As soon as the particles of one mass have reached a certain limit of distance from the particles of the other mass, the passage of this limit is a signal, so to speak, for the nearest particles of the second to recede. In so doing they approach nearer the adjacent particles, which, in their turn, recede, and so on, until all recede, and the mass moves, as a mass, away from the other body.

So far as the direct perception of the sense can discover, these masses collide, and one appears to strike the other, but to accept this as the true explanation of impact, would be to deny the only inference that can be drawn from the compressibility of matter in masses, and from other considerations. The attraction of gravitation is held to act upon bodies of matter inversely as the squares of the distance between their centers. It is evident, therefore, that if two molecules should ever come into actual contact, they would be held together by a bond of infinite strength, so that they could not be separated by anything less than infinite power. One body cannot, therefore, be said to act upon another, in the original sense in which the term was employed. If we accept the doctrine of an invisible, imponderable, and highly elastic ether, as the medium through which motion is imparted (and this theory is now maintained by the most eminent scientists), then it is absolutely certain that the bodies at their nearest approach to each other must be separated by a film of this ether. If we do not accept this theory, all that we can say is, that when one body approaches another body sufficiently close, the second body coincidentally recedes, and whether we call this phenomenon by the name of repulsion, or by any other name, there certainly is no direct action or reaction. Neither have we any warrant for saying there is indirect action. We know nothing but that it is the universal law of nature that the phenomenon should occur under the condition stated.

Suppose it were a law of nature that, if one body moved away from another, the second should itself move away as far as the first moved, so that the recession of one body one foot would cause the separation of the bodies two feet, no one would ever think of applying the terms action and reaction to such a phenomenon as this. Yet they would have as much reason to suppose that the bodies act and react upon each other, as we have under our hypothesis of the molecular state of matter. It appears to us, therefore, much more philosophical and logical, to say that bodies act, under certain conditions, rather than to assert that they act and react upon each other. *American Artizan.*

REFLEX ACTION.—Mr. Darwin, in his new work, relates the following in connection with the subject of reflex action: The conscious wish to perform a reflex action sometimes stops or interrupts its performance, though the proper sensory nerves may be stimulated. For instance, many years ago I laid a small wager with a dozen young men that they would not sneeze if they took snuff, although they all declared they invariably did so. Accordingly they all took a pinch, but from winking much to succeed, not one sneezed, though their eyes watered; and all without exception had to pay

me my wager. Sir H. Holland remarks that attention paid to the act of swallowing interferes with the proper movements; from which it probably follows, at least in part, that some persons find it difficult to swallow a pill.

To Europe in a Balloon.

It is well known to most of our readers that Prof. Wise, the famous aeronaut, has long contemplated a voyage to Europe, in a balloon. The object is not a mere foolhardy attempt to do what no one else has done; but the voyage is taken purely in the aid of science. The Professor expects by the trip to prove the correctness of a long held theory of his, that the entire equatorial atmosphere of the earth moves constantly eastward with the earth's revolution, and at a rate considerably faster than the earth, just as water is thrown forward from a rapidly revolving grindstone. He thinks that a centrifugal force is that generated by which the air current moves forward at the rate of 100 miles an hour, and he proposes to ascend into this current, and be carried along with it. He thinks he can thus cross the ocean in from 60 to 70 hours.

It is stated that Prof. Henry and other distinguished scientists, fully agree with Prof. Wise, and have faith in the result of the proposed voyage, both because it is reasonable, and because in almost in all cases when balloons have reached any considerable altitude they have invariably moved rapidly East. Prof. Wise has made 446 ascensions, and has been swept rapidly to the eastward in fully 96 out of 100 ascents, during which he has reached any considerable altitude.

It is proposed to construct a balloon with a capacity for carrying five tons. The Professor will take with him three other scientific gentlemen—a very large number being anxious to share the honor, and from whom he can take his choice. The "car" will consist of a closed room with glass windows on all sides, and will contain a lime stove capable of furnishing all the warmth with which to make the party comfortable. An excellent apparatus will also furnish light. If the balloon threatens to fall into the water, the aeronauts will descend into a Francis metallic life-boat, which will be carried beneath the car, well provisioned and supplied with oars, and so constructed that it can neither sink or founder. It can be readily cut loose as soon as the drag, which will in such emergency be thrown from the balloon, has sufficiently checked the speed of the air ship to make such a movement safe.

It was expected that the balloon would leave Boston Commons an important feature of the city celebration for the Fourth of July next; but the recent fire there and further loss of two millions of property, has induced a spasm of economy in the city government, which has delayed the trip for the present. It is confidently believed, however, that the money needed—\$3,000—will soon be forthcoming to enable the anxious scientists to start upon their novel and adventurous voyage.

The Motion of Camphor in Water.

Prof. W. Kingdon Clifford, in the *Science Monthly*, presents the following interesting explanation of a well-known phenomenon: "If small pieces of camphor are dropped into water, they will begin to spin round and swim about in a marvelous way. Mr. Tomlinson gave, I believe, the explanation of this. We must observe to begin with, that every liquid has a skin which holds it; you can see that to be true in case of a drop, which looks as if it were held in a bag. But the tension of this skin is greater in some liquids than in others; and it is greater in camphor and water than in pure water. When the camphor is dropped into water, it begins to dissolve and gets surrounded with camphor and water, instead of water. If the fragment of camphor were exactly symmetrical nothing more would happen; the tension would be greater in its immediate neighborhood, but no motion would follow. The camphor, however, is irregular in shape; it dissolves more on one side than the other, and consequently gets pulled about, because the tension of the skin is greater where the camphor is most dissolved. Now, it is probable that this is not nearly so satisfactory an explanation to you as it was to me when I was first told of it; and for this reason: By that time I was already perfectly familiar with the motion of a skin upon the surface of liquids, and I have been taught by means of it to work out problems in capillarity. The explanation was, therefore, a description of the unknown phenomenon which I did not know how to deal with. But to many of you possibly the liquid skin may seem quite as strange and unaccountable as the motion of camphor in water.

HOW WARM SNOW IS.—Last fall, Mr. Spencer, who has a farm near Elk Rapids, Mich., filled a pit in his field with potatoes, covering them only with boards and potato tops. During the night snow fell, and he was unable to cover them with earth, and they remained in this condition till last week, when the covering of snow, potato tops and boards were removed, and the potatoes found to be entirely untouched by the frost. Perhaps the most remarkable fact connected with this is that a coffee-pot half full of water, which was left standing on the ground beside the potato pit, and was covered only with snow to the depth of about one foot, was found to be as free from ice as when placed there last fall.

Intra-Mercurial Planets.

There is just now much speculation as to the existence of one or more planets moving in orbits between Mercury and the sun, and facts bearing on the subject are fast being accumulated. Prof. Kirkwood, of Bloomington, Indiana, in April last sent a communication to the *Chicago Tribune*, in which he endeavored to show that certain recent observations of spots passing over the sun's disk pointed to the existence of a small intra-mercurial planet, having a revolution around the sun of about thirty-five days.

More recently he writes in the same journal that there are other observations which cannot be referred to the same body, and supposes another planet with a revolution of between sixteen and seventeen days.

Observations recorded by experienced observers are quite too numerous to be attributed to any optical deceptions, and seem in fact to indicate the existence of a zone of minor planets, or asteroids within the orbit of Mercury, similar to that known to exist between the orbits of Mars and Jupiter.

As a farther evidence of the existence of one or more bodies as indicated is a disturbing influence in the motion of Mercury, which can only be explained by the existence of such a body or bodies. At a recent meeting of the Manchester, (Eng.) Philosophical Society, a member, Mr. Sidobotham, also a Fellow of the Royal Astronomical Society, referred to certain observations of his own, as long ago as 1849, which point to the same facts. Observations of a similar character have been noted by others in 1802, 1819 and 1847. The increased interest just now manifested, in astronomical research will probably lead to an early and definite solution of this interesting problem.

MECHANICAL PROGRESS.

The Influence of Acid and Zinc on Iron and Steel.

Mr. M. H. Johnson has written a very interesting paper on the effect of acids on the breaking strain and elongation of iron, from which we condense as follows:

The effect of immersion in acid on the breaking strain and elongation of iron wire naturally suggested itself as an interesting subject for inquiry. Accordingly a number of pieces of iron were immersed in hydrochloric acid for one or more hours, and then carefully tested for elongation and breaking strain. The pieces were then heated on a hot plate for several hours, and again tested, with the following general results:

1. That immersion in acid diminishes the breaking strain of iron wire from $\frac{1}{2}$ to 3 per cent., and of steel wire about 4.76 per cent.
2. That immersion in acid appears in some cases to diminish, in others slightly to augment, the elongation of iron wire; and to augment the elongation of steel wire about 30 per cent.

The effect of pyroligneous acid on iron and steel appears to be exactly similar to that of hydrochloric and sulphuric acids, causing it to become more brittle, etc., though the effects are, perhaps, somewhat less intense. As in their case, heat restores the iron to its original toughness.

A piece of galvanized iron of good quality, which, when cold, several times resisted bending to and fro at right angles to itself, was raised to a red heat with such rapidity that only a small portion of the coating of zinc was vaporized. On then attempting to bend it, it broke off sharp, the fracture being sharp and crystalline. When cold, this piece broke with all its former toughness the fracture showing a long fibre. The same piece was then heated till all the coating of zinc was driven off; it was then found impossible to break it. This clearly shows that the iron was not "red short," except when rendered so by the zinc. The same experiments were tried with iron coated with lead and tinned iron, but without the above results. Some kinds of iron do not appear to be rendered "red short" by the zinc.

Possibly the above phenomenon may have some connection with the fact that zinc forms an alloy with iron at a red heat, containing from 2 per cent. to 6 per cent. of iron, and having a melting point which is higher as the proportion of iron is greater, while lead and tin do not alloy with iron at this temperature. But still the iron appears to absorb the liquid zinc in a similar way to that in which it appears to take up acid on the immersion in it, and with similar results.

NARROW-GAUGE PASSENGER CARS, as generally constructed, stand thirteen inches nearer the rail, and have about fifteen inches less overhang at the side; hence the center of gravity is considerably lower than on the standard gauge, making the carrievary steady, and with less oscillating motion than is usually observable upon the wide gauge. The seats, thirty-six to a car, are arranged double on one side and single on the other, with the order reversed midway of the car, to distribute the weight equally.

IMPROVEMENTS IN IRON MANUFACTURE.—Since the improvements made by Siemens, Bessemer, Heaton, Danks and others, in the methods of purification of iron and the manufacture of steel, much ingenuity has been expended in perfecting the various processes, and among others engaged in such experiments is Mr. Parkes, an account of whose investigation appears in the *London Athenaeum*. The peculiar feature of the process devised by this inventor is the purification of iron from sulphur and phosphorus by injecting into it, when melted, compounds of chlorine or fluorine. By melting the wrought iron with carbon, together with some chlorides and alkalis, it is converted into steel. A more recent, and it would appear, more important improvement in the process of steel manufacture, is that which has been brought forward by some French chemists, and which is based on the partial decarbonization of the iron, under the influence of a rich oxide of the metal. This is a method which, it is stated, has been known for some time, but has not been put in practice on account of the deterioration caused by it in the side of the crucible. In the process as now improved, the iron and mineral are placed in metallic molds, and brought to a red heat in special furnaces. The reaction is produced and the melting does not take place until after the transformation. Ingots are thus obtained, melted in the crucibles or in a reverberating furnace.

SUPPOSED EVIDENCE OF MAN IN THE MIOCENE.—Mr. Frank Calvert, an eminent archaeologist communicates an interesting discovery, which he has recently made in beds regarded as Miocene Territory, bones of animals having etching upon them of the figures of other animals. If there is no mistake about the character of the deposit, this discovery would carry back the existence of men upon the earth, to a period immensely more remote than has yet been ascertained by scientific research—to a much earlier date, even, than can be ascribed to the human remains reported to have been found in the deep gravel mines of California—under Table Mountain, etc. The earliest reference of the latter are only to the Pliocene, and it is considered doubtful if they can be referred back even as far as that. The evidence of geological investigation seems to establish the fact that man has existed on the earth for a period infinitely longer than has generally been assigned to him in past centuries.

AMERICAN LOCOMOTIVES are becoming quite popular in Russia, as they are the only locomotives in the world adapted for burning anthracite coal, of which Russia possesses large deposits. Work in the coal mines in Catherine-slaw, in the province of Don, continues very active, and the mines are being worked with much success. The coal which is there produced supplies several lines of railroad in various parts of the empire. Since the completion of the Voronez-Rostov railroad line, they are occupied in transforming the machinery in order to use anthracite for fuel. It is said that Europe does not manufacture locomotives suited for this kind of fuel; they are only made in America.

NEW MATERIAL FOR GAS MANUFACTURE.—Mr. John Sellars, a manufacturing chemist, of Birkenhead (Eng.), has a novel composition of matter for use in the place of coal, cannel, etc., in the manufacture of illuminating gas. The composition consists of a mixture of seaweed, sea-grass, sea-rack, or the like, with coal-tar, pitch, bitumen, mineral, oils, etc., either with or without peat, charcoal, or other carbonaceous matter, which mixed matter is subjected to destructive distillation in retorts. The advantages claimed are more effective separation of the light hydro-carbons; second, increased yield of carburetted hydrogen, and the production of coke particularly valuable in the manufacture of metal-foundries' blacking.

THE HARDENING OF SWORDS in Solingen is done in the following manner. The swords are placed in a coke fire, with tynes below, and are heated to a uniform cherry red. Before cooling the edges are drawn through wet coal dust, whereupon the whole sword, the strong end first, is dipped into water and quickly withdrawn. When five swords have thus been treated, another man anneals them until they appear blue, testing them also in a clamp for their elasticity. Finally they are annealed gray. The interior thus remains soft, while the exterior becomes hard.

IRON VESSELS, for the transport of spirits, are found to be free from many of the defects of wooden ones, especially such as canse loss. They are made of sheets less than one-tenth of an inch thick, of cylindrical form, about forty-seven inches long and thirty-two inches in diameter, with ends slightly convex. The bung is closed by rubber disks, and protected by wooden hoops on each side; there are thin iron hoops around each end, and the interior is protected from rusting by a coating of gum or dextrine.

DECARBONIZATION OF IRON.—Fenner's process has recently received encomiums from high authorities. Plates of cast-iron, varying from one-half to three-quarters of an inch in thickness are packed in sand, enclosed in chests, and heated for the space of several weeks to a red heat, arrangements being made to ensure a free circulation of air; a fusible slag is formed from the impurities, and is removed without difficulty.

Name of Co.	Location.	Sec. or Cashier.	Office in S. F.	Amount.	Payable.
Bank of California.	S. F.	W. C. Ralston, Cbr.	Cor. Cal. & Sanson.	1 per cent.	May 15
California Theater Co.	S. F.	Z. Crowell, Sec.	318 California st.	3 per cent.	April 15
California Insurance Co.	S. F.		Bush near Kearny st.	1 per cent.	May 1
First National Bank of S. F.	S. F.	N. K. Mastick, Cbr.	N. 1st & Sanson.	2 1/2 per cent.	April 15
Merchants' Exchange Bank of S. F.	S. F.	R. N. Van Brunt, Cbr.	415 Cal. st.	1 per cent.	May 10
Merchants' Exchange Ass'n.	S. F.	A. F. Coldridge, Sec.	2 Merchants' Ex.	1 1/2 per cent.	Mar. 16
Montgomery Bank & Trust Co.	S. F.	D. D. Thompson, Cbr.	4th & Mission	1 per cent.	Mar. 16
North Beach & Mission R. R. Co.	S. F.		Fourth & Lonia st.	1/2 per cent.	April 1
Spring Valley Water Works.	S. F.	E. M. Miles, Sec.	Fourth & Lonia st.	1 per cent.	Mar. 10
	S. F.	C. D. Haven, Sec.	416 & 418 California et.	3 per cent.	April 1

Our Weekly Stock Review.

THURSDAY EVE, June 26, 1873.

Stocks have not been very lively this week and but little business has been done. The advances and declines have been small, and the sales light. The San Francisco Stock Board will celebrate our National Anniversary by a week's holiday, which would not be done if business was lively. The Board will adjourn next Wednesday until the following Tuesday morning.

The Comstock mines are panning out as usual. Both Belcher and Crown Point are turning out ore and their mills are turning out silver and gold with astonishing rapidity. Our regular weekly letter from Virginia did not come to hand in time for publication in this issue.

Dividends for the past six months from mining companies foot up the handsome sum of \$7,419,181 against the sum of \$4,026,300 during the same period last year, exclusive of coal mining companies. They were as follows:

Belcher	\$3,434,000
Black Bear	15,000
Black Diamond Coal	25,000
Cedarburg	24,000
Cons. Amador	120,000
Crown Point	3,100,000
Diana	1,181
Eureka	50,000
Eureka Con.	50,000
Eastport, Coos Bay Coal	10,000
K. K. Cons.	12,500
La Grange	12,500
Meadow Valley	120,000
Monitor Belmont	50,000
Raymond & Ely	300,000
	\$7,451,451

This includes the two dividend paying coal mines, the dividends without them, being \$7,419,181. This showing for the end of the first six months of the year, augurs well for mining interests for the remainder of the year. Dividends, however, have little effect on the stock market.

On Friday the Stock Market was quite active and strong, but on Saturday it was quite weak without any activity in prices or sale. At close Belcher was \$1 higher. Chollar-Potosi \$1 and Eureka Consolidated 50c.

On Monday the market was strong again especially for Belcher. The American Flat mines all improved a little. Belcher rose \$5, and \$96 was bid after the Board. Crown Point rose \$2; Baltimore Con., \$2; Eureka Con., 25 cents; Ophir, 2; Cverman, \$6; Savage, \$3. Other prices were firm.

Tuesday's market was pretty good, and fair business was done at firm prices. On Wednesday, although prices were firm, the market was not as active as on the previous day.

To-day the market was weak and prices irregular, the fluctuations being of little interest.

The following items of interest from prominent mines are collated from letters or telegrams from superintendents on file at the offices of the respective companies in this city.

Arizona and Utah.

Letter of the 23d says we have resumed sinking the shaft. No water to interfere with work. Rock in bottom working very favorably. We are also going down with incline on east ledge. No material change in quality of rock. We came across some bunches of ore that is good, and will pay well for milling, but the bunches that will not pay predominate. Think we will get ore in milling quantities when in 100 feet.

Belcher.

Dispatch of the 24th says the east crosscut is now in 34 feet in splendid ore. South drift, 1300-foot level, in good ore. No change in crosscut on oil floor or fourth floor. Stopes look well. Car samples, \$107 per ton.

Dispatch of the 25th says the south crosscut, 1200-foot level is in 37 feet. South drift, 1300-foot level, in 269 feet, in splendid ore. No change. Stopes look well. Car samples, \$126.

Crown Point.

Dispatch of the 24th says they are running a drill on the 1400-foot level crosscut, and are now in twelve feet, with but little water. The incline engine is running again, but we will not be able to run more than two cages before four o'clock. No change since last report in other parts of the mine.

Superintendent's letter of the 22d says: "From the first of the month to the 20th, inclusive, we have extracted from the mine, and shipped to the mills, 5,776 tons 1,500 pounds of ore, which, estimated at 65 percent of the assay value, will yield \$300,512.81. The general average per ton, \$50.61. Since the breaking of the spur wheel of the incline engine, which occurred about two weeks since, we have been extracting quite a large amount of ore from the 1000 and 1200-foot levels, and from the fact that ore from the two levels mentioned not being of near so high a grade as the 1300-level is a principal reason that the ore does not run so high as when taken exclusively from the 1300-foot level. The breasts and floors of the 1300-foot level are looking fine and show no symptoms of weakening. The sill floor crosscut from the 1300-foot level and immediately in the fifth floor crosscut was run east a distance of 66 feet, through barren quartz and porphyry. Rich ore was struck and continued for a distance of 14 feet, in ore that will assay from \$150 to \$200 per ton. We have continued this drift 15 feet east of this 14 feet mentioned, and for that distance it has been in porphyry and quartz that shows light assay, and feel confident that we will strike a rich body of ore lying next to the east wall the same as we struck in fifth floor crosscut above. The crosscut from the 1400-foot level south is in 58 feet, in hard, firm quartz, showing small assay, not being in far enough to tap the main ore body."

Dispatch of the 25th says the drill is 15 feet ahead of the crosscut on the 1400-foot level. We are now following it up with the drift. The water has not increased much. No change since the last report elsewhere in the mine. The machinery is running all right.

Raymond & Ely.

Dispatch of the 25th says: "Shipped to-day, \$33,423. Previous shipments in June, \$139,150, making the total for the month, so far, \$172,573."

Imperial.

Letter of the 23d says nothing of importance has occurred in the mine since Saturday. The appearance of the various drifts is unchanged.

MINING SUMMARY.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned:

California.

ALPINE COUNTY.

TANISH.—Alpine "Miner," June 21: Some quartz taken from this mine on the 18th inst. and assayed by Mr. Hunter, yielded in silver about \$125 per ton, and gold enough to make the value of a ton \$150. Work, which was suspended for a few days, has been resumed in this mine.

GLOBE.—We learn from Gen. Winchester that the difficulty of late surrounding this company in N. Y. has been settled, the company winning every point. It is hoped work will soon be resumed on the mine, and the bright prospects last encountered followed up vigorously.

MONITOR & N. W.—In the main tunnel some fine-looking quartz veins have been struck. Silver Glance shows good ore in the 100-ft. level, but the water increases as the drift penetrates the mountain. As the company expects to put up steam-hoisting works very soon, the work is now crowded at present.

TUE EXCHANGUE MILL will start up on Monday next, and with fine prospect of a successful run. Competent men have been employed as amalgamators, who promise to extract the metal by the wet process, if it can be done, and much interest is felt in the result of the trial.

AMADOR COUNTY.

THE GOVERN QUARTZ MINE.—Weekly Ledger, June 21: The Governor Company worked on their mine in April, 1872, and sank a shaft 200 ft., where they drifted east 70 ft. through heavy quartz boulders and struck a gouge about 4 ft., and a beautiful ribbon rock upwards of 12 ft. wide. They then returned and continued sinking on the main shaft 200 ft. farther. From this point they went with well defined foot and hanging walls. The rock taken from this ledge assays over \$90 per ton. They then ran 70 ft. north and found a vein about 4 ft. wide which prospects well. They then ran 40 ft. to the south, found a fine ledge about 3 ft. wide. At the first 200-ft. level a large reservoir was built and empties abundant water above by the use of one of Hooker's best California steam pumps. At the 400-ft. level there is another of these pumps which drains the mine and keeps the reservoir above well filled. From the 40-ft. drift south, they are but 130 ft. from the Fremont mine. The Governor is owned by Messrs. Wilson, Ashby, and other San Francisco men, and is under the able superintendence of Mr. John Trelogan. From what we have learned we feel assured that the Governor has very favorable chances of becoming one of the richest mines in the county. It is situated about one mile north-east from the famous Keystone mine at Amador, and has a good location for mill and working purposes. The Co. have a U. S. Patent for their mine, and are taking steps to secure one for the Fremont.

EL DORADO COUNTY.

STANLEY.—Republican, June 19: A correspondent informs us that another strike has been made in Kelsey District. The Cincinnati mine, lying within three-quarters of a mile of the St. Lawrence, in a north-westerly direction, have struck a very rich body of ore; the ledge is from 7 to 8 feet in width, and prospects from 10 to 50 cents to the lb. This mine is owned and worked by a San Francisco Co., and under the superintendence of Geo. A. Gates, they are pushing the work along rapidly.

We are informed that great activity is manifested in developing quartz mines in Big Canon Mining District, Mud Springs Township. The mine has recently been sold to Baldwin & Cavalieri, of S. F., who will erect hoisting works and mill. The ledge is said to look exceedingly fine, having been sunk 100 ft., average width being 17 ft. Two locations have been made to the north, both of which are being vigorously prospected. Location of the southerly extension have also been made, extending into Amador County, the first shot of Baldwin & Cavalieri being located by T. J. Hunter, the next by Day & Wake, and the next, which takes it to the Amador line, by Frank Swift, all of which are being developed.

INYO COUNTY.

YGNACIA.—Inyo "Independent," June 21: Work has been carried on in developing this mine and taking out ore for several months past. They have on the dump quite a large quantity of ore which would readily command \$250 per ton, and the mine has improved to such an extent that the owners value it at least six times its original cost. It belongs to the Diaz Bros., of Corro Gordo, and another San Francisco party, who, some two years since, sold it for \$10,000 but subsequently took it back. The claim is 950 feet in length, and from all accounts the Ygnacia is valuable property.

KERN COUNTY.

HAYLASH Miner, June 21: At the Pinte, everything moves along like clockwork. We might also say the same of the St. John at Sage-land. Two manual number of men are employed and the work progresses smoothly.

At the Jos Walker the fight against water is progressing with prospects of success soon.

NEVADA COUNTY.

GOLD TUNNEL MINE.—"Transcript," June 25: The frame and water wheel for the new mill at the Gold Tunnel mine is almost completed, and the batteries are being cast. The Co. is putting up a first-class mill, and there will be plenty of first-class rock on the dump for it to crush when completed.

G. V. "Union," June 25th, says: The working for copper is being prosecuted at Mineral Hill, Nevada. The ore is said to assay 65 percent of copper, and is being shipped.

PLUMAS COUNTY.

National, June 21: The hoisting-works of the Dutch Hill Co. were started up last week. The water is raised 325 ft., and will be used on some very rich ground. We expect to hear of some big pay in this claim, before long.

TUOLUMNE COUNTY.

Independent, June 21: The miners in the Garibaldi, two miles below Robinson's Ferry, on the Stanislaus river, have got through the vein with their tunnel, showing a ledge 13 ft. in thickness and free gold—the rock prospecting well throughout.

Nevada.

REES RIVER REVELLE, June 21: All the mines are ending up their rich ores and both stamp mills are grinding away. The water is raised, and the machinery all set, and it is expected to commence hoisting ore by the middle of July. The El Dorado mine never looked as well as at present. The body of sulphuretted ore in the 1,400-ft. level north, now measures 22 ft. from the level of the shaft. This mass of ore averages \$100 per ton. The stream of steel cables has been opened on the lower level, showing some of the finest ore we ever saw. Boulders weighing 100 pounds and upward being broken off are found to be nearly pure metal. This ore assays \$2,500 to \$3,000 per ton. The large steam pump will be lowered in the mine next week. A double track is now being put in, and when the present improvements are completed, there will be no estimate of the amount of ore that can be hoisted from this mine.

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\$2,332 53, belonging to the El Dorado South Co., passed through on the stage last evening.

MANHATTAN BULLION.—Thirteen bars of bullion, weighing 1,361 pounds and valued at \$319,024 61 was shipped by the Manhattan Co. yesterday.

BOLIVIA DISTRICT.—"Silver State," June 21, says: The reports from the rich copper district continue favorable. In the Tidal wave a streak of ore 2 ft. wide, averaging 75 percent metal, has been developed. Andrew Davidson discovered a ledge last week which shows fully as well near the surface as any claim in the district. It has been named the Bouita. Kallogg & Elliot are working vigorously on the wagon road, and are making assay grade over the mountains. There is considerable excitement in the district, and everybody is working with a will. There are no idle men in Bolivia.

BELMONT BULLION SHIPMENT.—Reese River Revelle, June 18: On Monday night Wells, Fargo & Co. shipped four bars of bullion from the El Dorado South mine, Belmont, valued at \$3,091.63, and four bars from the Belmont Company valued at \$6,902.17, and last night was shipped by the same firm from the El Dorado South, Belmont, three bars valued at \$2,180.49, and four bars from the Manhattan Company of this city, valued at \$20,328.39.

MOUNTAIN VIEW MINES.—Sentinel, June 22: We gather the following in relation to the mines of the Mountain View Consolidated Mining Company, situated on the east side of Prospect Mountain, from W. MacDonald the Superintendent: The company own a number of locations, the most important of which are the Anna mine. This mine has an incline run in a distance of 25 ft., which taps a body of ore 6 ft. wide, and increasing in proportions as it is developed. The ore is plumbiferous to a considerable extent and consequently suitable for smelting. No furnace test has yet been made to show what the practical yield would be, but from assays got from fair samples, the owners are confident they will get good prices for the ore. Next in order from the Anna comes the Mountain View claim. On this an incline has been run in 90 ft., and discloses a sort of vein, or elongated deposit, which measures something like two feet latitudinally. Work will be resumed in this incline in a few days. Two shafts have been put down on the Masepepe claim, and a fine showing made as a result. These excavations are respectively 20 and 30 ft. in perpendicular extent.

WASHOE.

ARIZONA AND UTAH.—Gold Hill News, June 21: The main east drift on the 250-ft. level, is in 155-ft., the face still in ledge matter. This drift cut the ledge at a distance of 115 ft. east of the shaft, showing it to be large, well defined, and to contain bunches and spots of good milling ore. Work in the face of the drift has been stopped for the present, and a winze started 120 ft. east of the shaft in the foot-wall of the ledge, and rich developments may soon be looked for.

BALTIMORE CON.—The breaking of one of the hoisting reels on Monday last, almost entirely stopped the work in the mine during the week. The reel was repaired, however, and work resumed last evening with a full force of men on both the 225 and 450-ft. levels.

BELCHER.—Daily yield 500 tons from the four ore-producing ledges. The 1300-ft. level shows finely, and the face of the south crosscut is in splendid ore. The incline is down to the 1400-ft. level and the station being opened. Our sources of information relative to this mine are demoralized to-day.

BUCKETT.—Daily yield about 20 tons. The ore sections are holding out well. The main east drift is in 350 ft., and from the stringers of good quartz, assaying well in gold, coming in at the face of the drift, it is thought that the ledge must be very near at hand.

CALEDONIA.—Extracting the usual amount of milling ore from the 400-ft. level. The prospecting drifts, both north and south, on the 500-ft. level, are still driven energetically ahead, with no new developments to report.

CHOLLAR POTOSI.—Daily yield 100 tons of \$30 rock. The water in the mine has been reduced in quantity to such an extent that the pump is kept on duty only three hours per day. The ore-breasts are looking fully as well as at any time during the past thirty days.

CROWN POINT.—Daily yield 320 tons. Owing to the repairs to the machinery not being completed, the yield is below the average and will be until the latter part of next week, when the new spur wheel will be put in and the difficulty obviated. The ore-breasts of the 1300-ft. level are looking finely and prospecting developments show improvement. The crosscut east of the 1400-ft. level is not in far enough to reach the ledge yet, and no increase of water is tapped indicating close proximity.

CONS. VIRGINIA.—Sinking the shaft is making excellent progress, the rock in the bottom working finely. It is now down 1,045 ft. The main north drift on the 1167-ft. level from the old and Curry shaft, has made out slow progress during the week, on account of the terrible swelling of the ground through which the drift is running. The tremendous force of the swelling was such as to completely close up the working end of the drift, crushing in and smashing the heavy timbers like pipe stems, and although all the men that can be profitably used are employed there, the work has not been reached by several feet the extent attained last week. The heavy stone foundation for the new engine is completed, and the engine will be ready to place in position as soon as the masonry is sufficiently dried.

EMPIRE.—Prospecting at the 1600 and 1700-ft levels being vigorously prosecuted with excellent assays occasionally. At the 1600-ft. a narrow streak of pay ore found in a raise assays over \$50 to the ton.

GOULD & CURRY.—The work of taking the old pumping machinery out of the mine and replacing with new and more powerful, will be completed by the close of next week. The main northeast drift on the 1500-ft. level is still driven ahead, the face being in quartz and porphyry. The main south drift on the 1600-ft. level will make the connection with the north drift on the same level from the Savage to-day. This is an important and much to be desired connection between the two main drifts, and will result in cooling off the different levels, facilitating the work, and affording a means of escape from one mine to the other in case of fire or other contingency. Prospecting at the second station still continues, developing large quantities of low grade ore, but which at the present cost of reduction will hardly pay for extraction.

GLOBE.—Progress in the raise from the main tunnel is very slow and difficult, owing to the great heat, and it is doubted whether the connection can be made with the upper raise without hoisting apparatus being arranged to supply the requisite ventilation.

HALE & NORRIS.—Daily yield 70 tons of ore. Prospecting the 1700-ft. level still continues with unabating energy and no new developments of importance to the mine. The north winze from the 1700-ft. level is down 65 ft. Nothing new to report of the other levels.

IMPERIAL.—About 100 tons per day are being hoisted from between the 1600 and 1700-ft levels, where several good bunches of ore exist. Better deposits are expected when the next level below is opened.

JULIA.—The water is nearly drained from the south crosscut on the 1000-ft. level, and the drift is in 100 ft. so that it is the expectation that work in that portion of the mine can be resumed in a very few days, when some valuable developments are looked for.

JUXTON.—Daily yield 20 tons, from the south mine. Drifting to connect with the 400-ft. level. Nothing new.

KNOCKENBROCK.—The west drift is now in 690 ft., with the face in highly favorable vein matter.

NEW YORK CONS.—The new pump is in and working splendidly. It keeps the water out of the shaft with very little trouble, allowing a fine progress being made in sinking. The shaft is 247 ft. deep and is in a well chosen locality for good ore development.

OSGEO.—Situated in a highly favorable position at both lower and upper levels, and making good progress sinking shaft below the 1465-ft. level. No good developments as yet.

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OCCIDENTAL.—Daily yield 35 tons of ore. The assay of which is from \$30 to \$50 per ton. This ore is taken from 3 cross-cuts in the ledge from the main north tunnel 250 ft. apart, which proves the ore body to be of magnificent extent. It is expected that the ore yield will be greatly increased as soon as the ore-breasts are sufficiently opened, to admit of the employment of more miners.

SAYAGE.—Connection is completed with the Gould & Curry, at the 1600-ft. level, giving much desired and needed ventilation. The lower level conundrum still remains unsolved to the public.

SILVER HILL.—Daily yield about 60 tons. The ore-breasts both north and south at the first station, still continue to improve in yield and quality of ore. The main north drift at the second station is energetically driven ahead and the Bacon mill is kept running on ore from the mine.

SIERRA NEVADA.—The mine shows about the same as at our last report, and this mill is kept running steadily.

SENATOR.—Total depth of shaft 354 ft., having sunk 10 ft. during the week. The vein matter now being panned through is the most rich vein of ore yet encountered, being clay and porphyry, with stringers of quartz, indicating close proximity to the vein.

UTAH.—This mine, after lying idle for several months, was started up last Wednesday, under the superintendence of Sam Owens, one of the most competent and efficient miners on the Comstock. The shaft is 210 ft. in depth and the water has risen within 23 ft. of the surface. The engine and other machinery were started up, worked to perfection, and bailing out the water was immediately commenced. Notwithstanding a strong and steady influx, the water has been lowered over 100 ft., and it is expected that sinking the shaft and prospecting the ledge will be resumed in a very few days.

WAGNER JACKET.—Nothing new since last report. Drifting north and east on the 1500-ft. level, and about the same thing at the 1400.

BELCHER.—Enterprise, June 24: The rich deposit of ore on the 1300-foot level of this mine has now been opened upon to a distance of 261 feet south from the Crown Point line, and it still holds as rich as ever. There were yesterday received at the Bank of California sixteen bars of Belcher bullion, worth \$32,000.

WHITE PINE.

TRENCH MINE.—White Pine News, June 21: V. Butch, of the Trench mine, on White Pine mountain, presented us with a rich specimen of silver-bearing rock. His mine is looking better than ever before. The strike made by his miners has resulted in the discovery of a remarkably well defined and rich vein of ore. It appears that as depth was attained the course of the vein changed gradually to the northwest, pitching at an angle of 35 deg. into the hill, and at a depth of 200 ft. The vein is found of a thickness of 2 1/2 ft., and a width of 12 to 18 in., between two well defined walls. The assays made show the following results: First quality, \$703.75; second, \$518.38; third, \$161.80—all silver, with no trace of gold or other minerals.

We have been shown a specimen from the Caroline mine, worked by Mr. Elles, at Swanscote; it weighs 50 lbs., and valued at \$2 per lb.

ENGAR MINE.—This mine still continues to produce good rock—35 tons daily shipped to the Manhattan mill. With about 30 men employed, it shows well for a mine to produce over a ton to a man of high-grade ore.

ROBINSON DISTRICT.—This district is slowly making its immense mineral wealth known to the world, and it is only a question of time when it will take rank among the richest mining sections. The Brooks mine is showing splendidly, having a shaft down 60 ft. in a continuous body of milling ore of high grade. Being but a short distance from the Hayes mine, the present appearance proves its ultimate worth. Many men are engaged developing their various properties, and all are working with an abiding faith in the future of the country. One great detriment to the prosperity of the camp is the present want of facilities for reduction purposes, there being only one small furnace there, which has never yet succeeded in producing a ton of metal.

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What the Cubans are Fighting for.

The struggle in Cuba has now been actively carried on over five years, and notwithstanding the "Patriots," as they term themselves, have never, within that time, met with anything like a serious reverse; but on the contrary have been constantly, though slowly, gaining ground, it is certainly a little singular that with the exception of a single nationality in South America, which has, itself, been for even a longer time, in a sort of quasi war with Spain, not a government on the globe has officially extended a hand of sympathy toward the party striving to obtain a redress of grievances. Even our own government has stood quietly by, all these long years, looking on as coolly and indifferently as though we had never known what it was to find ourselves engaged in a war under similar, but less provoking circumstances. All the Cubans ask is the common courtesy of belligerent rights almost always, heretofore, extended to any considerable body of people, who have made any positive and continuous stand for the redress of real or even imaginary grievances. All will recollect the readiness with which the nations of Europe extended this customary courtesy in the case of our own late "unpleasantness," even when there was never the slightest official demonstration of any grievance set forth as a justification for a resort to arms.

That the Cubans are not without just cause for a resort to arms—for more than ever existed between our own and the mother country—is well known to all who have been attentive to the history of this conflict. It is so long, however, since these grievances have been set before the world that most people have, no doubt, forgotten them, and perhaps we may be conferring a favor on some of our readers, at least in reproducing them in this connection, in the following condensed form:

The Cubans have stated officially and from mouth to mouth, that they are fighting for Representation, Severance of Church and State, and General Emancipation.

Every one of these are principles traditionally dear to the American people, and ends which we have been taught to believe just causes of war.

Cuba has no representation in the Spanish Cortes, and never had. She has no voice in determining the amount or the method of collection of taxes which she must raise. These taxes, again, are not spent for her benefit, nor has she any power of any kind over them.

The consequences of this disability are:

A burdensome standing army, which weighs down and impoverishes the island.

The rule of the Captain General is absolute and arbitrary.

The exercise of the right of petition has been followed by expatriation and imprisonment.

Corporate associations of the people, for the purposes of science, art or commerce, has been discontinued and impeded. The ports of the island have been closed to foreign ships, for the purpose of creating a monopoly for Spanish bottoms.

For one cause alone—taxation without representation—we went to war, and deemed the step well and prudently taken. No civilized people on the globe ever had better cause of war than have the Liberals of Cuba.

WAGES IN COLORADO.—From a long article on the Briggs mine in the Colorado Register we glean the following item concerning wages: Twenty-five men are employed on the mine at \$3 per day. Bucket fillers, who work 12 hours, get \$3.50. In the mill are two feeders, each working 12 hours, who get \$3.50; three engineers, \$3.50; blacksmith, \$4 per day.

BULLION FREIGHTING.—M. W. Belshaw is fitting up a fast-freight line of eighty teams for the transportation of bullion, to be run on the Los Angeles road for "the Inyo trade."

UTAH INVESTMENTS.—It is said that San Francisco capitalists are negotiating for a mining property in Salt Lake, for \$500,000. The matter has not yet been fully arranged.

THE DARDANELLES Mining Company has increased its capital stock from \$2,400,000 to \$6,000,000.

OVER \$300,000 in treasure left this city last week by rail, \$229,023 was in silver bars.

ORE SHIPMENTS from mines on the Comstock are about 95 car loads per day.

THE manufacture of bricks has been commenced in Truckee.

IRON ORE of good quality has been found in City Creek, Utah.

WAGES at Missoula, Montana, are from \$4.50 to \$5 per day.

QUICKSILVER is quoted at £14 per hottle in Liverpool.

A PLANING MILL is to be erected at Santa Barbara.

The Banana.

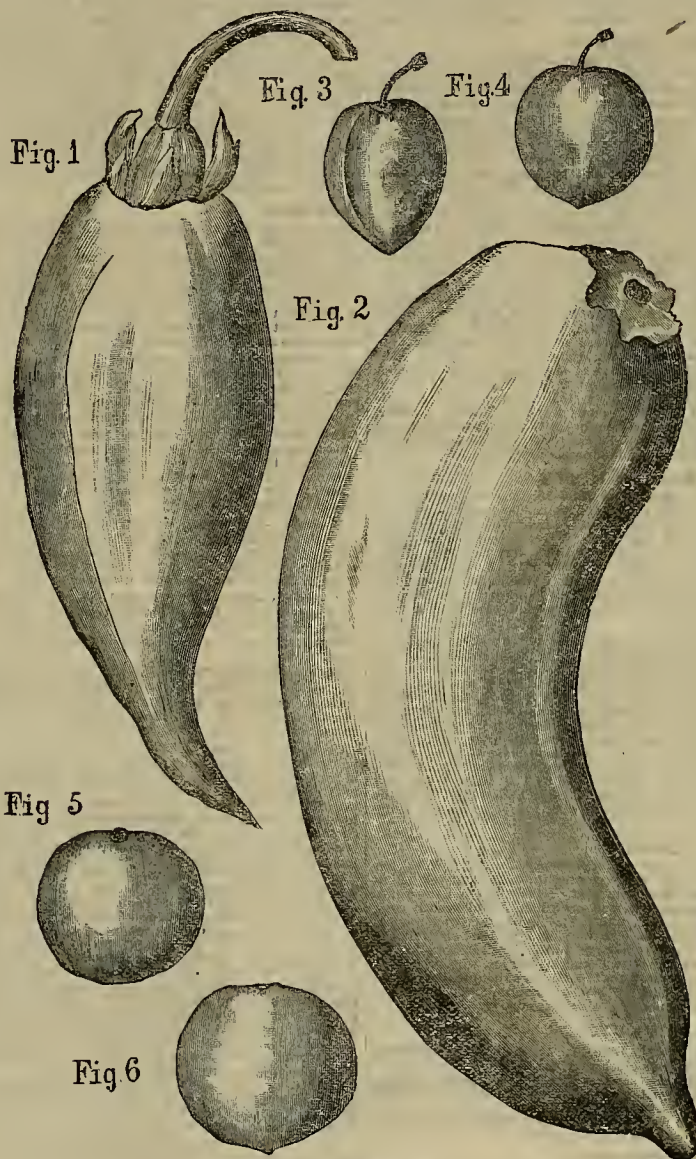
In pursuing our descriptions and illustrations of the indigenous fruits of our country, we come now to speak of the Banana. The genus *Musa* of the Musad family, is one of the most important found in tropical countries, and the principal food of vast numbers of the inhabitants of hot climates. It is in many places the chief support of a family, as an extent of ground which sown in wheat could only maintain two persons, will yield in bananas sufficient sustenance for a family of fifty.

Numerous varieties are produced from seeds and in some of these varieties it seems indigenous to almost all hot countries. Besides its utility as an article of food, a strong fibre is obtained from the leaves and stems, of remarkable fineness. An intoxicating drink is also made from the fermented fruit, which the In-

parts of California where the more tropical varieties might not succeed as well.

In Figs. 3, 4, 5 and 6 we present full size illustrations of different varieties of Dwarf Cherries (*Prunus pumila*) found in many parts of the country, both east and west of the Rocky Mountains. It seems more properly a species of plum; grows upon a hush from two to six feet high; fruit larger than a damson, sweet, and in color from a light pink to a deep crimson, and from a light to a deep yellow. The shrub thrives in sandy places and the fruit is sometimes gathered in large quantities by the Indians, wherever obtainable and dried for future use, plum gathering being one of their festival seasons. The tree has been domesticated in California and the fruit makes excellent preserves.

MEN AND MEMORIES OF THE SPRING OF '50.—Hurrah for the forty-niners! This spicy and well prepared narrative, strikes at once a sympathetic cord in the hearts—not only of every man of them who was "pars magna fui," but



NATIVE FRUITS.

dians or natives are not slow to avail themselves of, and this remark is equally true of nearly all sweet fruits in any country.

Besides the Banana and Plantain with their slightly varied varieties, common to the West Indies and Central America, we illustrate in Fig. 1 and Fig. 2 varieties found growing further north than the more tropical varieties, common to Northern Mexico, Arizona, and Southern Utah. The plant is there known as the Spanish Bayonet (*yucca baccata*). The fruit is produced upon a stem a little longer than the leaves, with several laterals. They vary in shape, some of them resembling the West India banana and nearly equal to them in flavor.

This fruit is of a greenish-yellow color, of a soft pulpy nature, very sweet and palatable and differing from their prototypes of more tropical climes in having large black seeds, and being produced only every other year from the same plant. The natives of the countries where grown, dry large quantities of the fruit for winter use. Even the unripe fruit is roasted in hot ashes and eaten with avidity, while the young flower buds when about to expand are also roasted, being a highly-prized article of diet.

The leaves of this species of *Yucca* yield a long and strong fibre, somewhat coarse but very durable. The plant will grow on the poorest kind of dry soil and could be grown in many

of all who have lived in, and loved California.

Who, among the Argonauts of those noted times, especially those advanced in years, does not delight to dwell on "auld lang syne," or the early days of our State's history? Messrs. Barry & Patten have shown themselves, as was expected of them when the book was announced for publication, admirably well qualified to illustrate in thrilling language and fit terms those stirring and remarkable times when people rushed here in search of the "Golden Fleece." This is indeed San Francisco—most graphically depicted—in the spring of '50. The work, no doubt, will be most extensively sought for and read not only on the whole Pacific Slope but far away Eastward. It is full of lively, quaint and humorous anecdotes. It is truly a characteristic picture of the peculiarities,—funny, and pathetic too, of this unique era in the history of our race and country. A. L. Bancroft & Co. are the publishers.

The earnings of the Central Pacific Railroad for the last month, are said to be the largest since the completion of the road, aggregating more than a million and a quarter of dollars.

From the Borax Fields.

A correspondent of the *Bulletin* writes as follows from Columbus, Nev.: No doubt you have heard of this place as the center of the great borax district, but if you were here to-day you would say it was the center of Old Boreas' regions, where he held undisputed sway. For the last twenty-four hours he has kept up the most dismal howling and such fierce charges round the corners, with such clouds of dust, old tin cans, boxes, bits of paper and other debris flying through the air, as to render it almost unsafe to venture out. And this day is no exceptional day. I have seen at least a dozen such in the last month. Take one of San Francisco's worst windy days and multiply it by five and you have this day. The wonder is that the wind does so little damage, but there is little to be affected by it on this barren plain unless to change the base of the dust. The bones are all one-story and mostly built of concrete, which is very hard and firm, and there is little surplus wood or lumber lying round loose at the sport of the winds, both being too scarce and too expensive. Wood is \$20 per cord and lumber of very poor quality \$125 per thousand. All the wood is brought twenty miles by teams, and the lumber is brought from Wadsworth, (150 miles,) and there is little to be had at any price owing to the scarcity of teams and high prices of freight.

The Climate—A Barren Region.

We had quite a heavy shower of hail yesterday, which lasted fifteen minutes, making it quite wintry for a while. There are no snow or rain storms here winter or summer, only a little hail or rain showers, like yesterday, for a few moments. The winters are not cold, the thermometer rarely falling below 20 degrees above zero; but the summers are very hot when they begin. It is like living on a sand heap with a glass case over you. There is not a blade of grass or tree or shrub, except some very scant bunches of grease wood, to be seen on this whole plain ten miles in extent. It is perfectly level, and covered for the most part with a white saline deposit, which will kill any plant put into it. I had to send twenty-five miles to get a box of soil to plant some flower seeds in, and now I have quite a fine display of nasturtiums and sweet peas in my window, the admiration of all passers. To-day a poor deluded horse looked in and tried to thrust his nose into the window to get a bit of the tempting green morsel. I felt real sympathy for the poor brute, and thought what a feast it would be to my eyes to see the beautiful gardens and orchards around Oakland and vicinity and get a taste of the delicious fruits and vegetables you are reveling in now, and which we must be denied all the year round. But, thanks to canned fruit and vegetables, we are very well compensated at very round prices. Teams bring all merchandise from Wadsworth, the nearest point of shipment, by railroad. They are one month making the round trip. The route is destitute of grass or water the most of the way, and teamsters have to take a supply for their animals both ways. The new road, by way of Carson, which will be open about the first of July, will be through a more fertile region, and though the route will not be much shorter, it will have this advantage—plenty of water and cheap feed for the animals.

Borax Mines.

There are very extensive deposits of borate of lime and borate of soda in this place and vicinity. The Pacific Borax Company's works here are making about fifty tons per month of borax; and the works at Seel's Marsh and Fish Lake are making about as much more; but, owing to the decline in the price of the article, there will not be so much interest in this branch of business.

Gold and Silver Mines.

There are several rich silver mines worked here, one owned by A. G. Holmes & Co. has a fine showing of ore at present, a well defined ledge, at a depth of 400 feet, with a large amount of rich ore in eight. Messrs. Sweet, Apple and Harseltine, have a mine, two miles from town, which is yielding well. They are running a quartz mill day and night. The Columbus Mill and Mining Company, under the superintendence of Colonel Jeremiah Milles, are running a ten stamp mill night and day, also.

THE PAUL PROCESS.—We yesterday had the pleasure of again meeting Cole Sanders, Esq., of Montana, who has just returned from a visit to the Paul Mill at Springville, and from him learn the following particulars: That it is the best constructed automatic mill he ever saw, and does fully all that is claimed for it in the way of crushing ores. The amalgamating barrel and settler work beautifully, and four men in twenty-four hours do the work of ten men by the ordinary stamp mill. Mr. Saunders states that the proprietors, however, disclaim to give results of their working, as they claim they are not using at this time all the chemicals that Mr. Paul desires should be used, yet they say they are well satisfied with the results already obtained, and have ordered another set of machinery. If Mr. Saunders can be convinced or guaranteed results such as Mr. Paul claims, he will without delay erect his machinery in Montana in place of the ordinary stamp mill, as contemplated, so pleased is he with the other operations of the Paul Mill.—*Salt Lake Journal*.

USEFUL INFORMATION.

Blacksmiths and Machinists.

Every one had an opportunity to employ different kinds of workmen to assist him in the construction of novel machinery, will agree with us that he always had the least trouble with the blacksmiths. As a class of workmen they generally possess the best judgment, and will not misunderstand the directions given which is so often the case with other workmen, and they have the special faculties of possessing a good eye for symmetry of form. They will judge by the eye alone, quite correctly, if an angle is right, a circle round, etc. This latter faculty is a result of their training. While the carpenter lays his square on the work, and marks it off beforehand, the blacksmith more ordinarily makes his right angles by sight, and can only resort to the square to see if he was correct.

In regard to utility for social progress, the business of the blacksmith also stands foremost. What would the most useful of all producers, the farmer he, even in his most primitive state, without the blacksmith. It has been noticed that at the present day few young men care to learn that trade; the cause is that it requires so much hard, muscular labor. Thousands prefer, therefore, to become machinists, and then they have all sorts of mechanical tools to shape their work, without the hard labor with nimble hammer and sledge, and also that as machinists they can, in this thriving country, find always more ready employment than in the blacksmith's trade.

In fact, the occupation of machinists is at the present day the foundation of almost all other trades, as we owe to it the invention of many tools which facilitate labor of all kinds. Without the appliances invented by the machinists of the present day, we should indeed have no steamboats, railroads or steam power; the ingenuity of inventors, in attempting to supply the present race of men, has in fact, created the machinist's trade; and this by inventing the forge hammer driven by steam, and other similar inventions, which have succeeded in shaping masses which no sledge hammer could manage. It was thus demonstrated what bold conception could practically be realized, and this in turn stimulated inventors and capitalists to expand their ideas, and go on in conceiving and supporting the most gigantic projects, which our forefathers would have considered impossible of execution, but which our mechanical engineers have practically realized, and in persisting to do so, continually surpass their own former efforts.

Also in small, but not less useful matters, the inventive genius of the machinist is eminently active at the present day, not only in regard to the saving of labor and time, but also in saving expenses for divers pieces of machinery, by contriving a machine to do the work of two or more distinct ones.—*Bulletin.*

PROPOSER BRILLIANT ILLUMINATION.—A Mr. P. A. Vickers proposes to the people of Oregon to illuminate the top of Mount Hood on the night of the Fourth of July, in such a manner that the light will be witnessed by thousands in that State, as well as in Washington Territory. For this magnificent display he asks only a slight remuneration, "to be paid upon the accomplishment of his grand design." A writer in the *Portland Bulletin* recommends Mr. Vickers and Scheme. "If he fail," says the correspondent, nothing will be lost to the community. If he succeeds, Oregon or rather, Portland, will have been instrumental in making the most signal and gigantic pyrotechnic display the world has, perhaps, ever seen on such an occasion; and the investment by the committee will never be regretted. The conditions are certainly moderate, and Mr. Vickers will probably be told to go ahead with his grand illumination.

TALE OF THE WHITE AND BLACK.—A correspondent of the *Country Gentleman* says: Every spotted dog has the end of his tail white, and every spotted cat the end of the tail black. Of the fact there can be no doubt. I have examined dogs and cats without number in France, in England, and America, and always noticed the same result. The dog affair is not original with me, but the cat is. Our former minister to Japan, Mr. Harris, first mentioned the fact concerning the dog in a letter to the *New York Times*, published some years since. I have looked at many paintings of dogs in the galleries of Paris, and elsewhere, in regard to this, and found even there the dogs spotted, always "in order," proving to me that the artists had invariably copied after nature.

THE INK OF THE ANCIENTS.—In a letter from Mr. Joseph Ellis, of Brighton, addressed to the *Society of Arts Journal*, he states that by making a solution of shellac with borax in water, and adding a suitable proportion of pure lamp black, an ink is produced which is indestructible by time or chemical agents, and which, on drying, will present a polished surface, as with the ink found on Egyptian papyrus. He made ink in the way described, and proved, if not its identity with that of ancient Egypt, yet the correctness of the formula, which was given him by the late Mr. Charles Hackett, F. R. S.

DURABILITY OF CYPRESS WOOD.—It is said that the ancient gates of Constantinople, which endured the attacks of decay for more than 1100 years, were made of cypress wood.

WHY IT IS CALLED ROSEWOOD.—Did any of our readers ever wonder why the dark wood so highly valued for furniture should be called rosewood? Its color certainly does not look much like that of a rose, so we must look for some other reason. We are told that when the tree is first cut, the fresh wood possesses a very strong rose-like fragrance, hence the name. There are half a dozen or more distinct kinds of rosewood-tree. The varieties are found in South America and in the East Indies and neighboring islands. Sometimes the trees grow so large that planks four feet broad and ten in length can be cut from one of them. These broad planks are principally used to make the tops of piano-fortes. When growing in the forest, the rosewood-tree is remarkable for its beauty, but such is its value in manufactures as an ornamental wood that some of the forests where it once grew abundantly, have now scarcely a single specimen. In Madras, the government has prudently had great plantations of this tree set out in order to keep up the supply.

HOW THE DIAMOND CUTS GLASS.—Dr. Wallaston ascertained that the parts of the glass to which the diamond is applied are forced asunder, as by a wedge, to a most minute distance, without being removed; so that a superficial continuous crack is made from one end of the intended cut to the other. After this, any small force applied to one extremity is sufficient to extend this crack through all the whole substance and across the glass; for since the strain at each instant in the progress of the crack is confined nearly to a mathematical point at the bottom of the fissure, the effort necessary for carrying it through is proportionally small. Dr. Wallaston found by trial that the cut caused by the mere passage of the diamond need not penetrate so much as the two-hundredth part of an inch. He found also that other mineral bodies, recently ground into the same form, are capable of cutting glass; but they can not long retain that power, from want of the requisite hardness.

GOOD HEALTH.

Good Nature Can be Cultivated.

Good nature is a sign of health and sweetness, and is cultivated by cultivating these conditions, especially the first. When digestion is good, the blood is abundant and rich and all the organs of the body and mind are well fed, when if the sleep is abundant, and cares not too many, good nature comes of itself.

It is a favorite notion among the scientists that the coal we dig from the mine, with which to warm our houses and drive our machinery is but the sunshine of former ages, stored up for future use; and the comparison is very apt. And so we may say that a good-natured, jolly, wholesome man consists mainly in an unusual amount of sunshine turned into light and life.

Mr. Beecher in one of his pointed *Ledger* letters says: "There is so much care in life, so many that are victims of low spirits, so much of sorrow, so many that are languid through sickness or grief, or watching, or want, that any one who can throw a ray of light upon their spirits is a benefactor indeed. Good nature is the most practical of all kinds of benevolence. It gives itself forth without measure. It shines, like the sun, into all places, high and low alike. It chooses nothing, but blesses all, without discrimination. It allays strifes, pours oil upon friction, lightens the tasks of life, and diffuses a cheer and glow which wine cannot give; and all this, too, while the cause of all this blessing is himself, blessed above all."

Some men are good-natured in spots, some are good-natured when they have their own way, or have fallen upon some good luck; some are good-natured when at ease, but cross when burdened; some are good-natured in company, and cross at home—all smiles and geniality in the store and among customers, but lowering and mooping at home. Now and then we find a real son of light—a hero of the luminous heart! One who beams forth like summer upon all, everywhere; whom all men bless when he comes, and all miss when he goes! Such men ought to wear crowns. They do. Grateful thoughts, love and joy form the crown. They wear it unconsciously, but a hundred hearts place it upon their heads, and they go crowned with light all their days!"

DYSPEPSIA.—Dyspepsia is the most multitudinous disease extant. No two dyspeptics are precisely alike, while each may have more morbid feelings and variable sensations than he could relate in a week, as they are forever changing. In general terms, a dyspeptic should eat plain, simple food, at regular hours, masticate thoroughly, drink little or nothing while eating, take frequent and regular exercise, but always short of fatigue, sleep all that is possible, and bathe twice a week.

WARTS.—Apply to the wart with the end of a knitting needle a little fuming nitric acid, to be had of the apothecaries. Repeat the application once or twice, and in two or three days the excrescence will come off without leaving any mark.

Summer Drinks.

No beers, or wines, or brandies—nothing alcoholic! They are carbonaceous, and increase the heat and fever of the system; they clog up instead of lightening; they debilitate instead of giving strength. The tendency of the system in all lands, in summer, is to biliousness—to bilious diseases; we call them fevers. This is because we eat more than we wear out by exercise or labor; hence, the body becomes too full.

The great scavenger or emptier of the body is the liver; it is like the pump in a sinking vessel; you must keep it at work, or all is lost. As warm weather renders us incapable of doing as much work in summer as in winter, and as work was intended, in part, to work out the wastes of the system, some substitute must be provided, some compensating power. That power is the liver. It must be made to do more work in summer, and a beneficial Providence has made provision for this in sending us the berries and fruits of warm weather, which contain an ingredient (the acid) which, after six thousand years, the French found out, has its efficacy towards cooling off the body by acting on the liver—having an effect upon it to make it work more actively, and thus more promptly remove the bile, which is the waste matter of the system, from the blood.

Everybody knew that fruits and berries were cooling—were "healthy;" but how they were, was not definitely known until within a few years. The wisdom and benevolence of our Maker in this thing, surely, will command our affections, in that He has provided these fruits and berries in such generous profusion, and combined a necessary quality with such a delicious taste, that every soul of man is perfectly ravenous for them, and we can eat them without harm, to our utmost fill, if ripe, raw, and perfect, and taken alone.

In the absence of fruits and berries, we may obtain the needed natural acid from the lemon, diluted with water; but the most universally available acid drink for summer as a natural aid to the liver is buttermilk, not an ounce of which should ever be wasted, to be taken at meal times, or between meals when thirsty.

For the harvest-field, buttermilk is the safest, most healthful and cooling of summer drinks, to be taken at the temperature of the air. If a mouthful is swallowed at a time with a distinct interval, the thirst will be better satisfied with a quarter of a pint, than if a whole cupful is taken without being removed from the lips.

A palatable and safe summer drink for outdoor workers is water, of the natural temperature, sweetened with molasses. All root beers are pernicious.—*Hall's Journal of Health.*

Nourishment for Food.

The wholesome or unwholesome character of any aliment depends, in a great measure, on the state of the digestive organs, in any given case. Sometimes, a particular kind of food is called wholesome because it produces a beneficial effect of a particular character on the system of an individual. In this case, however, it is to be considered as a medicine, and can be called wholesome only for those whose system are in the same condition. Very often a simple aliment is made indigestible by artificial cookery. Aliments abundant in fat are unwholesome, because fat resists the operation of the gastric juice. The addition of two much spice makes many an innocent aliment injurious, because spices resist the action of the digestive organs, and produce an irritation of particular parts of the system.

In any given case, the digestive power of the individual is to be considered, in order to determine whether a particular aliment is wholesome or not. In general, we can only say, that aliment is healthy which is easily soluble, and is suited to the power of digestion of the individual; and, in order to render the aliment perfect, the nutritious parts must be mixed up with a certain quantity of innocent substance affording no nourishment, to fill the stomach; because there is no doubt that many persons injure their health by taking too much nutritious food. In this case, the nutritious parts, which can not be dissolved, act precisely like food which is, in itself, indigestible.

It is a very mistaken idea that the nourishment in food is according to the quantity; a person may eat a great deal of some article, and receive very little nourishment from them. The quantity of nourishment depends greatly on the aromatic flavor contained in food; and whatever is insipid to the taste is of little service to the stomach. Now, the difference between good cookery and bad cookery lies principally in the development of the flavor of our food; articles properly cooked yield the whole of it; by good cookery we make the most of everything—hy had cookery, the least.

ANTIDOTE TO PHOSPHORUS POISON.—On good authority it is promulgated that two drops of turpentine oil in a little milk is a complete antidote to phosphorus poison. Children not unfrequently bite off the charged end of phosphoric matches and swallow them. It is stated that a girl was recently saved in England by this newly discovered remedy, who had actually eight match ends in her stomach.

THE PHILOSOPHY OF THE CHILL FROM WET CLOTHES.—Few persons understand fully the reason why wet clothes exert such a chilling influence. It is simply this: Water, when it evaporates, carries off an enormous amount of heat, in what is called the latent form. One pound of water in vapor contains as much heat as nine or ten pounds of liquid water, and all this heat must, of course, be taken from this body. If our clothes are moistened with three pounds of water, that is, if, by wetting, they are rendered three pounds heavier, these three pounds will, in drying, carry off as much heat as would raise three gallons of ice-cold water to the boiling point. Is it any wonder then that damp clothes chill us?

BUTTERMILK is an important aid to the digestion of any food taken with it; and by many hygienists is regarded as an excellent substitute for fruit in winter, and a prevention of spring sickness. It is especially recommended to invalids who suffer from indigestion—drink it at meal times.

DOES BREATHING COLD AIR COOL THE LUNGS? Breathing cold air does not reduce the temperature of these organs to any appreciable extent. It is probable that oxygenation goes on more rapidly in the lungs than elsewhere, thus keeping up the supply of heat, lost by introducing cold air into them.

DOMESTIC ECONOMY.

Cooking Eggs.

Eggs bear a relation to other animal food similar to that which seeds bear to other vegetable food. They are the depositories of vitality, stored up to form a new link in the continuation of the species. They are probably the purest form of animal food, though they compare unfavorably with seeds in several respects. They lose their vitality sooner, and they parts more or less of whatever impurities may have belonged to the animal that produced them. They are not so nutritious as some of the seeds, and they require more care in cooking.

Like seeds, one of their principal ingredients is albumen, which is nearly pure in the white; but, unlike vegetable albumen, it coagulates with heat. If the heat is great, it becomes so hard as to be extremely difficult of digestion. Hence eggs are more easily digested raw than cooked, and hence also the objection to hard-boiling. Dr. Beaumont found bits of hard-boiled egg-white, no larger than a pea, sometimes remained in the stomach after everything else had yielded to the action of the gastric juice. Such logic is unanswerable. He deduced from it the importance of careful mastication. We women can go a step further, and find in it an intelligent reason for so cooking the eggs, that they will not require this extra care. Fried eggs are still worse than those which are boiled, both because subjected to a greater degree of heat, and because of cooking fat into them.

Even in the common method of boiling them rapidly, "three and a half minutes," the albumen next the shell is quite too hard. It should be uniform and custard-like, and this is secured by the method, now becoming quite common, of merely letting the eggs stand from seven to ten minutes in hot water. This should be boiling hot at first, but the cool eggs reduce its temperature somewhat. The exact time required will vary with the relative proportions of egg and water, with the size of the eggs, with the heat and thickness of the utensil used, with the warmth of the place where it stands, and with the weather also; a little more time being required in dull weather. The cook will soon learn what allowance to make for her utensils; and for the rest, she must use her judgment every time. They are not so easily spoiled, however, as in boiling. If left in a little too long, they can be plunged into cold water for a minute or two. If even kept hot until the yolks stiffen, the whites will not be hard. The yolk should be cooked just enough not to break rapidly when turned out. These are, properly speaking, not "boiled eggs," but "curled eggs."

These curled eggs make an admirable dressing for many breakfast dishes—boiled camp, oatmeal mush, cracked wheat, and especially for small hominy. The gentle method of cooking eggs may also be observed in making egg-toast. Have the milk almost boiling in a fit dish, and brook in the eggs one by one, cooking a few at a time, and being careful not to let them run together. Sprinkle in a little salt, and let them stand hot and covered, until firm enough to take up without breaking. Then have ready some split butter-biscuits (gems), softened in hot milk and laid on a platter, and when the eggs are done, dish them one on each half of a biscuit, and serve warm. This is a handsome dish, and though not quite so digestible as hominy dressed with eggs curdled in the shell, it is still far better than the fried potatoes and griddle-cake that form the staple of so many breakfasts.—*Science of Health.*

COOKING BEETS.—The true way to cook a beet is to bake, not boil it. Thus treated and sliced either in vinegar or butter it is exceedingly palatable and nutritious. Boiling extracts the most valuable part of this vegetable,

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San Francisco:

Saturday Morning, June 28, 1873.

Legal Tender Rates.—S. F., Thurs., June 26.—buying 85½; selling 87.

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Volume XXVI.

With this number of the MINING AND SCIENTIFIC PRESS, we close volume XXVI, and celebrate the Thirtieth Anniversary of its existence. We have, during the past six months, had most convincing proofs of the increasing interest taken in our work by our readers, and of the assistance we have been able to render them, in their every-day occupations. The mining community on this coast, who are our chief patrons, have increased in numbers as facilities of transportation, improved processes and the number of mines has increased. Mechanical appliances and interests, have not, been by any means neglected, and we number many subscribers among the mechanics, foundry-men, etc., on the coast.

We devote our time and space mainly to these interests. No new device or process in any country escapes our notice, and whatever will benefit the mining community in the slightest degree, receives our fullest attention. We can refer with pleasure to the number of mining illustrations and the amount of matter with relation to the mining interests, we have published during the past six months. We have given in full all the State Mining Laws under the New Code; the Mining Laws of May 10th, 1872, with complete instructions from the Secretary of the Land Office; the Coal Land Law; all the decisions and instructions of the Government Department in any way referring to the mining interests, which, together with a complete and general Mining Summary, comprising items of interest from all parts of the country, makes a large amount of such news.

In addition to this it has been our aim in the editorial columns to give such subjects as would interest and benefit the miners of the Coast,

full attention, without devoting any space to wrangling with our brethren of the press, or to political or other issues, as is too often the case. Our Stock Reports have been remodelled, the tables extended so as to be more comprehensive, the style of type reduced to afford more room, and that particular department of our paper is now more valuable than ever before. We have regular correspondents in the more prominent mining localities and travelling correspondents who periodically visit every mining section of importance in order to keep our readers posted as far as possible with the march of development. The voluminous index on the last page of this issue, which covers only half a year and is, moreover, very much condensed, is of itself sufficient guarantee of the quality and amount of reading we have furnished. We will endeavor in the future, as in the past, to merit the patronage and esteem of our readers by conscientiously looking out for their interests to the best of our ability.

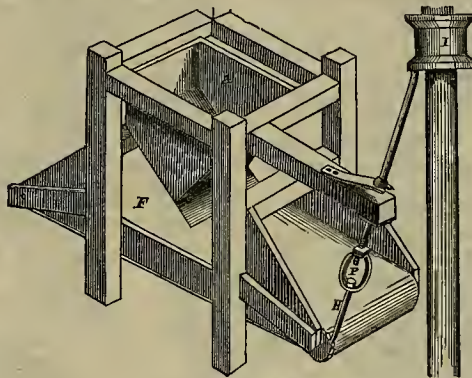
Since the beginning of the year we have added a new cylinder press, enlarged our office and otherwise extended our facilities for carrying on business. This has, of course, been attended with considerable expense, but our increasing circulation, and steady and extending advertising patronage has warranted the outlay. Recent developments and the extension of the mining field on this coast, has brought us many additional patrons and enables us to furnish a better paper than in years gone by. The special field of journalism in which we labor is no longer, by any means, a limited one, and is increasing year by year. Extensive patronage is essential to newspaper success, and while we have no complaints to offer on that score, at the same time we would suggest that the close of the volume is a good time for our readers to renew their subscriptions and invite others to patronize our paper, if it is believed that by so doing they will be pleased and profited.

Ore Feeder for Quartz Mills.

The cut shown herewith is a representation of Cochran's Ore Feeder, an invention recently patented through the agency connected with this office, and of which we spoke in our last issue. The main feature of the device is its adaptability to feeding wet ores, a great desideratum in self-feeders. Its construction will be seen by reference to the cut. A hopper is supported on a frame, situated close to the machinery, into which it is intended to feed the ore.

On the lower side the frame timbers extend out from one side to the proper distance to support a roller above where it is desired to drop the ore. Another roller is supported inside of the frame, parallel with the outside roller. A broad endless band, or apron, passes around these two rollers so that its upper surface will travel just below the lower or feed-opening of the hopper. A ratchet wheel is secured to one end of the outside roller and is operated by a strong bar from the tappet on the stamp stem or some other part of the machinery, causing the roller to revolve, and thus move the endless band. The bar which strikes the ratchet wheel is supported on the end of a projecting timber, and a spring serves to lift it after each drop of the stamp. A turn-buckle is inserted in the length of this rod so as to permit of the lengthening or shortening of the rod for regulating the amount of feed. The upper end of this bar rests beneath the tappet as shown and consequently it will be supported in an incline position in order that its lower end may engage with the ratchet.

The machine operates as follows: The ore is placed in the hopper and passes through the lower opening which is regulated according to the quantity it is desired to feed; after passing through it is received on the horizontal endless band. As the stamp falls the tappet operates the bar and causes the roller to revolve, feeding the ore forward by moving the belt, thus automatically supplying the stamps with the proper quantity to be fed, as when a sufficient quantity is beneath the stamp it will not drop so far and will not operate the feeding device, but when the ore diminishes the drop is greater and the feeding increased. This arrangement is quite simple and possesses the advantage of being able to feed very wet ore without trouble. The device was patented by T. A. Cochran, of Jamestown, Tuolumne county, Cal.



COCHRAN'S ORE FEEDER.

This manner of mining for asbestos being necessary, a small deposit of, say, 18 inches in width would be valueless, since so much waste ground would have to be removed. Where a good sized ledge is found it could be blasted or quarried out easily, and nothing but the substance itself be removed. The fibrous asbestos seems, in the mine mentioned, to be even more plentiful in the center but runs more or less all through. Some have been taken out which was of the texture of silk, and softness of satin, but was at the same time quite tough in fiber. The crystals or long fibers sometimes occur all over the vein, and again are confined to the middle of it; it occurs in the common gray stone of our mountains.

Asbestos was well known to the ancients, and it is said that they manufactured from it incombustible wicks and when these became encrusted with oil, they were plunged into a burning furnace to purify them. The fibers possess very little cohesive power, and resemble very much the filamentous products of the vegetable kingdom. This peculiar texture deceived the ancients, and Pliny writes that "this linen" grows in the deserts of India—arid and scorching—thus the climate that produces it, accustoms it to the action of fire. The ancients spun it into sheets, napkins, head-dresses, etc., which were thrown into the fire when soiled, coming out white, the foreign matter being destroyed by the fire without altering the texture. What a jolly thing, if some enterprising inventor were to turn his attention this way, and manufacture shirts from it. It would be a good thing in the mining camps where wives and washerwomen are scarce, and might help to solve the Chinese question in California, by taking away the occupation of the cheap Chinese laundry man. Another use to which the ancients put it, was to enclose the bodies of their dead in a sheet made of asbestos, and then the body was burned on the funeral pyre; the ashes were easily gathered for preservation.

The great difficulty with the mineral as far as weaving it into cloth is concerned is the difficulty of finding it in fibres of sufficient length. In most cases the fibres are short, but in certain localities it can be taken out in great lengths. In making it into cloth it is woven,

Asbestos.

This peculiar mineral, which has been found in various localities on the Pacific Coast, is rather an unfamiliar substance, concerning which little is generally known. We have of late received numerous inquiries concerning the uses to which it may be put, and have also had several specimens sent to us for examination. Some of these specimens are very handsome, with long delicate fibres of silky hue and flexibility; others again looking more like soapstone than asbestos. Some of our readers will probably be interested in learning something of the method of mining this substance and the uses to which it is put.

As far as we know, only one company has been formed on this coast for the purpose of mining for this material, and very little has been accomplished by them as yet. The company we allude to was formed in April of this year, but so far not even a working capital has been raised. The mine is in this State, in a favorable locality for transportation of material; but there is only a limited demand at a price of \$60 per ton. There is a regularly defined vein of the substance, varying in width from six to ten feet. It crops out on the surface in different places some 4,000 feet. From an old tunnel in the hill where the ledge occurs, it was ascertained that it had a depth of 400 feet from the croppings; how much further it runs down is undetermined. The vein is between two wall rocks the same as a regular quartz vein; on the outside edge of the vein the material looks like a whitish green soapstone, and is compact in form, but the fibrous substance runs all through it; some fibers are taken out five feet in length. The people who have worked this claim, state that it is a very difficult substance to mine, except, in one way. Blasting has little effect; it is like blasting in cotton; it has to be regularly quarried out. The fibers run up and down, and a "breast" is made so that the miner may pick it down easily. After sinking along the vein in this way, a new breast can be made of sufficient height to enable a man to work easily, and reach the top. It is almost impossible to dig across the deposit, and we understand that the parties who crossed the vein we refer to, in running the old tunnel spoken of above, state that it cost them \$500 to get across the asbestos ledge; they did not at that time know what the substance was.

Asbestos has been found in many places in the Atlantic States, in Virginia, New York, and elsewhere. As long ago as 1860 a lead of this substance was found near Russian river, in Sonoma County, in this State. It was also found near Auburn on the line of the Central Pacific Railroad. The latter vein was, however, only about six inches in width, which accounts, probably, for its not being worked now. Australia contains it and the island of Corsica is noted for the quality and abundance of this mineral. Quite a number of other deposits or veins of small size are said to exist in the locality of the mine spoken of at the beginning of this article; but if the large one will not pay, or there is a very limited demand for the substance, it is scarcely worth while to work the small one. If, however, we have on this coast a superior article as would appear, and the roofing and boiler covering men are successful in introducing their manufactures, a steady demand for the product will doubtless spring up and the mine will pay to work. It is said also that a good fire-proof paint can be made of it as well as fire-bricks for furnaces. If either of these ideas were carried out practically to any extent, it would cause a large consumption of asbestos to the manifest advantage of our mine owners. It would then be worth prospecting, and it doubtless exists in many localities this side of the mountains and especially in California. Besides the localities spoken of above, it is found in Savoy, Piedmont, Tyrol, Hungary, Cape of Good Hope and Scotland.

There are numerous varieties which were enumerated some time since by a French journal. *Luberiform Asbestos* or *Asbestos terri*, of Haüy, is softer than the others—it absorbs water more readily; its ordinary colors are a dirty gray and a yellowish white. Sometimes it is in thick and spongy pieces, and is then called vulgarly "mountain flesh," sometimes nearly the texture of cork, and then called "mountain cork;" again, it is hard and membranous and very flexible, when it is termed "mountain paper." The *Ligniform Asbestos* or "mountain wood," of Brochant, is of a reddish or brownish color, and resembles splinters of wood. The asbestos of Savoy is silky and fine as linen. Asbestos is composed of several metallic oxides, lime, magnesia, and alumina, united to silicic acid. Chevreul gives the following analysis:

Silica..... 59
Magnesia..... 25
Lime..... 9
Alumina..... 3
Water, iron, loss, etc..... 4

Total..... 100
The different analyses made by Thompson, Berthier, Schmidt, Delesse, and others, have given almost the same result.

PETROLEUM, of superior quality, has been found at Los Gatos.

easily when mixed with woolen or hemp. When taken from the loom the cloth is thrown into the fire to burn the vegetable fibers, the asbestos coming out unchanged. This process however makes a material of very coarse texture. In Siberia, they in some places manufacture purses, gloves, etc., of this substance. The Italians have manufactured cloth, paste-board and even a sort of lace from it. According to Sage they manufacture in China, sheets of paper six metres long and entire webs of cloth. A very valuable variety of it is found in Italy the threads of which are of a shining whiteness and have the peculiarity of seeming to be wound up in the mineral mass they form as the silk in the cocoon from which it is drawn. If one of the ends of these mineral fibers is seized it can be drawn out to a length eight or ten times the size of the piece from which it comes. The cloth made from it however presents little solidity. It is stated that an entire work was once printed on paper made from asbestos, and presented to the Institute of France by Madame Perpete.

The finer qualities of asbestos have been formed into gloves, neckties, etc., which can easily be cleaned by putting them in the fire. It has been highly recommended for firemen's hats, gloves, coats, etc. The uses to which it is put to any extent at present, are for lining fire proof safes, making roofing material and boiler filling, steam packing, making crucibles, fire bricks, filters, etc. The parties owning the mine spoken of above could only find a limited sale for the product to the manufacturers of safes. Mixed with tar it forms a cheap roofing material, which is so flexible that it is said not to shrink or be subject to fracture. In connection with oily materials it is said to form a valuable cement for leaky joints around windows, doors and chimneys. In steam boilers its non-radiating and non-conductive properties are utilized for the purpose of covering the boilers and pipes. As it is quite refractory and durable it will not decompose like felt and canvas. It is put on in a plastic form which soon solidifies and adheres to the iron with great tenacity. The coating is generally 1½ inches thick. A New York company is now using asbestos for this purpose, and have already four factories producing the material. If asbestos accomplishes all that is claimed for it in that line, which it probably will, it will no doubt be more generally in demand. The manufacturers referred to use a glutinous material to keep the asbestos together, the composition of which is kept secret. As a roofing material, no doubt more attention will be turned to it, since the large fires of the past few years.

As a packing, asbestos seems to be gaining in favor. A late exchange says that this packing in ocean-going steamers, put in more than sixteen months since, is still apparently as perfect as ever. The *Anglia*, one of the Anchor Line Trans-Atlantic passenger steamers made 14 trips to America and back, from England, having steamed in the same packing over 98,000 miles.

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American Inventive Genius.

There seems to be a peculiar disposition manifested among American mechanics and inventors to accomplish everything possible by automatic machinery. An observer in an American machine-shop or factory will see many things done by machinery here, which in other and older countries is done by hand. This fact is becoming very marked; but whether to the healthful advantage of mechanical progress or not, is not yet altogether clear.

This desire to carry machinery to the utmost limits of mechanical possibility, in the way of automatic action, not infrequently leads to complication in our machinery, a desire or necessity for building it too light—to crowd in the greatest number of movements and largest amount of efficiency, with the least weight of metal. This practice is made more urgent by reason of the higher price of labor here. Our inventive faculties are seeking to make us independent of cheap labor.

A California Invention—Hyde's Water-Power Attachment.

The little engraving, shown herewith, represents a machine which although simple in appearance and operation, is one which is rapidly effecting a great change in domestic circles. It is Hyde's Water power attachment for sewing machines. The evils attendant on the constant operation of the sewing machine by the treadle movement, are too well known to need comment by us. Physicians have agreed that the method usually employed is injurious to the health of females, and should be remedied. This little water power attachment is, as can be seen by the cut, quite simple. It can be attached to the table of the machine in such a manner as to offer no obstruction to the operator and in fact is rather ornamental than otherwise.

It consists of a neat iron water-case, about one foot in diameter which is attached to the side of the table. Within the case is a water wheel, modeled after the wheel ordinarily used in manufactories, and measuring eleven inches in diameter; two pipes connect with the case, one running from a point in the floor to the front side of the case and almost on a line with the center; and the other a waste pipe, leading from the rear end of the case to, and through, the floor. The volume of water, involving of course, the motive power of the machine, is controlled by the operator, who simply presses his foot on the iron sandal that is substituted for the treadle. The stream of water running upon the wheel is no larger than a darning needle, but it performs its work admirably, furnishing all the power required; the water passes a few inches in the bucket on the wheel and is then thrown off by centrifugal force; and passes down the waste pipe. An ordinary tank pressure of 20 feet, or the pressure of the city water pipes will move the machine at a high rate of speed, causing it to run 300 yards of cloth, while the ordinary operator would run 150 yards. The little water wheel only weighs six ounces.

The machine is operated as follows: The operator starts it by pressing upon the iron sandal with the front part of the foot. If a higher rate of speed is desired, increase the pressure, and so on until the required speed is reached. The speed is lessened by depressing the heel, and the machine can be started at full speed at once, or stopped immediately at will. The attachment is compact, the water is never seen, and the ease of working the machine with it is almost no work at all. In applying the attachment the wheel is fastened to the table of the sewing machine by wood screws or bolts. The foot-valve is placed beneath the table and screwed fast to the floor, and occupies the same position as an ordinary treadle. The pipes are connected with rubber or leather washers placed between the joints or couplings, and screwed tight. The waste water pipe connecting with the outlet of the machine must have sufficient fall to secure free drainage, otherwise the wheel will cease to operate. On cabinet machines the wheel can be placed under the table and connected by a belt. The attachments can be made with either rubber or lead pipe; if with rubber, the machine can be moved to any part of the room, according to the length of hose. The foot-valve must in that case be put upon a board,

with the sewing machine table resting upon it.

Messrs. Sawyer & Whedon, No. 633 Washington street, agents for this machine, inform us that they have lately applied it to other uses than driving sewing machines, and that it answers the purpose required admirably. One use to which it will probably be applied extensively, is in driving a dental tool known as Morrison's "Burring Engine," which is used for boring out cavities in teeth. This machine has usually been run by a treadle but an irregular movement was the consequence. Recently however, this little "attachment" has been applied in this city to run the "Burring Engine" with very satisfactory results. Boring teeth by water power may seem a strange idea, but it has nevertheless been put in practice successfully. The drilling and polishing is done as well as the excavating, and as quickly. By this means the dentist is able to move about in any direction, and to point the "hurr" to any particular place without any irregularity of movement in the instrument.

The agents are now applying it to small printing presses, jewelers and dentists, lathes, etc. In one jeweler's in this city a 1-16 inch nozzle entirely dispenses with two treadles, drives a polishing lathe 1,500 revolutions a minute and works at the same time a lapetone six feet distant. It is also used on a lathe at a prominent optician's and works beautifully for light turning, polishing and grinding. This little thing is a California invention, having



been patented through the agency connected with this office recently. For small manufacturing purposes where little power is required it is invaluable, and when once used can scarcely be dispensed with. It is being introduced quite extensively in this State, and will no doubt before long find its way to the East. The machine will materially lessen the doctors' bills in families, and be of great benefit to many ailing persons of the gentle sex. Its simplicity is apparent to the most casual observer.

The New Coal Land Law and Regulations Thereunder.

We give below the text of the bill in relation to the location of Coal Lands in the United States, which was passed at the last session of Congress, together with the full and complete rules and regulations by the Commissioner of the General Land Office for carrying the provisions of the law into effect.

[GENERAL NATURE—No. 107.]

AN ACT to provide for the sale of lands of the United States containing coal.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That any person above the age of twenty-one years, who is a citizen of the United States or who has declared his intention to become such, or any association of persons severally qualified as above, shall, upon application to the register of the proper land-office, have the right to enter, by legal subdivisions, any quantity of vacant coal lands of the United States not otherwise appropriated or reserved by competent authority, not exceeding one hundred and sixty acres to such individual person, or three hundred and twenty acres to such association, upon payment to the receiver of not less than ten dollars per acre for such lands, when the same shall be situated more than fifteen miles from any completed railroad, and not less than twenty dollars per acre for such lands as shall be within fifteen miles of such road.

Sec. 2. That any person or association of persons severally qualified as above, who have opened and improved, or shall hereafter open and improve, any coal mine or mines upon the public lands, and shall be in actual possession of the same, shall be entitled to a preference right of entry, under the foregoing provisions, of the mines so opened and improved: *Provided*, That when any association of not less than four persons, severally qualified as in section one of this act, shall have expended not less than five thousand dollars in working and improving any such mine or mines, such association may enter not less than one hundred and forty acres, including such mining improvements.

Sec. 3. That all claims under section two of this act must be presented to the register of the proper land district within sixty days after the date of actual possession and the commencement of improvements on the land, by the filing of a declaratory statement therefor: *Provided*, That the date of actual possession shall be the date of such improvement, filing must be made within sixty days from the receipt of such plat at the district office: *And Provided Further*, That where the improvements shall have been made prior to the expiration of three months from the passage of this act, sixty days from the expiration of said three months shall be allowed for the filing of a declaratory statement, and no sale under the provisions of this act shall be allowed until the expiration of six months from the date hereof.

Sec. 4. That this act shall be held to authorize only one entry by the same person or association of persons under its provisions; and no association of persons any member of which shall have taken the benefit of this act either as an individual or as a member of any other association, shall enter or hold any other lands under the provisions of this act; and no member of any association which shall have taken the benefit of this act shall enter or hold any other lands under its provisions, and

all persons claiming under section two hereof shall be required to prove their respective rights and claims for the lands filed upon and within one year from the time prescribed for filing their respective claims; and upon failure to file the proper notice, or to pay for the land within the required period, the same shall be subject to entry by any other qualified applicant.

Sec. 5. That in case of conflicting claims upon lands where the improvements shall hereafter be commenced, priority of possession and improvement, followed by proper filing and continued good faith, shall determine the preference right to purchase. And also where improvements have already been made at the date of the passage of this act, division of the land claimed may be made by legal subdivisions, to include, as near as may be, the valuable improvements of the respective parties. The Commissioner of the General Land-Office shall be, and is hereby authorized to issue all needful rules and regulations for carrying into effect the provisions of this act.

Sec. 6. That nothing in this act shall be construed to destroy or impair any rights which may have attached prior to its passage, or to authorize the sale of lands valuable for mines of gold, silver, or copper.

Approved, March 3, 1873.

Regulations Under the Law.

Your attention is called to the following points:

1. The sale of coal-lands is provided for—
1st. By giving priority of entry under section one.
2d. By granting a preference right of purchase based on priority of possession and improvement under section two.

2. The land entered under either section must be by legal subdivisions, as made by the regular United States survey; entry is confined to surveyed lands; to such as are vacant, not otherwise appropriated, reserved by competent authority, or containing valuable minerals other than coal.

3. Individuals and associations may purchase; if an individual, he must be twenty-one years of age and a citizen of the United States, or have declared his intention to become such citizen.

4. If an association of persons, each must be qualified as above.

5. A person is not disqualified by the ownership of any quantity of other land, nor by having removed from his own land in the same State or Territory.

6. Any individual may enter by legal subdivisions as aforesaid any area not exceeding one hundred and sixty acres.

Any association may enter not to exceed three hundred and twenty acres.

8. Any association of not less than four persons duly qualified, who shall have expended not less than \$5,000 in working and improving any coal mine or mines, may enter under section two not exceeding six hundred and forty acres, including such mining improvements.

9. The price per acre is \$10 where the land is situated more than fifteen miles from any completed railroad; and \$20 per acre where the land is within fifteen miles of such road.

10. Where the land lies partly within fifteen miles of such road, and in part outside such limit, the maximum price must be paid for all legal subdivisions, the greater part of which lies within fifteen miles of such road.

11. The term "completed railroad" is held to mean one which is actually constructed on the face of the earth; and lands within fifteen miles of any point of a railroad so constructed will be held and disposed of at \$20 per acre.

12. Any duly qualified person or association must be preferred as purchasers of those public lands on which they have opened and improved, or shall open and improve, any coal mine or mines, and which they shall have in actual possession.

13. Possession by agent is recognized as the possession of the principal. The clearest proof on the point of agency must, however, be required in every case, and a clearly defined possession must be established.

14. The opening and improving of a coal mine, in order to entitle a purchaser to purchase, must be considered as a more matter of fact; the labor expended and improvements made must be such as to clearly indicate the good faith of the claimant.

15. These lands are intended to be sold where there are adverse claimants therefor to the party who by substantial improvements, actual possession and a reasonable industry, has established his claim; and his development of the mines in preference to those who would purchase for speculative purposes only. With this view, you will require such proof of compliance with the law, when lands are applied for under section two, by adverse claimants as the circumstances of each case may justify.

16. In conflicting claims, where improvement has been made prior to March 3, 1873, you will, if each party make subsequent compliance with the law award the land by legal subdivisions as to secure to each as far as possible, his valuable improvements; there being no provision in the act allowing a joint entry by parties claiming separate portions of the same legal subdivision.

17. In conflicts when improvements, etc., have been commenced subsequent to March 3, 1873, or shall be hereafter commenced, priority of possession and improvement shall govern the award when the law has been fully complied with by each party. A mere possession, however, without satisfactory improvements, will not secure the tract to the first occupant when a subsequent claimant shows his full compliance with the law.

18. After an entry has been allowed to one party, you will make no investigation concerning it at the instance of any person, except on instructions from this Office. You will, however, receive all affidavits concerning such case, and forward the same to this Office, accompanied by a statement of the facts as shown by your records.

19. Prior to entry it is competent for you to order an investigation, on sufficient grounds set forth under oath of a party in interest, and substantiated by the affidavits of disinterested and credible witnesses.

20. Notice of contest, in every case where the same is practicable, must be made by reading it to the party to be cited and by leaving a copy of this notice in the hands of the proper land-office and be signed by the register or receiver. Where such personal service cannot be made by reason of the absence of the party, and because his whereabouts are unknown, a copy may be left at his residence, or if this is unknown, by posting a copy in a conspicuous place on the tract in controversy, and by publication in a weekly newspaper having the largest general circulation in the vicinity of the land, (where no newspaper shall be specified by this Office,) for five consecutive insertions, covering a period of four weeks next prior to the trial; and in each case requiring such notice, a copy must be forwarded with the returns of this Office, accompanied with proof of service by affidavit indorsed thereon.

21. In case of contest, all papers in the same must be forwarded to this Office for review before an entry is allowed to either party.

22. Thirty days from your decision will be allowed by you to enable any party to take an appeal, or file argument to be forwarded to this Office.

23. No appeal will be entertained unless the same shall be forwarded to the district land-office.

24. The party may still further appeal from the decision of the Commissioner of the General Land-Office to the Secretary of the Interior. This appeal must be taken within sixty days after service of notice on the party. This may be filed with the district land-office and by them forwarded, or it may be filed with the Commissioner, and must recite the points of exception.

25. If not appealed, the decision is by law made final. (See section 10, act June 12, 1858, United States Statutes, volume 11, page 326.) After appeal, thirty days are usually allowed for filing arguments, and the case is then sent to the Secretary, whose decision is final and conclusive.

26. Manner of obtaining title: First, by private entry. The party will present the following application to the register, and will make oath to the same:

I, _____, hereby apply under the provisions of the

act approved March 3, 1873, entitled "An act to provide for the sale of the lands of the United States containing coal," to purchase the _____ quarter of section _____, in township _____ of range _____, in the district of lands subject to sale at the land-office at _____, and containing _____ acres, and I solemnly swear that no portion of said tract is in the possession of any other party; that I am twenty-one years of age, a citizen of the United States, (or have declared my intention to become a citizen of the United States), and I have never held nor purchased lands under said act, either as an individual or as a member of an association; and I do further swear that I am well acquainted with the character of said described land, and with each and every legal subdivision thereof, having frequently passed over the same; that my knowledge of said land is such as to enable me to testify understandingly with regard thereto; that there is not to my knowledge within the limits thereof any vein or lode of gold or silver, or copper, and that there is not within the limits of said land to my knowledge any valuable mineral deposit other than coal. So help me God.

To this affidavit the register will append the usual jurat.

27. Thereupon the register, if the tract is vacant, will so certify to the receiver, stating the price, and the applicant must then pay the amount of this purchase-money.

28. The receiver will then issue to the purchaser a duplicate receipt, and at the close of the month the register and receiver will make returns of the sale to the General Land-Office, from whence, when the proceedings are found regular, a patent or complete title will be issued; and on surrender of the duplicate receipt such patent will be delivered, at the option of the purchaser, either by the Commissioner at Washington, or by the register at the district land-office.

29. This disposition at private entry will be subject to any valid prior adverse right which may have attached to the same land, and which is protected by section 2.

30. Second. When the application to purchase is based on a priority of possession, &c., as provided for in section 2, the claimant must, when the township plat is on file in your office, file his declaratory statement for the tract claimed within sixty days from and after the first day of his actual possession and improvement. Sixty days, exclusive of the first day of possession, &c., must be allowed.

31. The declaratory statement must be substantially as follows, to wit:

I, _____, being _____ years of age, and a citizen of the United States, (or having declared my intention to become a citizen of the United States), and never having, either as an individual or as a member of an association, purchased or obtained title to any land under said act, approved March 3, 1873, entitled "An act to provide for the sale of the lands of the United States containing coal," do hereby declare my intention to purchase, under the provisions of said act, a quarter of section _____, of township _____, of range _____, of lands subject to sale at the district land-office at _____, and that I came into possession of said tract on the _____ day of _____, A. D. _____, and have ever since been in actual possession, and have expended in labor and improvements on said mine the sum of _____ dollars, the labor and improvements being as follows: (here describe the nature of the improvements, and I do furthermore solemnly swear that I am well acquainted with the character of said described land, and with each and every legal subdivision thereof, having frequently passed over the same; that my knowledge of said land is such as to enable me to testify understandingly with regard thereto; that there is not to my knowledge within the limits thereof any vein or lode of gold or silver, or copper, and that there is not within the limits of said land, to my knowledge, any valuable mineral deposit other than coal.)

32. When the township plat is not on file at the date of claimant's first possession, the declaratory statement must be filed within sixty days from the filing of such plat in your office.

33. When improvements shall have been made prior to June 4, 1873, the declaratory statement must be filed within sixty days from that date.

34. No sale under this act will be allowed by you prior to September 4, 1873. One year from and after the expiration of the period allowed for filing the declaratory statement is given to the claimant to make proof and payment, but you will allow no party to make such proof and payment, except on notice as aforesaid to all others who appear on your records as claimants to the same tracts.

35. A party who otherwise complies with the law may enter after the expiration of said year, provided no valid adverse right shall have intervened. He postpones his entry beyond said year at his own risk, and the Government cannot thereafter protect him against any person who complies with the law, and the value of his improvements can have no weight in his favor.

36. One person can have the benefit of one entry or filing only. He is disqualified by having made such entry or filing alone, or as a member of an association. No entry can be allowed an association which has in it a single person thus disqualified, as the law prohibits the entry or holding of more than one claim, whether by an individual or an association. You are to allow no entry under this act of lands containing other valuable minerals. You will determine the character of the land under the present rules relative to agricultural and mineral lands. Those that are sufficiently valuable for other minerals to prevent their entry as agricultural lands, cannot be entered under this act.

37. Assignments of the right to purchase under this act will be recognized when properly executed. Proof and payment must be made, however, within the prescribed period, which dates from the first day of the possession of the assignor who initiated the claim.

38. You will so construe this act in its application as not to destroy or impair any rights which may have attached prior to March 3, 1873. Those persons who may have initiated a valid claim under any prior law relating to coal-lands will be permitted to complete their entries under the same.

39. You will report at the close of each month as "sales of coal-lands" all filings and entries under this act in separate abstracts, commencing with number one, and thereafter proceeding consecutively in the order of their reception. Where a series of numbers has already been commenced by sale of coal-lands, you will continue the same without change. The affidavit required from each claimant under Sec. 2, at the time of actual purchase will be as follows, to wit:

I, _____, claiming the right of purchase under the act of Congress entitled "An act to provide for the sale of the lands of the United States containing coal," approved March 3, 1873, to the _____ quarter of section _____, in township _____ of range _____, subject to sale at _____, do solemnly swear that I have never had the right of purchase under said act, either as an individual or as a member of an association; and that I have never held any other lands under its provisions; I further swear that I have expended in developing coal-mines on said tract in labor and improvements the sum of _____ dollars, the nature of such improvements being as follows: (that I am now in the actual possession of said mines, and make the entry for my own use and benefit, and not directly or indirectly for the use and benefit of any other party; and I do furthermore swear that I am well acquainted with the character of said described land, and with each and every legal subdivision thereof, having frequently passed over the same; that my knowledge of said lands is such as to enable me to testify understandingly with regard thereto; that there is not to my knowledge within the limits thereof any vein or lode of gold or silver, or copper, and that there is not within the limits of said land, to my knowledge, any valuable mineral deposit other than coal. So help me God.)

40. Of the land-office at _____, do hereby certify that the above affidavit was sworn and subscribed to before me this _____ day of _____, A. D. 18____.

41. In case the purchaser shows by an affidavit that he is not personally acquainted with the character of the land, and that he has not obtained any such knowledge as may be required by the law as to its character; but whether this affidavit is made by principal or agent, it must be corroborated by the affidavits of two disinterested and credible witnesses having knowledge of its character.

WILLIS DRUMMOND, Commissioner.
To Registers and Receivers,

The Lignites of Ione Valley and Lancha Plana—Combustion.

[Written for the Press.]

While in Amador county on two recent occasions, the writer of this, noticed at quartz mills, the attempt to burn the above fuels, but the mill-men did not express satisfaction at their use—quite otherwise. To have explained to them satisfactorily why, involved such an acquaintance with the chemistry of combustion and mechanical arrangements of the furnace and boiler setting that I forbore on that occasion. In that county fuel is scarce and high—\$6 for wood—and so if this fuel can be availed of profitably, it will be a source of profit and commerce to all parties.

What is combustion? This question involves another—what is fuel or carbon and its relation to heat? Carbon is deemed an element, and the plant, through its living organization, gathers it from the earth and the air and stores it up as growth or woody fibre. But with it, as evidently a part of the Divine economy, is also stored up heat. Now if we want that heat we apply active flame to woody fibre, and the operation is, first, to add to the volatile part of the dry wood—the hydro-carbon—oxygen, and if it be furnished in sufficient quantity, then the hydro-carbon is decomposed, the hydrogen, from its greater affinity for oxygen than for its associate carbon, unites with oxygen from the atmosphere, and forms water—a cord of wood yielding it is estimated, half a ton of water—and the carbon unites with oxygen, if it be furnished in sufficient quantities and proper time and opportunity be afforded it, forming firstly, carbonic oxide and secondly carbonic acid.

Now it must be borne in mind that all the heat is not liberated until carbonic acid is formed, which acid is the result of the full and complete union of carbon and oxygen.

In other words, then, combustion may be considered to be the distillation of heat from carbon, which heat cannot be so liberated except under proper chemical conditions.

Now the fuels in question consist of hydro-carbon, fixed carbon, silica, alumina and water.

In order to effect the combustion, economically, of these soft coals—especially these lignites—Mt. Diablo, Coarse Bay, Rocky Mountain and other like soft coals, our boilers must be set in accordance with the principles of sound mechanics and chemistry, otherwise great loss must inevitably result therefrom.

While at Virginia City and Gold Hill, recently, this matter struck me forcibly as I stood before the furnaces at various mines and mills and observed construction of boilers, setting, etc.

On looking into the furnaces I found that without one single exception they were so set as to unavoidably lose 20 to 33 percent. of fuel, but mere words would not clearly explain the matter, so I forbore.

For locomotives on railroads much loss must necessarily and unavoidably be endured; but on the land it is entirely unnecessary, and therefore unpardonable. I may pursue this matter in another communication hereafter.

ENGINEER.

San Francisco, June 14, 1873.

PERUVIAN MINES.—In an interview with Mr. Evans, of Peru, a New York *Sun* reporter elicited the following with regard to mines and expenses in that country: The people there are accustomed to pay well for accommodations. I have given \$3 there for watering my horse. I dined once in Peru with some gentlemen who owned mines. I said, "I don't see how you can afford to work your mines at so much expense." "Expense," they replied, "don't amount to much, when you find things like that laying around," and they showed me several lumps of silver.

With regard to the value of the guano yet remaining, Mr. Evans declined to give any opinion. He also refused to say anything as to the way in which the Peruvian Government is carried on. Of the prosperity of Peru, he said: "Too much prosperity will hurt a people as much as adversity. Gold and silver will ruin a people quicker than anything in the world. My belief is that there is eternal wealth in Peru. When I was building the Tanga road, an Indian used to come down from the mountains once a year with a lump of gold worth \$5,000. He would sell it, buy goods for his village and depart. Attempts to discover where he obtained the gold were vain. In another instance an Indian lady was found wrapped in a shawl of beaten gold. There are mines of silver and gold in Peru only waiting for Yankee ingenuity and Yankee pluck to work them.

A NEW INDUSTRY AT ALASKA.—A correspondent of the New York *World*, writing from Sitka, states that a new enterprise—that of ship building—has sprung into existence there, which promises to be of some importance in the future. Two small vessels have been constructed for local use, and larger ones are on the stocks for the San Francisco coasting trade. It is also claimed that the timber of Alaska is admirably suited for ship-building purposes. So far the vessels constructed have been the work of Russian mechanics, who have remained at Sitka, but the field is widening so that American artisans may hereafter find employment.

Borax Fields in Esmeralda County.

From W. J. Westersfield, Freight Agent at this point for the Virginia and Truckee Railroad Company, a thoroughly reliable gentleman, who recently paid a flying visit to the borax fields of Esmeralda county, we learn the following interesting facts in regard to the new wagon road from Carson to Columbus, and touching the wealth of the new borax fields opened up in the southern portion of Esmeralda county:

The road from Carson to Aurora, a distance, so called, of 110 miles, runs a little east of south, and is one of the best wagon roads in the State, well supplied with wood and water. An abundance of hay is cut and put up in the valleys adjacent to the road, and is sold at very reasonable rates. The town of Aurora presents a dilapidated appearance at present. No mines are being worked and hence none of the mills are in operation. The town contains two grocery stores, a drug store, livery stable, one saloon, a butcher shop and a hotel. The major portion of the merchandise shipped to the vicinity is teamed from Reno, simply because there is no forwarding house at Carson to attend to business for the southern country. Bishop Creek, 60 miles south of Aurora, also demands the establishment of a forwarding house at Carson, and we believe D. W. Earl will open one in a few days.

About eight miles north of Aurora, or 100 miles from Carson, is the junction of the Aurora and the proposed new toll road to Columbus, the distance from the junction to the last named town and district being estimated at from 50 to 55 miles. The road bears a little south of east. From this junction to first water is seven miles; next water, seven miles—to which point, over a nearly level table land country, the new road is completed. Here the first range of mountains, about eight miles across, presents the first barrier and greatest obstacle on the route. The mountains are of granite formation, high and rugged, the cañons through which the road must pass on both sides of the summit being deep and rough. Angus McLeod, Superintendent of construction, estimates the cost of building the road across this range at from \$7,000 to \$8,000, while others think the cost will reach \$12,000. From the eastern base of this first range, or the mouth of Whisky Cañon, the road passes six miles over a level plain to the mouth of a cañon leading to the summit of the second range, over which is a comparatively easy grade and an almost natural grade, so much so that light vehicles now pass over in safety. Ten or twelve miles across this range of mountains brings us to Teal's marsh, which is said to be the best and richest borax deposit in the country, a description of which will be given hereafter. From Teal's marsh to Columbus, the distance by the present traveled route is 20 miles, over a good road, (excepting a 3-mile stretch of sand, which will hereafter be avoided), but this will be shortened to 16 miles. The people of Columbus purpose building a good road to the mouth of Whisky Cañon, at a cost of about \$3,000, and are now at work upon it. This road is being built for the purpose of turning the tide of freight to Carson instead of Wadsworth, and to shorten and improve the road over which the constantly increasing borax yield and general supplies must pass.

This road, when completed, will possess many advantages over the one now in use between Wadsworth and Columbus, and can reasonably be expected to turn the trade of the southern country into Carson. The distance from Wadsworth to Columbus is 150 miles, over a very sandy and desert country, with a great scarcity of water and feed for stock. Water has to be hauled from station to station, one drive along being forty miles over heavy sand. Across this desert water must be hauled, and a fourteen-mule team will consume 3,000 pounds of water while crossing, and merchandise freight over the whole distance from the railroad to Columbus, must give place to this necessary but unpaid-for freight. Twenty-six to thirty days is required to make the round trip over the Wadsworth route, and hay is \$80 per ton. Freight charges from Wadsworth to Columbus on merchandise and all material, is four cents per pound; returning, freight on borax, by contract, three and a half cents per pound, otherwise four cents. Between thirty and thirty-five teams are now on the road, and this number is not able to do the amount of work required.

Teal's Marsh

Contains 1,000 acres of borax land by actual survey. The estimated amount of crude borax on this survey is 300,000 tons, or 75,000 tons of net borax. One set of works in full operation on this marsh has a boiler 12x15, two feet deep, and 13 tanks in which borax is manufactured; and these turn out two tons of concentrated borax daily, or sixty tons per month. These works are owned by J. Mosshimer & Co. Smith & Co. are erecting works capable of concentrating eighty tons per month, and these will be in operation in July. Nadeau & Co. have bought 500 tons of the material on this marsh, most of which is already sacked and will be shipped in its natural state. Other works are to be erected at an early day. All the borax from this marsh will come over the new road to Carson, as it is twenty miles

further from Teal's to Wadsworth than to Carson, to say nothing of the other disadvantages of the former route. The upper end of this marsh contains one of the finest deposits of salt known to exist anywhere, and it is believed that this marsh alone will ship at least 200 tons of borax per month.

Columbus Borax Marsh

Is situated about 150 miles south of Carson, and about the same distance from Wadsworth. Four manufacturing companies are at work upon the marsh. The Pacific Company is making fifty tons of borax per month. Hearn's steam works started up on the 10th of last month. Capacity, 140 tons per month. This company will require twenty-five hands, and employ 150 animals daily to do their hauling.

Columbus

Has a population of 500, in 125 houses, most of concrete or adobe; three grocery stores, six saloons, two livery stables, one hay yard, two blacksmith shops, one butcher shop, one stationary store and news depot, and two quartz mills. Columbus is also the distributing point for Alida Valley, Gold Mountain, Death Valley and other districts south. One quartz mill is now running at Gold Mountain and another is being erected, while extensive deposits of borax have recently been found and located at two or three different points in Death Valley, about 70 miles south of Gold Mountain. All freight forwarded to or from these districts, for over 100 miles south of Columbus, will pass over the new Carson road when completed.

Borax Yield.

Below will be found an estimate of the amount of borax that will be shipped from these southern districts, monthly:

From Columbus Marsh, 220 tons.
From Fish Lake Valley, 120 tons.
From Rhoad's Marsh, 300 tons.
From Teal's Marsh, 240 tons.

By this statement it will be seen that the estimated monthly shipment of borax alone will be 880 tons, to say nothing of the large prospective increase in the production of this material and the general supplies necessary to carry on operations. These facts indicate unmistakably that our southern neighbors have a "big thing," and we should not be surprised to hear at any time that they were to be connected with Carson by rail.—*Virginia Chronicle*.

White Pine Mines.

The editor of the White Pine *News* was treated to a buggy ride by Morris Ballenberg, the other day, and visited Eberhardt, Treasure City and Shermantown. At Eberhardt the Stanford mill is in constant operation, and the sound of its stamps can be heard for a considerable distance. It is now being run by Dr. Goodfellow on ores from the Eberhardt & Aurora Company's mines. Workmen are engaged in clearing away the debris at the International mill site, and making preparations for the reception of the new structure. The people in town are confident of good times when the work of construction shall commence. Proceeding around the foot of Treasure Hill we arrived at Shermantown, passing on the way the deserted remains of the Little Giant, Kohler and Metropolitan mills, the sound of whose stamps once gladdened the ears of the numerous residents then in the vicinity. Shermantown presents a spectacle of gloomy desolation equalled only by the description given by Goldsmith of the "deserted village." Only one source of industry now remains for the residents, some six in number, and that is the small mill used by J. B. Osborne to run through the immense quantity of tailings left from the former workings of the Oasis and Eberhardt mills. We are informed this latter enterprise has not been successful thus far, from the fact of want of appliances to run through sufficient quantities of tailings during the twenty-four hours. However, the works are to be reconstructed and placed in thorough running order, when another start will be made.

On the way to Treasure Hill we pass more ruined structures, which were once the scenes of busy industry in smelting and mining. Our thoughts naturally recur to the times when money was plentiful and everybody was prospectively wealthy, and we cannot but think the day will yet come when the mountains surrounding the present waste will yield up the treasure hidden within their rugged sides. Treasure Hill, however, dispels much of the gloom which the view at Shermantown has left upon us, and we are again reassured by the signs of labor and life. The mines of the Ward Beecher Consolidated, Hidden Treasure and the English Company are all looking well and daily producing large quantities of mineral. The Peerless chamber, particularly, still keeps up its ore-producing reputation, and continues to supply the Stauford mill with sufficient to keep it running. Many other localities are being worked on the Hill and vicinity, mostly by private individuals and miners owning their own claims. We had not time to visit any of them, but are told the owners are confident of making a good thing the present season. Taken altogether we can see nothing discouraging in the appearance of White Pine District as it stands to-day. True there are mills standing idle, but men are at work extracting ore which must soon be crushed; then we have had a hard and long siege of dullness, and it will take some time to recover entirely from the effects of the black eye received in days gone by.

Utah Investments.

Whatever may be said of mining property as an investment, this one proposition cannot be denied, that to a very great extent, every investment in land, railroads, manufacturing and general business, depends upon the success of mining. The present limited development of mining as a legitimate business, has increased already to a wonderful extent the value of every kind of real and personal property in the Territory. Among the substantial men in the Eastern States, mining has always been and is now considered as a wild speculation. The frauds that have been connected with mining operations, the enormous outlays of money on valueless property, and the misrepresentations of unprincipled men in times past, makes it today, almost an impossibility to get an investor who has never before invested. Iron and lead mining in Pennsylvania, has become as legitimate as any business carried on in the State, and these interests, have no doubt, done more for the State's welfare than all the other interests combined. Of course the business is now thoroughly understood, and undertakings of every kind connected therewith, are gone into with as much confidence as any other branch of commerce or industry. The condition of things a few years ago, favored the sharper who desired to fleece the unsuspecting; traveling facilities were comparatively limited, and the men of business or large means in the East, could not spend the necessary time to visit and inspect the property for himself, and were in consequence dependent upon the representations made, or the judgment of experts in the interests of the seller. Oftentimes, enterprises of great magnitude were undertaken with too small a capital, and after struggling awhile, been abandoned or neglected, until they have actually passed out of the hands of the original owners, and some of this kind of property is of great value, and would have proved remunerative if it had been properly prosecuted.

Nevada became a prosperous mining Territory under the greatest disadvantages. The district of Pioche suffered in a large increase of cost of every article necessary for a mining camp; labor was scarce and commanded an exorbitant price. At Virginia City, flour has been as high as one hundred and twenty dollars per barrel, almost everything in different states of the market have been equally as high. While there is a risk in all kinds of business, we think the state of things now existing in Utah, makes mining investments made with caution and with good practical judgment, as safe as any investment that can be made. We have an agricultural country already well developed, water in abundance, timber plentiful, and we have a community of business men that are determined to frown and discountenance any attempt at fraud; labor is to be had at all times, at fair living wages, transportation is gradually growing cheaper, manufacturing are being rapidly established, good prospects are to be purchased at low figures, and we cannot see any good reason why these investments should not be sought after and made extensively profitable.

Our Wheat Product

The Sacramento *Record* in estimating the product of the coming harvest gives the following table, the figures for which are mainly made up from circulars sent to prominent men in the different counties named:

COUNTY.	1872-3.		1873-4.	
	Acres.	Yield Centsals.	Acres.	Estimated Yield.
Alameda....	58,000	407,000	58,000	408,000
Butte.....	45,500	280,000	50,000	30,000
Columbia....	100,000	600,000	115,000	517,000
Contra Costa	52,000	311,000	57,000	342,000
El Dorado....	8,500	87,000	10,000	50,000
Fresno.....	10,500	74,000	20,000	110,000
Kern.....	5,000	35,000	5,000	37,000
Lake.....	4,000	19,000	4,000	24,000
Marin.....	2,000	11,000	3,000	21,000
Mendocino....	7,000	35,000	9,000	53,000
Merced.....	200,000	1,400,000	250,000	1,200,000
Monterey....	155,000	1,331,000	170,000	1,190,000
Napa.....	31,500	157,000	33,000	231,000
Placer.....	16,000	95,000	20,000	100,000
Sacramento..	8,500	51,000	10,000	45,000
San Joaquin..	136,000	1,303,000	225,000	1,252,000
San Mateo....	35,000	210,000	35,000	210,000
Santa Clara..	142,500	855,000	142,000	810,000
Santa Cruz...	8,000	45,000	10,000	110,000
Siskiyou....	7,500	45,000	10,000	50,000
Siskiyou....	8,000	45,000	8,000	40,000
Solano.....	340,000	1,701,000	350,000	1,635,000
Sonoma.....	102,500	512,000	135,000	910,000
Stanislaus...	340,000	2,125,000	490,000	1,200,000
Sutter.....	80,000	360,000	75,000	415,000
Tehama.....	60,000	339,000	65,000	360,000
Tulare.....	11,500	81,000	30,000	105,000
Tuolumne....	5,000	30,000	6,000	35,000
Yolo.....	70,000	420,000	8,000	410,000
Yuba.....	13,000	80,000	13,000	58,000
S. Barbara...	9,000	54,000	10,000	70,000
Total.....	2,114,000	12,701,000	2,448,000	13,239,000

SINGULAR DISCOVERY OF A RICH LEDGE.—The *Silver State*, Humboldt county, publishes the following account of a singular discovery of a rich ledge: A few days since a horse used at the hoisting works at the Butte mine, while being led by a Chinaman, fell in an incline shaft and broke his neck. For sanitary reasons and a sensitiveness of the olfactory nerve, they concluded to bury the carcass. In digging a hole for that purpose, a rich ledge was discovered, and the horse found a grave elsewhere. There is now an active demand for Chinamen to drive horses at the Rye Patch,

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A Sewing Machine
of Real Value
(Beckwith's)
given for \$40
worth of Sub-
scriptions.

The AMERICAN AGRICULTURIST, in speaking of this Machine, says:

We are prepared to endorse the Beckwith Sewing Machine as one worthy of being at once acquired by all who cannot purchase the expensive machine.
1st. It is well and strongly made.
2d. It is easily attached to any table or stand having a leaf or edge projecting an inch or so, and can thus be used in any part of the house, near a window, etc.
3d. It makes the elastic loop stitch (the same as the Willcox & Gibbs and some other good machines), which with a little care in making the close and tight stitches, will give for nearly all kinds of sewing, and less liable to break in washing and wearing, owing to its elasticity.

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For \$40, we will give a Machine and \$40 worth of subscriptions to either paper, or all jointly at regular rates. Send for Circular.

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HALLIDIE'S
Patent Endless Wire Ropeway.
Covered by Numerous U. S. Patents.

IMPORTANT TO

Mining Companies, Civil Engineers, Contractors, Etc.

The system of transporting material, such as Ores, from the mine to the mill, Earthen embankments, Rock from quarries, etc., by means of steel wire rope, has been well tested and found more economical, advantageous and reliable than any other method of transportation; and to the annexed certificates in connection therewith I beg to call the attention of those interested to:

EUKEKA, Nevada, July 10, 1872.
T. M. MARTIN—My dear sir: On your leaving for San Francisco, it gives me great pleasure to hand you my written acceptance of the HALLIDIE TRAMWAY put up by you upon our mine in Freiberg.

It is a perfect success, discharging ten tons of ore per hour with two men's labor. It is perfectly simple in construction, and, as far as I can judge, there is nothing about it to ever get out of order—nothing to wear out. While ours requires but about two thousand five hundred feet of wire rope, I can see no reason why the line could not be extended almost indefinitely with equally happy results. Again, the carrying capacity might be doubled or quadrupled if desired. After several weeks trial upon our mine, the unanimous verdict of all who have seen it is a complete, unquestioned success. If this can be of any service to you, use it in any way you think proper. Very respectfully, C. O. GOODWIN.

EMMA HILL CONSOLIDATED MINING CO.,
Little Cottonwood, Utah.
Superintendent's Office, Sept. 23, 1872.
T. M. MARTIN, Esq., San Francisco.
The HALLIDIE'S PATENT Ropeway for the Emma Hill Consolidated Mining Company, has been built in a most substantial and workmanlike manner, and is at this time in splendid working condition. I most cheerfully accept the work for the company, and recommend it to others wishing a safe and speedy transit for ores over places impracticable for wagon roads, etc. Respectfully,
L. W. COLBATH, Superintendent.

"The Vallejo works smoothly with the elevated wire tramway, which carries its load of ore as quietly and easily as if there was no winter or snow in the world."
Whatever the objections to wire tramways may be on account of the cost, I have seen nothing yet that even approaches them in the facilities they afford for moving ore at all seasons of the year. —Correspondent Utah Mining Journal, Alta, Jan. 8, 1873.

The Vallejo Ropeway.

The Vallejo Tunnel Company's Tramway in Little Cottonwood, built on the HALLIDIE PATENT PLAN, is a complete success. It is between 2,300 and 2,400 feet in length, and is supported by thirteen stations. The fall in this distance is about 600 feet, and the wire rope, which is three-fourths of an inch in diameter, will safely and easily deliver one hundred tons in six hours. The machine is automatic, loading and unloading the sacks or buckets. About one ton and a half can be sent down at one time. The stations are about two hundred feet apart, and the entire apparatus is strong and safe. As the wire rope is elevated about forty feet above the surface of the hill, the Tramway can be worked all winter long, without the slightest trouble. —Utah Mining Journal, Salt Lake, Sept. 23, 1872.

Mining Companies and others desiring to negotiate for the erection of this system of Ropeway, can communicate with me personally, or through Postoffice Box 943.

A. S. HALLIDIE, Patentee,
112 and 114 California Street, San Francisco.

For hoisting from mines, transmitting power, ship rigging, etc., of all kinds and sizes, on hand and made to order.
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For hard and wet Rock, Iron, Copper, etc., and Submarine Blasting.

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For medium and seamy Rock, Lime, Marble, Sulphur, Coal, Pipe Clay and Gravel Bank Blasting, Wood, etc.
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PATENTS & INVENTIONS.

Telegraphic List of U. S. Patents Issued to Pacific Coast Inventors.

FROM OFFICIAL REPORTS FOR THE MINING AND SCIENTIFIC PRESS, DEWEY & CO., PUBLISHERS AND U. S. AND FOREIGN PATENT AGENTS.]

By Special Dispatch, Dated Washington, D. C. June 24th, 1873.

FOR WEEK ENDING JUNE 10th, 1873.

ELECTROLYTIC GAS LIGHTING APPARATUS.—John Vansant, S. F., Cal.

COOKING RANGE.—James H. Mitchell, S. F., Cal.

EXPLOSIVE COMPOUND.—Thomas Varney, assignor to the Giant Powder Company and the Atlantic Giant Powder Company, S. F., Cal.

The patents are not ready for delivery by the Patent Office until some 14 days after the date of issue. NOTE.—Copies of U. S. and Foreign Patents furnished by DEWEY & CO., at the lowest rates. All patent business for Pacific coast inventors transacted with greater security and in much less time than by any other agency.

Old Tuolumne.

The annual reunion of the Tuolumne Reunion Association, composed of residents and ex-residents of Tuolumne county, was held in Brooklyn, Alameda county, on the 17th inst. As usual, the picnic passed off pleasantly to all concerned. These annual gatherings of old friends and acquaintances are much enjoyed by the participants, and they propose to keep them up indefinitely. A great register is kept of all the old residents of the county, in which are as many original signatures as can be obtained. Placer county is the only other one that has as yet followed the example of Tuolumne in this matter, two "Placer Reunions" having been held. It is pleasant to see men who have "roughed it" together in early days, join together with those who have come in later years to keep up old associations and remembrances in an annual reunion. We give below the officers elected by the Association for the ensuing year:

President L. P. McCarty (of the MINING AND SCIENTIFIC PRESS), San Francisco. Vice-President, C. B. Rutherford, Oakland. Secretary, Thornton Westley, San Francisco. Treasurer, W. G. Dinmore, Oakland. Executive Committee, James L. Homer, H. M. Rose, L. Jacob, Hon. Stephen Wing, all of San Francisco.

Committee at Large, (San Francisco), John Sedgwick, J. H. Scammon, Alden Kingman, O. Becker, P. R. Woodman, Wm. H. Culver, A. Sharp, John S. Cannon, Oakland.—E. G. Jones, Samuel Boynton, P. Emon, Stockton.—J. B. Douglass, R. C. Patten, Le Rose Phelps, Hon. Geo. S. Evans, Colonel Wm. Sabine.

Visalia.—James Spear. Vallejo.—Hon. Paul K. Hubbs. San Jose.—Nep. S. derer, Walter Hollenbeck. Salinas City.—Henry Harter, George A. Tolman. Columbia.—Hon. P. B. Bacon. Sonoma.—D. M. Kenfield, J. B. Bacon. Martinez.—W. H. Ford.

Antioch.—Wm. Stewart. San Diego.—Joseph A. Smith. Marysville.—F. W. A. Aaron. Petaluma.—B. Harter. Carson, Nevada.—D. C. Turner. Virginia City, Nevada.—Joseph Smith. San Luis Obispo.—Walter Murray.

Lone Pine.—Tim Lewis. Hamilton, Nevada.—Dan Patterson. San Andreas.—Hon. Wm. T. Lewis. Helena.—Wm. A. Chesman. Los Angeles.—B. F. Ryder. Santa Cruz.—Judge Wellington. Eureka.—John H. Fordham. Confidence Mine, Tuolumne County.—L. Gileon. Gold Springs.—J. B. Robbins.

Big Oak Flat.—Wm. Ulrich. Obispo Camp.—M. Bacon, Judge Oallinridge. Napa.—John F. Zollner. Montezuma.—D. J. Edgar. Mount Springs.—W. J. Flack. Pioche.—Barney Mullen. Jacksonville.—Dan Munn. Silver City.—Mike Maxwell.

New Incorporation.

The following companies have filed certificates of incorporation in the County Clerk's Office, S. F.:

QUINTERO M. Co., June 23. Location: Sonora, Mexico. Capital stock, \$5,000,000, in shares of \$100 each. Trustees—J. D. Fry, Thomas Findley, G. D. Roberts, S. Haydenfeldt, and John F. Boyle.

MONO M. Co., June 25. Utah Territory. Trustees—David D. Colton, Jesse Holladay, Chauncey B. Land, John W. Galloway, John D. Fry. Capital stock, \$5,000,000 in shares of \$100 each, all of which has been subscribed.

CALIFORNIA SAVINGS AND LOAN SOCIETY, June 25. Object: accumulating savings and loaning the funds of members, stockholders and depositors. The place of business is in this city and county. Trustees—John Bell, Charles Lux, A. O. Corbett, James K. Kelly, Frederick July, Julius C. Reis, Adolph Wecker, Alexander G. Able, Alexander Austin, Robert Ewing. Capital stock, \$300,000, in 300 shares of \$1,000 each, all of which has been subscribed.

Meetings and Elections.

IMPERIAL S. M. Co., June 24. Trustees: A. K. P. Harmon, J. D. Fry, H. O. Kibbe, H. O. Dickinson, William Norris, Alpheus Bull and Thomas Bell, W. E. Dean, Secretary; O. C. Batterman, Superintendent.

INCREASE OF CAPITAL STOCK.—A certificate of the increase of capital stock of the Cherokee Flat Blue Gravel Mining Company, from \$65,000 to \$3,120,000, has been filed in the County Clerk's office. The certificate states that the amount of capital stock actually paid in is \$83,200, and that the liabilities of the Company are about \$500 for current expenses.

OUR "TRAVELLING CORRESPONDENT," Mr. L. P. McCarty leaves town on a trip this week and will within the next 90 days visit the following places in the State of Nevada: Battle Mountain, Galena, Palisade, Mineral Hill, Eureka, Hamilton Treasure City, Eberhardt, Mineral city, Schellhornne, Pioche, Anstin, Belmont, Reno, Virginia City, Gold Hill, Sutro, Carson, Silver City, Dayton, etc. He will also probably visit some of the prominent mining camps of Utah during his tour of observation. We hope our brethren of the press, as well as mining superintendents and others, will give Mr. McCarty a hearty welcome in their respective localities and assist him in obtaining the information he desires to publish. He will receive subscriptions for this journal during his trip and send us regular letters in relation to mining matters in the localities he visits. Mining Superintendents will oblige us and the mining community greatly, by affording him such facilities as are in their power.

MINING SALES.—We see by the Tribune, that during the month of May, several large sales of mining property were made in Salt Lake. Half of the "Emporia" mine, in Dry Cañon, Ophir District was sold by Godbe & Co., to Mr. B. Brady. The Northern Light, Fairview and Grizzly mines in Bingham Cañon, were sold to Michigan capitalists, for \$80,000 cash by B. F. Oliver, B. McManamin, J. E. Hutchings and Bell & Bateman. The Lottie, Hidden Treasure and Silver Hill mines, in the same locality, were also sold to Michigan capitalists, for \$50,000.

THE Pacific Wire Manufacturing Co., A. S. Hallidie, Agent, have recently removed from their quarters on California street to Nos. 113 and 115 Pine street, as will be seen by advertisement in another column.

San Francisco Metal Market.

WEDNESDAY, June 25, 1873.		
IRON.—		
Switch Pig Iron, 10 ton.....	\$22 00	@ 55 00
White Pig, 10 ton.....	32 00	@ 55 00
Refined Bar, 16 assortment, 10 lb.....	—	@ 05
Refined Bar, 60 assortment, 10 lb.....	—	@ 06
Sheet, No. 10 to 13.....	05 1/2	@ 07 1/2
Sheet, No. 14 to 20.....	05 1/2	@ 07 1/2
Sheet, No. 21 to 27.....	05 1/2	@ 07 1/2
Horse Shoes, per keg.....	9 00	@ 09
Nail Rod.....	11	@
Roller Iron.....	6 1/2	@
Other Irons for Blacksmiths, Miners, etc.	5 1/2	@ 9 1/2
COPPER.—		
Brass.....	35	@ 33
Copper, 10 lb.....	—	@ 25
O. N. Pat.....	55	@ 25
Sheathing, 10 lb.....	—	@ 29
Sheathing, 10 lb.....	23	@ 29
Sheathing, Old Yellow.....	23	@ 12 1/2
Composition Nails.....	29	@ 30
Composition Bolts.....	29	@ 30
TRY PLATES.—		
Plates, Charcoal, 10 lb box.....	14 50	@ 15
Plates, 10 Charcoal.....	13 50	@ 14
Roofing Plates.....	13 00	@ 13 50
Sheet Tin, 10 lb.....	40	@ 42 1/2
Steel, English Cast, 10 lb.....	20	@ 25
Drill.....	20	@
Flat Bar.....	22	@
Plough Point, 10 lb.....	10	@ 17
Russa (for mold beards).....	17	@ 15
Zinc.....	9 1/2	@ 10
Zinc, Sheet.....	8	@ 10
NAILS.—Assorted sizes.....	5 1/2	@ 9

Leather Market Report.

[Reported for the Press by Dolliver & Bro.]

SAN FRANCISCO, Wednesday, June 25, 1873. Trade in all kinds of stock has been exceedingly quiet and prices are the same, as a general rule. Money continues scarce, but an improvement is hoped for on the incoming harvest.

City Tanned Leather, 10 lb.....	26 00	@ 28
Santa Cruz Leather, 10 lb.....	26 00	@ 28
Country Leather, 10 lb.....	25 00	@ 26
Stockton Leather, 10 lb.....	26 00	@ 28
Jodot, 10 lb, 10 doz.....	50 00	@ 52 00
Jodot, 11 to 12 lb, per doz.....	50 00	@ 52 00
Jodot, second choice, 11 to 12 lb, 10 doz.....	55 00	@ 57 00
Levin, 12 and 13 lb, per doz.....	68 00	@ 70 00
Corneillean, 12 to 14 lb, 10 doz.....	65 00	@ 67 00
Corneillean Females, 12 to 13 lb.....	60 00	@ 62 00
Beaumontville, 15 lb.....	60 00	@ 62 00
Oregon, 15 lb, 10 doz.....	64 00	@ 66 00
Simon, 15 lb, 10 doz.....	69 00	@ 72 00
Simon, 20 lb, 10 doz.....	65 00	@ 67 00
Simon, 24 lb, 10 doz.....	72 00	@ 74 00
Robert, 10 lb, 10 doz.....	55 00	@ 57 00
French Kips, 10 lb.....	1 00	@ 1 30
California Kip, 10 lb.....	50 00	@ 52 00
French Sheep, all colors, 10 lb.....	9 00	@ 10 00
Eastern Calf for Backs, 10 lb.....	1 00	@ 1 25
Sheep Roans for Topping, all colors, 10 lb.....	9 00	@ 10 00
Sheep Roans for Linings, 10 lb.....	5 50	@ 6 00
French Calf, 10 lb.....	15 00	@ 16 00
Best Jodot Calf Boot Legs, 10 lb.....	75 00	@ 78 00
Good French Calf Boot Legs, 10 lb.....	4 50	@ 5 00
French Calf Boot Legs, 10 lb.....	4 00	@ 4 20
Harness Leather, 10 lb.....	30 00	@ 32 00
Fair Bridle Leather, 10 lb.....	45 00	@ 47 00
Skirting Leather, 10 lb.....	24 00	@ 26 00
Well Leather, 10 lb.....	30 00	@ 32 00
Wax Side Leather, 10 lb.....	21 00	@ 22 00
Wax Side Leather, 10 lb.....	17 00	@ 19 00
Eastern Wax Leather.....	28	@

Mineral Land Office.

The undersigned make the business of obtaining U. S. Patents for Mining Claims and Coal Land a specialty. We take cases in any part of the mineral region west of the Rocky Mountains, and in the Department of Washington. Special attention paid to contested cases. Mr. McKee has been for years Chief Clerk of the Mining Claims Division of the General Land Office at Washington, and has thorough knowledge of all the proceedings under the Mining Laws.

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Costing \$250,000, built chiefly of brick, iron and glass—complete in all its appointments for a first-class Exhibition of the Products of Industry and Art—will be in readiness by

SEPTEMBER 1st.

All Manufacturers, Artisans and Artists are cordially invited to avail themselves of this opportunity to place their Products before the People of the great North-West. The duration of the Exhibition will not be less than four, and probably six weeks. Applications for space, with brief statement of character of intended exhibit, addressed to the undersigned, will meet with prompt attention and reply.

JOHN P. REYNOLDS, Secretary,

87 Washington street, Chicago, Ill.

Jun 28-1t

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Mining and Other Companies.

Owing to the time necessary to mail the present large edition of the M. & S. Press, we are obliged to go to press on Thursday evening—which is the very latest hour we can receive advertisements.

Angels Quartz Mining Company—Principal place of business, 408 California street, San Francisco. Location of works, Angels Mining District, Calaveras County, California.

NOTICE.—There are delinquent upon the following described stock, on account of assessment (No. 35), levied March 4th, 1873, the several amounts set opposite the names of the respective shareholders as follows:

T D Mathewson.....	3	300	\$450 00
T D Mathewson.....	4	314	471 00
T D Mathewson.....	5	600	750 00
T D Mathewson.....	17	26	39 00
T D Mathewson (not issued)	325 5-7	438 57	
J H Fish.....	142 6-7	574 29	
J H Fish, Trustee.....	20	50	75 00
J H Fish, Trustee.....	21	50	75 00
J H Fish, Trustee.....	22	50	75 00
J H Fish, Trustee.....	23	50	75 00
Mrs E B Fish.....	9	1000	1500 00
R M Anthony.....	18	100	150 00
R M Anthony.....	19	45 5-7	68 57
R M Anthony.....	19	00	90 00
E H Sawyer.....	11	800	1200 00
E H Sawyer.....	(not issued)	228 4-7	342 86
Geo. Osgood.....	12	400	600 00
Geo. Osgood.....	(not issued)	142 6-7	171 43

And in accordance with law and an order made by the Board of Directors, on the 4th day of March, 1873, so many shares of each parcel of such stock as may be necessary, will be sold at public auction, at the office of Maurice Dore & Co., 327 Montgomery street, San Francisco, Cal., on Monday, April 21st, 1873, at 2 o'clock P. M., of such day, to pay said delinquent assessment thereon, together with costs of advertising and expenses of sale.

Office, Room No. 1, 408 California Street, San Francisco, California (up stairs). 45-3t

POSTPONEMENT.—Angels Quartz Mining Company. The above sale is hereby postponed for thirty days, at the same hour and place.

ap19 GEORGE CONGDON, Secretary.

POSTPONEMENT.—Angels Quartz Mining Company. The above sale is hereby postponed until Wednesday, June 18, 1873, at the same hour and place.

m17 GEORGE CONGDON, Secretary.

POSTPONEMENT.—Angels Quartz Mining Company. The above sale is hereby postponed until Wednesday, July 16, 1873, at the same hour and place.

j14 GEORGE CONGDON, Secretary.

Alpine Gold Mill and Mining Company.

Location of principal place of business, San Francisco, California.

NOTICE.—There are delinquent upon the following described stock, on account of assessment levied on the 13th day of May, 1873, the several amounts set opposite the names of the respective shareholders, as follows:

Name.	No. Certificate.	No. Shares.	Amount.
Felton, C. N.....	25	100	\$100 00
Ives, G. J.....	30	50	50 00
Luther, T. M.....	26	100	100 00
Richardson, E. A, Trustee.....	1	500	500 00
Richardson, E. A, Trustee.....	2	500	500 00
Richardson, E. A, Trustee.....	3	500	500 00
Richardson, E. A, Trustee.....	4	500	500 00
Richardson, E. A, Trustee.....	5	500	500 00
Richardson, E. A, Trustee.....	6	500	500 00
Richardson, E. A, Trustee.....	7	500	500 00
Richardson, E. A, Trustee.....	8	500	500 00
Richardson, E. A, Trustee.....	9	500	500 00
Richardson, E. A, Trustee.....	10	500	500 00
Richardson, E. A, Trustee.....	11	500	500 00
Richardson, E. A, Trustee.....	12	500	500 00
Richardson, E. A, Trustee.....	13	500	500 00
Richardson, E. A, Trustee.....	14	500	500 00
Richardson, E. A, Trustee.....	15	500	500 00
Richardson, E. A, Trustee.....	16	500	500 00
Richardson, E. A, Trustee.....	17	500	500 00
Richardson, E. A, Trustee.....	18	50	50 00
Richardson, E. A, Trustee.....	34	100	100 00
Richardson, E. A, Trustee.....	35	100	100 00
Richardson, E. A, Trustee.....	36	250	250 00
Richardson, E. A, Trustee.....	37	250	250 00
Richardson, E. A, Trustee.....	38	200	200 00

And in accordance with law, and an order of the Board of Directors, made on the 13th day of May, 1873, so many shares of each parcel of said stock as may be necessary, will be sold at public auction at the office of the Company, No. 438 California street, San Francisco, California, on the 9th day of July, 1873, at the hour of 1 o'clock P. M. of said day, to pay said delinquent assessment thereon, together with costs of advertising and expenses of sale.

JOEL F. LIGHTNER, Secretary.

Office, No. 438 California street, San Francisco, Cal.

Jun 21

Central Land Company—Office and Principal place of business, 338 Montgomery street, Room 5, San Francisco, California.

NOTICE.—There are delinquent upon the following described stock, on account of assessment levied on the 13th day of May, 1873, the several amounts set opposite the names of the respective shareholders, as follows:

Office, Room 14, No. 408 California street, San Francisco, Cal. J. W. TRILL, Secretary.

to the Secretary, at the office of the Company, 338 Montgomery street, Room 5, San Francisco, Cal. Any stock upon which this assessment shall remain unpaid on the 10th day of July, 1873, will be delinquent and advertised for sale at public auction, and unless payment is made before, will be sold on the 28th day of July, 1873, to pay the delinquent assessment, together with costs of advertising and expenses of sale.

Office, 338 Montgomery street, Room 5, San Francisco, June 10th, 1873. j15-d&e

California Beet Sugar Company—Principal place of business, San Francisco, California. Location of works, Alameda, Alameda County, California.

NOTICE.—There are delinquent upon the following described stock, on account of assessment (No. 2) levied on the 18th day of May, 1873, the several amounts set opposite the names of the respective shareholders, as follows:

Office, 314 California street, San Francisco, Cal. m29

Dutch Flat Blue Gravel Mining Company.

Place of business, San Francisco, Cal.

NOTICE.—There are delinquent upon the following described stock, on account of assessment (No. 2) levied on the 18th day of May, 1873, the several amounts set opposite the names of the respective shareholders, as follows:

Names	No. Certificate.	No. Shares.	Amount.
Booth, L. A.....	13	2000	\$1000
Booth, L. A.....	14	1000	500
Booth, L. A.....	15	1000	500
Cope, G. W, Trustee.....	67	100	50
Cope, G. W, Trustee.....	68	100	50
Cope, G. W, Trustee.....	69	100	50
Cope, G. W, Trustee.....	70	100	50
Dorsey, E. B.....	37	500	250
Dorsey, E. B.....	42	200	100
Dorsey, E. B.....	43	100	50
Dorsey, E. B.....	44	100	50
Dorsey, E. B.....	45	100	50
Dorsey, E. B.....	46	100	50
Dorsey, E. B.....	47	100	50

Bunker Hill Quartz Mining Company—Location of works, Amador County, California. Principal place of business, San Francisco, Cal. Notice is hereby given, that at a meeting of the Board of Directors, held on the 5th day of June, 1873, an assessment (No. 10) of Ten Dollars per share was levied upon the capital stock of the corporation, payable immediately in United States gold coin, to the Secretary, at his office, No. 19 First street, San Francisco, California. Any stock upon which this assessment shall remain unpaid on Monday, the 11th day of July, 1873, will be delinquent and advertised for sale at public auction, and unless payment is made before, will be sold on Monday, the 25th day of July, 1873, to pay the delinquent assessment, together with costs of advertising and expenses of sale. By order of the Directors.

SPECIAL NOTICE.—At a meeting of the Board of Directors of the Bunker Hill Quartz Mining Company, held this day, the assessment (No. 9) levied December 30, 1872, for Ten Dollars per share, was levied. Any stock upon which said assessment has been paid will be credited with the amount paid, upon Assessment No. 10.

CHARLES H. KNOX, Secretary pro tem.
San Francisco, June 5, 1873.

Lady Esten Tunnel and Mining Company. Principal place of business, No. 35 New Merchants' Exchange, San Francisco, California. Location of works, Little Cottonwood District, Utah Territory. Notice is hereby given, that at a meeting of the Board of Directors, held on the 11th day of June, 1873, an assessment (No. 3) of five cents per share was levied upon the capital stock of the corporation, payable immediately in United States gold coin, to the Secretary, No. 35 New Merchants' Exchange, San Francisco, Cal. Any stock upon which this assessment shall remain unpaid on the 15th day of July, 1873, will be delinquent, and advertised for sale at public auction, and unless payment is made before, will be sold on Wednesday, the 10th day of August, 1873, to pay the delinquent assessment, together with costs of advertising and expenses of sale.

CHAS. S. HEALY, Secretary.
Office, 35 New Merchants' Exchange, California street, San Francisco, California.

Manhattan Marble Company of California—Principal place of business, San Francisco. Location of works, Oakland, Cal. Notice is hereby given, that at a meeting of the Board of Directors, held on the 11th day of June, 1873, an assessment of one dollar per share was levied upon the capital stock of the corporation, payable immediately in United States gold coin, to the Secretary, at the office of the Company, 319 Pine street, San Francisco, California. Any stock upon which this assessment shall remain unpaid on the 24th day of July, 1873, will be delinquent, and advertised for sale at public auction, and unless payment is made before, will be sold on Monday, the 11th day of August, 1873, to pay the delinquent assessment, together with costs of advertising and expenses of sale.

D. M. BOKKE, Secretary.
Office, 319 Pine St., S. F., Cal.

Mansfield Gold Mining Company—Location of principal place of business, San Francisco, California.

NOTICE.—There are delinquent upon the following described stock, on account of assessment levied on the 8th day of May, 1873, the several amounts set opposite the names of the respective shareholders as follows:

Names.	No. Certificate.	No. Shares.	Amount.
Amos, H.	1	100	\$12 50
Austin, H.	2	100	12 50
Bruce, D.	3	100	12 50
Chester, H.	4	100	12 50
Dennis, John.	5	100	12 50
Fryer, Geo. H.	6	100	12 50
Gilbert, C. H.	7	100	12 50
Holman, G. C.	8	100	12 50
Ham, O. H.	9	100	12 50
Ham, O. H.	10	100	12 50
Ham, O. H.	11	100	12 50
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Ham, O. H.	248	100	12 50
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Ham, O. H.	250	100	12 50

WM. SMALL, Secretary.
Office, Room 14, No. 331 Kearny street, San Francisco, California.

Stanislaus Water Company—Location of principal place of business, 525 Kearny street, room 1, San Francisco. Location of works, near La Grange, Stanislaus County, California.

Notice is hereby given, that at a meeting of the Directors, held on the 24th day of June, 1873, an assessment (No. 1) of two cents per share was levied upon the capital stock of the Corporation, payable immediately in United States gold coin, to the Secretary, at the office of the Company, 525 Kearny street, San Francisco, California. Any stock upon which this assessment shall remain unpaid on the seventh day of July, 1873, will be delinquent and advertised for sale at public auction, and unless payment is made before, will be sold on the twenty-eighth day of July, at 1 o'clock P. M. 1873, to pay the delinquent assessment, together with costs of advertising and expenses of sale.

C. C. TRIPP, Secretary.
Office, 525 Kearny Street, Rooms 1 and 2, San Francisco.

Newton Booth Consolidated Mining Company—Location of principal place of business, San Francisco, California. Location of works, Ely Mining District, Lincoln County, Nevada. Notice is hereby given, that at a meeting of the Board of Directors, held on the 11th day of June, 1873, an assessment (No. 1) of five cents per share was levied upon the capital stock of the Corporation, payable immediately in United States gold coin, to the Secretary, at the office of the Company, 319 Pine street, San Francisco, California. Any stock upon which this assessment shall remain unpaid on the 15th day of July, 1873, will be delinquent, and advertised for sale at public auction, and unless payment is made before, will be sold on Monday, the 11th day of August, 1873, to pay the delinquent assessment, together

Machine Builders.

ESTABLISHED 1851.

PACIFIC IRON WORKS,

First and Fremont streets,

SAN FRANCISCO

RA P. HANKIN, A. P. BRAYTON,
GEO. W. FOGG, Superintendent.

Steam Engines and Boilers,

MARINE AND STATIONARY,

IRON AND BRASS CASTINGS

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And all other classes of work generally done at first-class establishments, manufactured by us at the lowest prices, and of the best quality.

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FULTON

Foundry and Iron Works.

HINCKLEY & CO.,

MANUFACTURERS OF

TEAM ENGINES,

Quartz, Flour and Saw Mills,

Wey's Improved Steam Pump, Brodie's Improved Crusher, Mining Pumps, Amalgamators, and all kinds of Machinery.

N. E. corner of Tehama and Fremont streets, above Howard street, San Francisco. 3-47

THE RISDON

Iron and Locomotive Works.

INCORPORATED.....APRIL 30, 1868.
CAPITAL.....\$1,000,000.

LOCATION OF WORKS:
Corner of Beale and Howard Streets,
SAN FRANCISCO.

Manufacturers of Steam Engines, Quartz and Flour Mill Machinery, Steam Boilers (Marine, Locomotive and Stationary), Marine Engines (High and Low Pressure). All kinds of light and heavy Castings at lowest prices. Gams and Tappets, with chilled faces, guaranteed 40 per cent. more durable than ordinary iron.

Directors:
Joseph Moore, O. J. Brenham, O. E. McLane,
Wm. Norris, Wm. H. Taylor, Lloyd Tevis,
James D. Walker.

WM. H. TAYLOR.....President
JOSEPH MOORE.....Vice-President and Superintendent
LEWIS B. MEAD.....Secretary
24v17-ay

UNION IRON WORKS, Sacramento.

ROOT, NEILSON & CO.,

MANUFACTURERS OF

STEAM ENGINES, BOILERS,

CROSS' PATENT BOILER FEEDER AND SEDIMENT COLLECTOR

Dunbar's Patent Self-Adjusting Steam Piston

PACKING, for new and old Cylinders.

And all kinds of Mining Machinery.

Front Street, between N and O streets,

SACRAMENTO CITY.

PACIFIC

Rolling Mill Company,

SAN FRANCISCO, CAL.

Established for the Manufacture of

RAILROAD AND OTHER IRON

Every Variety of Shafting.

Embracing ALL SIZES of

Steamboat Shafts, Cranks, Piston and Connecting Rods, and Locomotive Axles and Frames

HAMMERED IRON

Of every description and size

Orders addressed to PACIFIC ROLLING MILL COMPANY, P. O. box 2032, San Francisco, Cal., will receive prompt attention.

The highest price paid for Scrap Iron.

Mining Foundry and Machine Works,

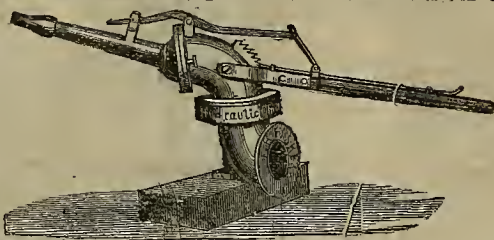
CO-OPERATIVE,

First Street, bet. Howard and Folsom, SAN FRANCISCO

Machinery and Castings of all kinds.

FISHER'S KNUCKLE JOINT AND NOZZLE

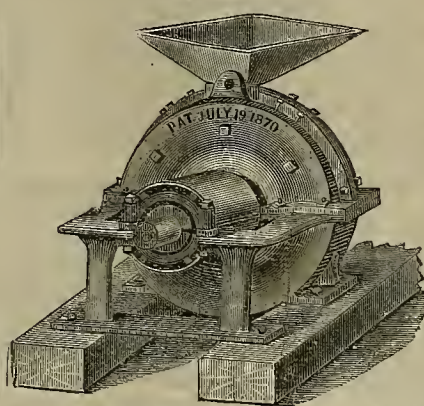
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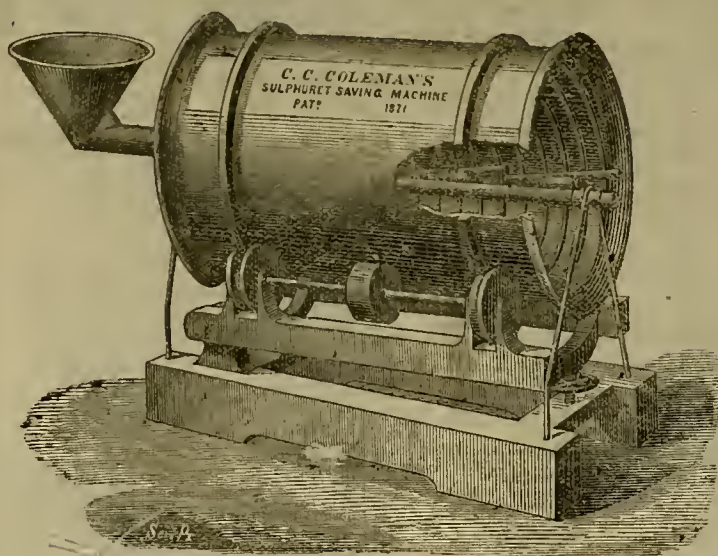
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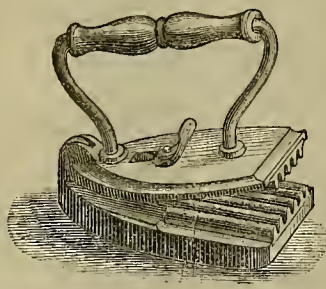
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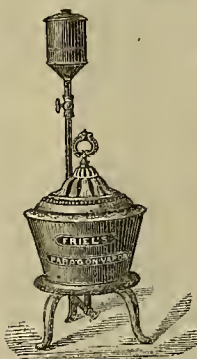


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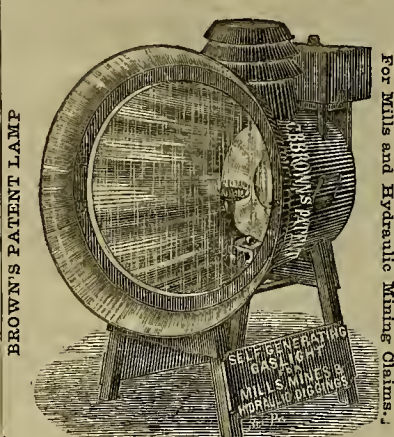


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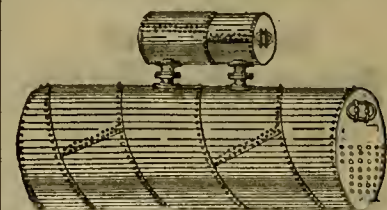
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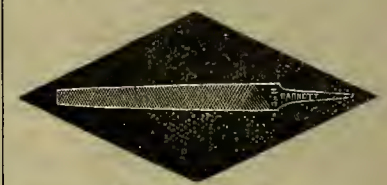
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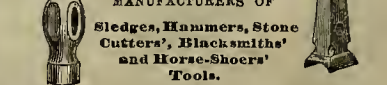
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